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ANTITRUST APPLIED: EXAMINING COMPETITION IN APP STORES

HEARING

BEFORE THE

SUBCOMMITTEE ON COMPETITION POLICY, ANTITRUST AND CONSUMER RIGHTS

OF THE

COMMITTEE ON THE JUDICIARY UNITED STATES SENATE

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

APRIL 21, 2021

Serial No. J–117–12

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ANTITRUST APPLIED: EXAMINING COMPETITION IN APP STORES

WEDNESDAY, APRIL 21, 2021

UNITED STATES SENATE,
SUBCOMMITTEE ON THE COMPETITION POLICY,
ANTITRUST, AND CONSUMER RIGHTS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:30 p.m., in Room 226, Dirksen Senate Office Building, Hon. Amy Klobuchar, Chair of the Subcommittee, presiding.

Present: Senators Klobuchar [presiding], Blumenthal, Ossoff, Lee, Hawley, and Blackburn.

OPENING STATEMENT OF HON. AMY KLOBUCHAR, A U.S. SENATOR FROM THE STATE OF MINNESOTA

Chair KLOBUCHAR. Good afternoon, everyone. Sorry we are a little late, but we had a vote this afternoon. Thank you, Senator Lee, for working with me and our two staffs together on this hearing. I call to order this hearing of the Subcommittee on Competition Policy, Antitrust, and Consumer Rights. The title of this hearing is "Antitrust Applied: Examining Competition in App Stores." I welcome our witnesses.

In our hearing, we are going to examine the scope of America's monopoly problem and discuss what should be done to protect and foster competition in the 21st century. Today we will focus on competition in what we call the app economy. We will discuss competition relating to the mobile applications that run on our smart phones, including revenues generated through app sales and in app purchases, we, well as app related ad revenues and sales of devices designed to run apps.

In 2020, global app revenues have been estimated at more than $580 billion and they are projected to grow to more than $900 billion by 2023. In just the first 3 months of this year, users are estimated to have spent $21 billion on apps from Apple's App Store and around $11 billion on apps from Google's Play store. Those are billions, not millions, and that is 40 percent higher than last year. This is a huge business and it is growing and it is growing fast. There is nothing wrong with that, but what is wrong is if we do not have competition.

Users spend about 90 percent of their smart phone internet time on apps. Consumers cannot get the same functionality from a webpage as they can from an app. When you are tweeting or browsing the web or mapping your location or looking at a newsfeed or listening to music, you are almost always using an

app. To put things in perspective, in the first 3 months of this year, Americans spent an average of more than 4 hours a day, Senator Lee, on mobile apps. Do you think you were higher or lower?

Senator LEE. I plead the Fifth.

Chair KLOBUCHAR. Okay. Practically all of the apps used by consumers today are either preinstalled on Apple devices or devices running Google's Android operating system or downloaded from Apple's App Store or Google's Play store depending on the consumer's device. Apps designed for the iPhone cannot run on an Android device and Android apps cannot run on an Apple device. There are two separate app ecosystems, Apple's and Google's, with each setting all the rules and extracting commissions. And consumers choose which ecosystem they want to use when they buy their smartphone. If they buy an iPhone, they are with Apple for as long as they use that phone. If they buy an Android phone, they are with Google for the life of that phone.

As consumers do not replace smartphones very often because they are so expensive, app developers who want to reach consumers on both types of phone must create two versions of their apps, one for Apple and one for Android. The only practical way for app developers to reach those customers is with the permission of Apple or Google. Unless you are some kind of computer hacker, which we hope you are not, the only way to download an app onto your iPhone is through the Apple App Store. No other app stores are allowed and downloading apps directly from the internet to avoid the app store, a process known as sideloading, is prohibited by Apple. In every sense, it is what we call a walled garden and by design, the App Store has a literal monopoly on the distribution of apps on Apple devices.

While Google does allow alternative app stores and sideloading on Android, as a practical matter, the overwhelming majority of app downloads take place on the Google Play Store, making it by far the dominant app store on Android devices.

Both Apple and Google maintain strict control over their app stores. They decide which apps can or cannot exist on their app stores and set the rules for how apps operate once they are downloaded. As a result, Apple and Google operate as gatekeepers with the power to decide how or whether apps can reach iPhone and Android users. At the same time, they offer many apps that compete directly with those sold through their own app stores. Of course, this gatekeeper power can and often is used to provide a secure environment in which legitimate apps can be distributed to consumers. Today we will focus on how Apple and Google can use their power to: (1) exclude or suppress apps that compete with their own products; and (2) charge excessive fees that affect competition in the app economy.

As I have said before, just because a company creates a successful, innovative business that consumers like does not give it a free pass to harm competition or ignore our antitrust laws. Both companies also offer their own apps that compete with the third party apps in their app stores, including video streaming apps, music apps, payment apps, gaming apps, and more. In some cases, Apple and Google can build the functionality of a third party app into their operating system or build an app that is essentially a copy.

Apple's App Store terms explicitly allow them to imitate any of the apps in their store, a practice known as "sure locking," which can render the original competing app obsolete.

Both companies also compel app providers that sell digital content or services in their app to use their payment process services. The companies then charge commissions of up to 30 percent—that is right—thirty percent for such in-app purchases. The apps are not allowed, and this is something that people do not know, to inform customers of or link to payment methods outside of the app to avoid the commission. In other words, consumers are banned from finding out, if they are in the app, that they have a cheaper alternative.

Of course, we acknowledge that most apps are not subject to these commissions. Most small developers and most who offer apps that sell physical goods or services that will be consumed outside the app like rides on Uber do not pay the commission and they are probably pretty happy about that. That is fine. Focusing high commission on apps that charge for digital services used on the iPhone ensures that the commissions target the very apps that are most likely to compete directly with Apple's and Google's own offerings. Some affected app developers are complaining that being forced to use these payment services with their high commissions are crippling their ability to compete with Apple and Google products on equal terms.

Just because most developers are happy because they are not paying commissions, that is fine, it does not inoculate the app stores from the antitrust laws if they are harming competition with other developers. Some developers have also raised concerns about the app store's ability to demote their placement in app store rankings, to banish their apps from the app store, to withhold or delay approval of app updates which can limit app functionality, and to set their own products as automatic defaults. And when we talk about incentives, it is important to remember that the app stores are not supporting businesses that just cover the cost of operating them.

In 2020, consumers are estimated to have spent $72.3 billion in Apple's App Store and $38.6 billion in Google's Play Store. Applying their standard commission rates to these amounts nets Apple and Google billions of dollars. These concerns have attracted the attention of enforcers in America and around the world. We have seen significant reports on this issue from governments in Europe and Australia in addition to the House Antitrust Subcommittee's Digital Markets Report. There have also been news reports of investigations by the Justice Department and State attorneys general into app store competition. State lawmakers in Arizona, Massachusetts, North Dakota, my home State, Minnesota, and other States have proposed legislation to regulate app stores.

Although we can and should use our existing antitrust laws to address these issues, we can also strengthen our laws, including with my bill, the Competition and Antitrust Law Enforcement Reform Act and the exclusionary portions of that bill would be very helpful in taking on these cases.

We also have to make sure that the agencies have the resources to take on these complex matters which have taken me quite a few

minutes to even get to the guts of explaining this, but I thought it was really important to do. You can imagine if you are actually taking on the world's biggest companies that we have ever known in the world, you actually have to be able to have the resources to do that. That is actually tied in with this as are all antitrust matters before those agencies. They have to have the resources. They just cannot do this with duct tape and band aids.

We all appreciate app stores and the roles that Apple and Google have played in helping to create many of the technologies that have defined our age. That is great. We are not angry about success. We simply want to make sure that capitalism keeps going in a strong, strong way that is fair to everyone, yes. Capitalism is about competition. It is about new products coming on. It is about new competitors emerging. This situation, to me, does not seem like that is happening when you have two companies really each dominating in different areas and when you have companies that are simply trying to do business in their own ecosystems or maybe with Apple and Google that are severely hampered from doing it.

With that, I turn it over to Ranking Member Lee and I look forward to hearing from the witnesses.

OPENING STATEMENT OF HON. MICHAEL S. LEE, A U.S. SENATOR FROM THE STATE OF ARIZONA

Senator LEE. Thanks so much, Chairwoman Klobuchar, and thanks for holding this hearing. Thanks to all of you for being here today.

The subject of today's hearing, as our Chairwoman has just indicated, is an incredibly important one. For better or for worse, our smartphones have come to dominate our social and economic lives and apps are increasingly becoming the most popular way to use those devices to communicate, in many cases to make purchases, stay informed, and otherwise manage our day-to-day affairs.

The power that Google, Apple, and few other large tech companies hold over the way Americans live their lives is itself simply unprecedented. Legislators on both sides of the aisle are right to be concerned and right to be interested in inquiring into some of these issues.

One recent example of this power involved the total deplatforming of Parler in January. In a matter of days, both Apple and Google removed Parler from their app stores just as Amazon pulled the plug on Parler's web servers. They did this despite Parler's close collaboration with the FBI in advance of the January 6th events in order to flag potential events and in spite of the much greater prevalence of planning of the horrible events of January 6th on Facebook, on Instagram, and on Twitter. Both of those apps and their owners, Facebook and Instagram being under one ownership and Twitter another, those apps remained. Those apps, you know, were allowed to stay on while Parler, disfavored by the wilk barons of Silicon Valley was just taken down. Millions of voices went silent and one potential avenue for competition in this marketplace for social media platforms just disappeared into thin air.

I found this troubling. Not just because this was one company that was taken down, but because of the many millions of people

who had chosen to use Parler were also effectively silenced in that. I found it very difficult to get good, clear answers or any persuasive answers as to what warranted this action other than that they could and other than that they were not happy with certain things that happened. Those answers did not meaningfully distinguish Parler from other social media sites or from other apps.

I engaged with both Apple and Parler almost immediately to try to get to the bottom of this and why it was happening. Apple's story seemed to change somewhat over the course of our discussions, but I will give Apple and do give Apple credit for continuing to work with Parler and eventually reaching a resolution that should see Parler return to the app store within coming days. All eyes now turn to Google and to Amazon to see what they will do. So, like I say, I am very pleased with this outcome, but I am as pleased with the outcome in many ways as I am very dismayed that it took 3½ months and the intervention of a United States Senator in order to get there. It is dumbfounding to me. These are not the actions of companies that feel like they have meaningful competition.

I want to be clear. This is concerning. I am glad they were able to resolve this issue to the extent necessary to get Parler back on the app store in the coming days, but it does make me wonder a number of things. How many small businesses—and let us be clear, that is what many apps start out as. In fact, most, nearly all, start out as small businesses. How many small businesses flounder and die because of potentially pretextual restrictions imposed on them arbitrarily by app store gatekeepers? How many of them? How many never get off the ground? We may never know the true cost of competition and the cost to competition itself and to innovation and to consumers.

I also want to be clear that Parler's deplatforming was itself not as far as I can tell an antitrust violation, but it might be symptomatic of the immense market power held by a handful of tech companies including Apple and Google and Amazon and others. When we see this kind of market power being used in harmful, if legal ways, it is only fair to ask whether it is also being used in illegal ways that might harm competition. Sometimes this is what raises the first flags. If you see someone acting with wanton disregard for competitive forces that might otherwise come into play, what else could be out there? If Big Tech is going to take a side in the culture wars or in political conversations, Big Tech should be prepared for the greater scrutiny that will come with that unfortunate choice and with that harmful choice.

With this in mind, I am real excited to participate in today's hearing and to get to the bottom of this really pressing question. Thank you.

Chair KLOBUCHAR. Thank you very much, Ranking Member Lee. I want to introduce our witnesses. Our first witness today is Kyle Andeer. Mr. Andeer is the chief compliance officer and vice-president of corporate law at Apple. Earlier in his career, he was an attorney at both the Federal Trade Commission and the Antitrust Division of the Department of Justice.

Our second witness will be Wilson White. Mr. White is a public policy and government relations senior counsel on Google's Moun-

tain View policy team where he is the global public policy lead for the Android, Google Play Payments Communications, and Hardware businesses. He also leads on the company's global policy strategy for emerging tech issues including artificial intelligence, virtual reality, and the internet of things.

Our third witness is Dr. Mark Cooper. Dr. Cooper is director of research at the Consumer Federation of America where he has responsibility for energy, telecommunications, and economic policy analysis. He holds a PhD from Yale and is a former Yale and Fulbright Fellow. He is the author of five books and numerous articles.

Next will be Mr. Horacio Gutierrez. Mr. Gutierrez is the general counselor and vice-president of business and legal affairs at Spotify. He is responsible for overseeing Spotify's global, legal, regulatory, and government affairs and serves as corporate secretary to its board of directors. In addition, he heads Spotify's Global Licensing Operations, a business function responsible for commercial licensing activities with record labels, music publishers, performance rights, and other right holders worldwide.

Our fifth witness is Kristen Daru. Ms. Daru is the general counsel, corporate secretary, and chief privacy officer of Tile, Inc. She manages legal and government affairs as well as privacy for Tile and serves on its executive leadership team. Kristen started her career as a commercial litigator with a focus on consumer protection and antitrust defense. Most recently prior to Tile, she was chief privacy officer of Electronic Arts.

Our final witness is Jared Sine. Mr. Sine currently serves as the chief legal officer and secretary of Match Group where he is responsible for all legal compliance and government affairs functions for Match Group on a global basis. Prior to joining Match Group, he worked for Expedia as vice-president associate general counsel where he oversaw all legal aspects of Expedia's mergers, acquisitions, joint ventures.

I want to thank the witnesses for appearing today and I look forward to hearing your testimony. If the witnesses now could stand and raise your right hand, including our remote witnesses.

Do you swear that the testimony you will give before the Subcommittee will be the truth, the whole truth, and nothing but the truth so help you God?

WITNESSES. I do.

[Witnesses are sworn in.]

Chair KLOBUCHAR. Thank you. You will be seated and we will begin with you, Mr. Andeer, for a 5-minute testimony. Thank you very much and thank you for appearing remotely.

STATEMENT OF KYLE ANDEER, CHIEF COMPLIANCE OFFICER, APPLE, CUPERTINO, CALIFORNIA

Mr. ANDEER. Chairwoman Klobuchar, Ranking Member Lee, and Members of the Subcommittee, my name is Kyle Andeer, and I am Apple's chief compliance officer. I appreciate the opportunity to offer testimony about Apple's App Store.

Some of you may have an iPhone with you right now. I hope that is the case because we believe our products deliver the best possible customer experience. To do that, we work constantly to innovate. The App Store is one of our most important innovations. It

is a critical feature of iPhone, providing customers access to nearly two million apps, allowing you to hail a ride, order dinner, listen to music, and so much more, all from your iPhone.

Amazing as that is for our customers, I think the App Store's real success is the opportunity it has created for software developers to build and distribute all those apps in the first place. Today an entrepreneur with a great idea can use the App Store to build an app and instantly reach customers across the entire world all from her home. It is easy to take that for granted, but it was not always this way. When we introduced the App Store in 2008, creating software was difficult and often expensive. Developers had to pay for the tools they needed to build and test their products. Then they had to distribute it, either over the internet, which had trust and security issues, or through physical disks, which require costly shelf space in brick and mortar stores. It is a little wonder that options were fairly limited and expensive back then. The App Store changed all of that. It truly revolutionized software distribution.

First, the App Store is curated. iPhone is not just a phone. It contains some of your most sensitive information—photos of your kids, financial and health information, and the controls to your home security system. And because of that, bad actors from around the world try to infiltrate devices using malware. That is like a Trojan horse that tries to get into your phone and wreak havoc. We will not tolerate that. We review every app in the App Store to make sure it meets standards for privacy, safety, security, and performance. Each week, we review about 100,000 submissions and we reject about 40 percent of them because they do not meet those standards. We know that our approach works. Study after study shows that the iPhone has fewer malware infections than any other device in the marketplace.

Second, we have invested significantly to provide developers the tools that they need to build apps. That includes over 250,000 application programming interfaces that help unlock the magic of the iPhone. Because of that, a developer can build apps that let you deposit a check by taking a picture of it, play a game or listen to music with iPhone's audio and video technologies, or get directions using GPS. Apple built those and so many other capabilities into iPhone and now developers can leverage them for their apps.

The App Store is not just a store. It is like a studio stocked with canvasses, brushes, and paint, the tools that artists need to create their works. It is a gallery where they can display and sell their creations. That is how the App Store empowers everyone to build apps, from elementary school kids to small businesses, not just the big guys.

Third, the App Store is a great value for developers. The developer keeps 100 percent of the money she makes for the vast majority of apps on the App Store, about 85 percent of them. The commission charged to other developers, those selling digital goods, initially was set at 30 percent, which is a competitive rate today and a far cry from the rates charged for software distribution when the App Store was launched 12 years ago. Since then, we have never raised the commission. We have always lowered it, as we did against last year for small businesses. Today the commission is almost always just 15 percent in those instances when it is required.

We are proud of the store we have built, the jobs it has created, and the economic opportunity it has supported. It is the sort of thing that is possible when competition is fierce and fair. Apple, after all, was started by tinkerers and dreamers and we became successful over time because we had an opportunity to compete. We were in a street fight back then and we still are today. We like it that way because we know that competition spurs innovation, and with it, more and better choices for customers.

Thank you for the opportunity to participate today and I am happy to answer any questions you might have.

[The prepared statement of Mr. Andeer appears as a submission for the record.]

Chair KLOBUCHAR. Thank you very much, Mr. Andeer.

Next, Mr. White with Google.

STATEMENT OF WILSON WHITE, SENIOR DIRECTOR PUBLIC POLICY & GOVERNMENT RELATIONS, GOOGLE, INC. MOUNTAIN VIEW, CALIFORNIA

Mr. WHITE. Chairwoman Klobuchar, Ranking Member Lee, and distinguished Senators of the Committee, thank you for inviting me here today to discuss the Google Play ecosystem and the benefits it provides to millions of American consumers and developers.

My name is Wilson White and I am a senior director on the Government Affairs & Public Policy team at Google. In my testimony today, I will describe: (1) how Android and Google Play work; (2) the ways in which they have contributed to competition and choice; and (3) how we fund and sustain the continued evolution of Android and Google Play while helping developers and consumers.

First, at Google, we believe that everyone should have equal access to the benefits of mobile devices and we designed Android and Google Play with freedom, openness, and accessibility in mind. Since Android is an open source operating system anyone, including competitors, are free to use it without any requirement to preinstall or download Google's apps or other services. Thousands of companies including Peloton and JetBlue's in-flight entertainment system use the Android operating system to build their technologies and their businesses. Device makers and carriers are free to use Android without Google Play or Google's other services. Many of them actually choose to preload Google's apps alongside their competing apps. In fact, more than half of Android devices come preinstalled with more than one app store. This openness has proven enormously valuable to device makers because it allows them to invest in other ways, innovate in other ways, without having to devote resources to building an operating system.

Similarly, the availability of third-party software is important to ensure that mobile devices meet consumer's expectations. A consumer selecting between competing mobile devices needs to understand whether their favorite apps and games will be available and actually work on those devices. That is where app stores come in.

In 2012, we launched Google Play as our vision for an ideal Android app store. We have a consumer experience, an online storefront where consumers come to find their best apps and games and a developer experience with app development, distribution, commerce, and performance analysis tools that help developers build

better apps and to grow their businesses. Through freedom, openness, and accessibility, today Android and Google Play are the foundation of a thriving and competitive device and app ecosystem. Android is available on 2.5 billion devices around the world. Google Play has 2 billion 30-day active users. Millions of companies rely on these platforms to reach consumers around the globe.

Second, Android has increased competition and choice across the ecosystem. Because of Android, today a consumer selecting a mobile device is not limited to one or two or even a handful of alternatives. More than 1,300 companies build Android devices and there are more than 24,000 different Android device models to choose from. Some of these Android devices cost less than 100 bucks, which has made computing more accessible to communities that have not been well-served by the tech platforms in the past.

Third, our business only succeeds when our developer partners succeed and consumers view us as a trusted destination for digital content. More than 90 percent of the apps on the Google Play store are free to consumers. We do not charge for the range of services that Google Play provides unless it results in a sale of digital content for a developer. Even then, only if that sale occurs within the app itself. We believe this business model supports entry and innovation.

When our standard fee does apply, it covers everything from essential security updates, managing app installs, and a vast array of developer tools to help developers build and to maintain a global marketplace. It also reflects the investment that we make in the platform itself. For example, we employ approximately 9,000 people who are dedicated to Android and Google Play. This fee is also competitive with industry practices that existed long before Google Play was built. Many PC and console, physical and other app stores charge similar fees. Just a few weeks ago, we announced that we were reducing the fee to 15 percent on the first $1 million that all developers earn on Google Play, regardless of those developers' sizes.

With this change, 99 percent of developers will see a 50 percent reduction in their service fees. We believe the value proposition for Google Play is a strong one. If a developer does not agree that the value proposition is adequate, the openness of Android allows those developers options to display and distribute their apps through other means, either directly to consumers or via other app stores. Creating a global platform with access to all and providing tools for developers has always been our goal since we launched the very first Android device. We are proud that our bet on openness has resulted in success for all involved.

We appreciate the Committee's interest in these important issues and I look forward to answering your questions.

[The prepared statement of Mr. White appears as a submission for the record.]

Chair KLOBUCHAR. Thank you very much, Mr. White. Next up, Dr. Cooper.

STATEMENT OF MARK COOPER, PH.D.,
DIRECTOR OF RESEARCH, CONSUMER FEDERATION OF AMERICA, WASHINGTON, DC

Dr. COOPER. Madam Chairwoman, Members of the Committee, my name is Dr. Mark Cooper. I am director of research at the Consumer Federation of America. We appreciate the opportunity to testify today. This may be the most important effort to reform antitrust in the four decades that I have been analyzing it for the CFA. I draw on three articles in my comments which I have submitted for the record. They outline the problem which remarkably the Chairwoman's description of the practices were all illegal in the Microsoft case. That is the standard that we should be applying today and enforcing.

Digital communications is dominated by platforms using and abusing market power to undermine competition. Six years ago, we concluded that one primary goal of public policy in a dynamic digital economy is to ensure that market power that is inherent in platforms does not hinder or diminish the competition for goods and services and applications that can ride on those platforms. We have the model in hand, bright lines behind which entrepreneurial experimentation is unleashed and strong antitrust principles to constrain market power.

The great challenge, of course, is where do you draw that line. How do you find a set of policies that recognize that there are innovative companies developing platforms and there are competitors who would like to develop applications?

We know that companies are innovative and these companies here and on the tv are innovative. They are seeking innovative rents, sometimes called Schumpeterian rents because they disrupt business and they create needs and wants that they then meet in increasingly consumer-friendly ways. However, there tends to come a point in the development of these industries where instead of chasing Schumpeterian rents, they begin to chase what I call Rockefeller rents. Those are the rents that accrue to firms that build bigger moats around their businesses and lock consumers in while they lock competitors out.

An analysis by the Stigler Group Center at University of Chicago lists three dozen challenges to antitrust in the digital age. The irony is that the first 10 represent positive economic benefits of digital production and distribution. Those are the innovations we need to foster, but the existence of those innovations does not justify the two dozen anticompetitive sets of practices that have grown up around them.

Congress should, in fact, set goals, provide authority, give power and resources to the expert agencies. Under close congressional oversight, the agencies will get the job right. However, if Congress tries to draw lines and pick winners and losers, there is a good chance that the winner they pick today will be a loser tomorrow and then we have to get Congress to act again. That is not so easy to do. Congress should clear away the thicket of mergers and abusive practices, the decades of antitrust malpractice, and shift direction. It should put all of the suspect practices and mergers on the table and empower the agencies to figure out who is doing what to whom and quickly resolve those problems.

The specifics that I support in my testimony include the following: nondiscriminatory interconnection and carriage which equals open application interfaces in the digital economy, deep suspicion of proprietary application interfaces, a presumption that they are illegal and severe risk to those platforms that rely on proprietary interfaces. Fair, reasonable, and nondiscriminatory rates, terms, and conditions for access. That's FRAND, an expression you will hear in antitrust. The demand side is as important as the supply side. If we cannot get the customers, it does not matter how many apps we can develop as long as if we cannot win the business. We need to have the equivalent, which is true consumer sovereignty on the demand side.

Consumers must have opted in, not opted out. No presumption of what the default is. Give me the chance to choose. Equal single click choice. Provision of neutral information. Clear description of the information that is collected and how it is used. Some limitations on the types of informations collected and the targeting of groups for that information. Those are the principles, approximately ten principles, that need to govern this space if it is going to be consumer-friendly and competitive.

Thank you.

[The prepared statement of Dr. Cooper appears as a submission for the record.]

Chair KLOBUCHAR. Thank you very much, Dr. Cooper. Next, Mr. Gutierrez.

STATEMENT OF HORACIO GUTIERREZ, HEAD OF GLOBAL AFFAIRS & CHIEF LEGAL OFFICER, SPOTIFY, NEW YORK, NEW YORK

Mr. GUTIERREZ. Chairwoman Klobuchar, Ranking Member Lee, and Members of the Subcommittee, thank you for the opportunity to testify today on behalf of Spotify.

My message is simple, stark, and urgent. We believe all businesses including Spotify should work hard to earn the favor of consumers through fair and square competition in the marketplace based on better, more innovative products offered at attractive prices. Apple abuses its dominant position as the gatekeeper of the App Store to insulate itself from competition and disadvantage rival services like Spotify. Apple's anti-competitive conduct hurts consumers with higher prices, less innovation, and less choice.

Our market moves at internet speed and legislative action is urgently needed to give antitrust enforcement agencies the tools they need to prevent gatekeeper platforms like Apple from abusing the power of their platform. Unless decisive legislative and enforcement action is taken, other gatekeeper platforms inevitably will follow Apple's example resulting in further concentration of power in the hands of a handful of digital sovereigns.

Fifteen years ago, Spotify pioneered a streaming audio service that today enables our 345 million customers to hear the music and podcasts they want anywhere at any time. Apple Music is one of our principle competitors. Its advantage is not better service. Instead, it is Apple's total control over the App Store, which allows them to impose rules that disadvantage Spotify and benefits Apple's own service.

Some may not remember this, but iPhones were not that popular when first introduced. Apple soon realized that the iPhone would not succeed if it only offered Apple's proprietary apps. It invited third-parties to develop apps for the iPhone and opened the App Store. Apple, therefore, has things exactly backward when it claims that companies like Spotify are free riding on Apple's innovations. It is Apple's success that rode, in large part, on the creativity of third-party app developers that created demand for Apple's devices. And the proof is Apple's own slogan, "there's an app for that," which is used to drive sales of Apple devices.

How did Apple show its gratitude for app developers' help? By doing a classic bait-and-switch. They waited until tens of millions of device owners were locked into the iPhone before changing the App Store rules to impose burdens on app developers that compete with Apple's own applications. Apple has a decade long history of using App Store policies to handicap Spotify and benefit Apple Music. It forced us to choose between two bad options: accepting Apple's illegal tie of its proprietary payment system and paying Apple's 30 percent tax, which would have forced us to raise consumer prices and made our service more expensive than Apple Music, or accept a gag order, prohibiting our communication with our own customers so that we cannot tell our users about the existence of our premium service and discounts and promotions available to first time subscribers.

It does not take a Ph.D. in economics to recognize that this abuse of conduct hurts consumers by depriving them of information about a product that competes with Apple's. Apple's anticompetitive intent is clear from the fact that it targets businesses that are or might become Apple's competitors in downstream markets. The rules apply to companies that offer online gaming, music and video streaming, access to ebooks, but companies like Uber, Starbucks, Ticketmaster, and Walmart are exempt.

Apple argues that these rules are indispensable to the safety and privacy of users, but how can they be indispensable when they do not even apply to 85 percent of the apps in the App Store that are exempt from Apple's "restrictions?" Apple's explanations are cynical pretexts. These restrictions are nothing more than an abusive power grab and a confiscation of the value created by others. Even Microsoft in the heyday of the Windows PC operating system did not demand a cut of 30 percent of the revenues of competing browsers and media players.

Legislative action is urgently needed to stop these illegal power grabs. We welcome the broad antitrust reform proposed by Chairwoman Klobuchar along with Senators Blumenthal and Booker. Senator Hawley recently proposed a bill with a number of similar and very important reforms. These reforms are essential to equip enforcement agencies with the tools they need to remedy the market and consumer harms that result from these platform abuses.

Thank you and I look forward to answering your questions.

[The prepared statement of Mr. Gutierrez appears as a submission for the record.]

Chair KLOBUCHAR. Very good. Thank you very much. Ms. Daru.

STATEMENT OF KRISTEN DARU,
GENERAL COUNSEL, TILE, INC.,
SAN MATEO, CALIFORNIA

Ms. DARU. Thank you to the Subcommittee and to your dedicated staff for convening this critical hearing. My name is Kristen Daru, and I am the general counsel of Tile.

Tile helps people find lost items. Our devices work with the Tile app to help people find their keys, wallet, purse, really anything. We also embed our technology into third-party products like headphones, laptops, and wearables. We are a small company with only—with less than 150 employees, but we have pioneered this category and found success even in the face of significant competition ranging from other start-ups to Fortune 50 companies.

Much of our success relates both to world class features and a commitment to both privacy and importantly, interoperability. We believe consumers should have a seamless finding experience across any platform including Android and iPhone.

Originally, we had a symbiotic relationship with Apple. We launched our iOS app in 2013. They sold our devices in their retail stores and they even featured us on stage at their worldwide developer conference in 2018. That all changed when Apple decided that it wanted to take over this category. To be clear, we welcome competition, but it has to be fair competition. Apple's idea of competing is patently unfair and I will give you some examples.

With iOS 13, Apple introduced a new FindMy app that had Tile features. It is basically their version of Tile. FindMy is installed by default on all iPhones. At the exact same time, Apple made changes to its operating system that denigrated our user experience and made it really hard for our customers to activate their Tiles, but they left FindMy streamlined and on by default. Apple reserved troves of critical information for use exclusively in FindMy and not competing apps.

Of course, yesterday, Apple announced the launch of their competing hardware product, the AirTag. AirTags will make use of a technology called ultrawide band, or UWB. It is a nonproprietary technology in the same way that Bluetooth is. Whereas Bluetooth can tell you in what room your item is located, UWB can tell you exactly what pillow it is under. Apple first included UWB chips in its iPhone 12, and since 2019, we have made many requests to access that chip so that we can use it for the benefit of our customers.

In fact, we made an amazing experience using augmented reality with UWB where you can use your phone and see exactly where in the room, what pillow your keys are located under. Apple refused our requests and therefore we cannot bring that innovation to the market for the benefit of our customers. Yet, the AirTag is going to use UWB because Apple has decided to reserve its use exclusively in its product.

If that were not enough, 2 weeks ago Apple confirmed that it is about to go live with something called the FindMy Network Accessory Program, which the House has already found to be anti-competitive. The program was originally touted in the media as a pro-competitive concession to Tile's concerns, giving our customers access to the troves of location data otherwise reserved for FindMy. Not so. In order for our customers to get that benefit, we have to

give Apple unprecedented control over our business and direct our customers to the FindMy App to find their lost items. Basically, the FindMy program holds critical data hostage to coerce developers like Tile to abandon our apps and our networks. It deprives customers of choice and importantly, it breaks our interoperability.

This is not surprising. In the Epic litigation, an Apple employee named FindMy Friends as part of an Apple strategy to decrease interoperability to lock customers into its ecosystem. It seems as though FindMy is part of Apple's ongoing plan to turn iOS to a Hotel California where you can check in anytime you like, but you can never leave. It is working. One of our competitors has actually announced that its newest devices will be available exclusively within FindMy to the exclusion of its own app.

Apple, of course, claims that all of these actions are necessary in the name of privacy. That is not true. Privacy and fair competition are not mutually exclusive. Apple could easily define requirements to allow us all to play on the same field, but Apple does not do that. Apple uses privacy as a blanket excuse to subject competitors to different rules. This is what happens when you have a monopolist acting as a de facto regulator. The regulations will always favor the monopolist. If Apple turned on us, it can turn on anyone. Apple has demonstrated it will not change unless someone makes them.

The legislative answer is simple. If Apple chooses to compete against developers on its platform, it should just do so fairly and according to the same rules. Regulating a giant like Apple will not be easy, but it is just going to get harder as it gets bigger and more powerful. Starting with an App Store antitrust reform bill to address some of these known abuses will be an important first step to ensure lasting innovation and competition in this country.

Thank you for your time.

[The prepared statement of Ms. Daru appears as a submission for the record.]

Chair KLOBUCHAR. Thank you very much.

Next, Mr. Sine. Last, but not least. Thank you.

STATEMENT OF JARED SINE,
CHIEF LEGAL OFFICER & SECRETARY,
MATCH GROUP, INC., DALLAS, TEXAS

Mr. SINE. Madam Chair, Ranking Member Lee, and Members of the Committee, thank you for your bold leadership in advancing this important public debate. Apple and Google have used their monopoly power to redirect the meritocracy of the free, competitive, and innovating information superhighway to run primarily through the toll gates of their app store monopolies. They have systematically programmed users to seek out the app for that, and if you do not have an app, you might as well not exist.

Let me be clear. Apple and Google are the only gatekeepers of this new internet, using user data and app developer's innovations and even income against them in order to bankroll the construction of massive tollways on the formerly free information superhighway. At the heart of this strategy to control developers and consumers is the requirement that app developers use Apple's and Google's in-app payment services or credit card processor, for which they charge a whopping 30 percent tax.

Do not take my word for it. The late Apple CEO, Steve Jobs, devised this strategy. Back in 2010, Apple grew wary that it was far too simple for users to switch between iOS and Android devices because app developers were allowing users to buy services directly from them that could be used readily on either platform. His directive was simple. Let us force them to use our payment system. He knew that once users paid through Apple and not the app developer, they would be locked to Apple's ecosystem, tying their purchases to their iOS devices and forcing app developers to hand over the lifeblood of their businesses, their customers relationships.

Let me share just two examples of our experiences that unequivocally demonstrate the monopoly power of these app stores. Shortly after Google launched the Google Play store, they persuaded us to join the Android ecosystem under the false pretenses of an open platform where we would not be required to use Google's payment processor or pay the 30 percent tax. Now, years after helping them establish their app store monopoly by bringing our apps and our customers to the Play store, Google is leveraging its monopoly power to change the rules, tying its in-app payment system to our access to the Play store starting in September of this year.

Not to be outdone, Apple has been equally authoritarian. A few years back, Match wanted to institute ID verification rules in our Taiwanese app that mirrored those already required in Japan. Apple rejected our app. Perplexed, I personally contacted the App Store's head lawyer to explain why this was the right thing for our business and why it kept our users safe. I was told in no uncertain terms that he disagreed with our assessment of how to keep our users safe. He added that we should just be glad that Apple is not taking all of Match's revenue, telling me, "you owe us every dime you have made." I was floored.

Senators, this is not curation, as we have been told. It is iron fisted monopoly control. When an industry player has the power to dictate how apps operate, how much they will be forced to play, and in many cases, if they will even survive, it is a monopoly. This is the same behavior of the robber barons before them. It is no wonder that so few companies have been willing to stand up and testify against these monopolies. Would you take that risk if you were a small business?

These monopoly activities result in many harms to app developers and consumers, but I will focus specifically on four. First, safety is actually harmed in the current system. Because of Apple's and Google's stranglehold on consumer data, it is difficult for us to even conduct the most basic safety checks for our apps. For example, despite multiple requests over the years, Apple and Google still allow underage users to download our apps, even when they know they are under 18. Apple and Google actually make it harder for us to keep our users safe.

Number two, Apple's and Google's in-app payment rules force users to hand over massive treasure troves of their most sensitive data which these tech titans can use to enrich their own products or develop their own competing digital services nearly overnight and charge 30 percent less.

Number three, the app store tax. Today instead of there is an app for that, Google's and Apple's practices could be better described as there is a tax for that. The 30 percent tax levied on every digital transaction increases costs on consumers and developers alike. For Match, these app stores fees are our single largest expense, eclipsing half a billion dollars annually. That is $500 million that could be going back into the pockets of everyday employees, or excuse me, everyday consumers, or deployed to hire employees or invested in new innovations.

Number four, incentivizing the monetization of selling user data and reducing innovation. Apple and Google essentially push developers to adopt a less privacy-friendly business model, incentivizing them to avoid mandatory in-app payment by operating more like Facebook, where consumer data is the commodity and monetized. Additionally, by removing competition in the payment space, innovation is harmed. When the veneer of their safety, security, and privacy arguments shatter under the weight of scrutiny, Apple and Google respond that they built the platforms and should be able to decide what business models they use.

Members of the Committee, I submit that the railroad companies build the railroads. The steel companies built the steel mills. The telephone companies built the telephone lines. The creators of all of these incredible innovations each made the same arguments at different times. It did not justify a monopoly then and it should not today. Thank you and I look forward to answering your questions.

[The prepared statement of Mr. Sine appears as a submission for the record.]

Chair KLOBUCHAR. Thank you very much. That was very powerful, Mr. Sine, as was all the witnesses before us.

Let me start out here with you, Mr. Gutierrez. Both Apple and Google charge app developers a 30 to 15 percent commission fee for processing in-app purchases of digital services. Both companies point out that the majority of apps do not pay any payment processing commission because they are free apps or because they are selling nondigital products or services, but many of those who must pay the commissions find them duly burdensome. I am concerned that these commissions can be used to suppress competition when they raise the cost of app developers that compete with the apps or other products or services that are offered by the app store operator.

Spotify has raised concerns about the competitive impact about these commission fees. Can you describe the effect of these in-app commission fees, what effect it has had on Spotify's ability to compete? Can you just pass these fees on to consumers?

Mr. GUTIERREZ. Thank you, Senator. Thank you for your question. There was a time in which, under pressure from Apple we had to implement Apple's in-app payment service, and as a consequence of that, had to start paying the 30 percent Apple tax. The consequence of that in a business like ours, where so much of our revenue has to go to pay for the licensing and content from artists and music labels and others, is that, in fact, we had no choice but to increase our price to be able to afford the 30 percent tax that Apple was imposing on us. We had to raise our consumer prices from a monthly subscription of $9.99 to $12.99.

Unbeknownst to us, as Apple was putting pressure on us to do that, Apple was in the process of acquiring Beats Music, rebranding it as Apple Music, and then just a couple of months after we had to increase prices, Apple launched Apple Music at $9.99, which meant they were now undercutting us on price because we had to pay the 30 percent tax to Apple. Faced with this reality in which Apple was now putting us in this uncompetitive situation from a consumer price perspective, we had no choice but to take the IAP functionality now.

What followed after that was a series of steps on the part of Apple threatening us to kick us out of the App Store. Just imagine the power of a threat on the part of a platform like Apple to take you out of the App Store, what that might mean for your business. A number of steps in which they not only said it was not enough for us not to provide a link to a payment mechanism, but we could not even tell users that there was a subscription option and that there were discounts that we were offering that would make the product cheaper. This gag order, in terms of the communication with our own customers, makes it incredibly hard for us to persuade the user of a free app to upgrade to a subscription app, which is, frankly, in a premium model like ours, how the business can work and how the creators that put their content on our platform can be fairly compensated. This is a very clear——

Chair KLOBUCHAR. Okay. Okay. I am going to keep going. It is an amazing story and at some point I will go to Mr. Andeer here to explain this, but there is another piece of this is that not only are you charged these fees and you are forced to pass them on when you do not want to, but it is my understanding that the app stores bar app providers like Spotify from telling your customers through the app that your services would be cheaper if they could directly buy them online. If those marketing bans were eliminated, what would you tell your users and how do you think it could affect them?

Mr. GUTIERREZ. That is a super important issue because our communication with our user is the way in which we get them to know about the opportunities they have about subscription. If we cannot do that, then we cannot make the premium model work. Apple knows that because they are in the business. They know exactly the importance of that.

Chair KLOBUCHAR. Okay. Alright. Alright. Mr. Sine, Match had a program which you testified about or which called T-Mobile Tuesdays that offered discounts through T-Mobile's app. Is that right?

Mr. SINE. That is correct.

Chair KLOBUCHAR. Apple shut it down as I understand it. Is that right?

Mr. SINE. That is correct. They blocked T-Mobile's app.

Chair KLOBUCHAR. Okay. If Apple changed its rules to allow Match to offer discounts would you do so and how would that work?

Mr. SINE. One hundred percent. We actually already offer, for example, in our Tinder app if you subscribe through the website you get a discount relative to what you would pay in the app, so that already exists. We would 100 percent take advantage of that if we could.

Chair KLOBUCHAR. Okay. Ms. Daru, you testified that Apple essentially copied Tile's app and took steps to undermine Tile's functionality by changing the iPhone operating system to favor their competing product and by limiting Tile's access to data. Yesterday Apple announced the launch of a new product that looks a whole lot like Tile. Can you elaborate on the ways in which Apple's conduct has reduced Tile's ability to compete?

Ms. DARU. Absolutely and thanks for the question. All of these actions really started when it became known to us that Apple was going to enter the market and attempt to take it over. Really what they did was with the exact same operating system update that they introduced the new FindMy app, they took away one of our critical permissions which requires our customers to go deep, deep, deep into their settings to turn Tile on. FindMy, by contrast, is on by default through the—when you set up your operating system. In order to turn it off, you have to go deep into your settings and actually enter a password.

Apple also started serving prompts with that same update to our users. Once they figured out how to turn Tile on, they started serving these prompts encouraging them to turn Tile off, but they did not serve up those prompts for FindMy.

Our Bluetooth network, of course people need to opt-in to the Bluetooth network. I think that is great. We are complete supporters of consumer transparency, but the FindMy Bluetooth network in the new FindMy app is on by default.

Then with the AirTags, as I discussed, we have the UWB issue which I will not repeat, but there is something else. It is something they call the magic onboarding flow. To connect your AirTags with your phone, you do not even have to open the FindMy app. You just put them near, but that magic flow is not available to third parties like Tile.

In addition to all of that, Apple launched this product and its competing app with a knowledge of a lot of information about our business. They know our retail take rates. They know our retail margins. They know how our devices do in stores. They know who our customers are. They know our subscription take rates. They know what features people use. I mean the list goes on and on and that is another concern. Thank you.

Chair KLOBUCHAR. Okay. Thank you. Alright. One of the things I have noticed as we have talked to people affected by all of this and the commission fees and the like, they have come forward. A lot of them—I am not going to give their names publicly because they are actually afraid to testify. I guess I do not blame them because they feel that it is going to hurt their business. They are going to get intimidated. You mentioned, Mr. Gutierrez, I am not asking you this question. Some of the retaliation you thought that you felt you experienced for coming forward.

Mr. Sine, have you have any examples of retaliation for coming forward?

Mr. SINE. Senator, we have had outreach with respect to our coming forward for sure.

Chair KLOBUCHAR. By who?

Mr. SINE. By Google.

Chair KLOBUCHAR. What happened?

Mr. SINE. They called us last night after our testimony became public to ask us why our testimony was different than what we had said about the situation in our earnings call earlier this year.

Chair KLOBUCHAR. Is it different?

Mr. SINE. We had said in our earnings call earlier this year was that we believed we would be able to work through the issue of Google imposing their 30 percent on us, which we have been working very hard at over the last few years meeting with regulators and others to try and change these practices and ensure this from not happening. Google actually first threatened us in 2017 that they would roll out this in-app payment requirement to us and they have slow rolled that until they announced it last September.

Chair KLOBUCHAR. I am just picturing this compared to Australia where they threatened to cutoff a whole country simply because they wanted to charge for content. If you were to somehow keep experiencing retaliation, I would assume there is—I do not want to keep going into my time. We have several Senators here—three more. Another one on the way. I just want to know could they hurt you in little ways that it would be really hard to detect?

Mr. SINE. They could hurt us in little ways. They could hurt us in big ways. They could easily remove our app. They could, again, as they are doing, impose the 30 percent tax that they had never imposed on us before. There are many, many ways they can hurt our businesses. We are all afraid is the reality, Senator. We are fortunate you are listening to us today.

Chair KLOBUCHAR. I hope the Justice Department is too.

Mr. White, why did someone from your company call Mr. Sine? You know, Match is a major competitor here in the market. We all know who they are. Why did they do that last night?

Mr. WHITE. Thank you, Senator, for the question. Not only is Match is a competitor, Match is a major partner of ours, a very valued partner of ours. My understanding based on what Mr. Sine said is it sounds as if some business development folks who are working on commercial conversations had a conversation and asked a honest question of why sworn testimony was different from what was stated in a public earnings call. I respectfully do not view that as a threat and we would never threaten our partners, Senator.

Having developers choosing to distribute through Google Play is core to our business. The idea that we would threaten partners who actually share in the success that we have as a platform is the antithesis of how we carry out business, Senator.

Chair KLOBUCHAR. Okay. My last question. We will have another round. Mr. Andeer, this is about some of the things that Ms. Daru talked about. Does Apple's developer agreement authorize Apple to use an app developer's confidential technical and business information to create apps that compete against the developer?

Mr. ANDEER. Senator, no, it does not. We compete on the merits. We have looked at different products, different markets, and we ask ourselves time and time again what can we do different. What can we bring that is unique and special to the marketplace? I think AirTags is one of those products. We think it is a very different product than anything else that is out there. We are super excited to launch this product tomorrow. I think if you will look at it, it is extremely different than anything else in the marketplace. We

are doing it the same time as opening up the FindMy network so we can see third-party innovation grow.

I mean currently this market is dominated by Tile with 80 to 90 percent of the market, so we think we are going to see a lot more competition thanks in part to the product that we are launching tomorrow, but also importantly, by opening the FindMy network to all the third parties that are out there and are really excited to bring products to the marketplace.

Chair KLOBUCHAR. Do you use any non-public information or data from the App Store? Did you copy anything from Tile?

Mr. ANDEER. Senator, I appreciate the question. Absolutely not. We did not copy Tile's product. We did not copy Tile's application. I think if you look at the AirTags that will be released tomorrow, if you look at the FindMy application, you will see that this is a very different product, a very different experience than what you see with Tile. We are excited to compete and offer that choice to our consumers.

Chair KLOBUCHAR. Why do you have to charge 30 percent to Spotify?

Mr. ANDEER. Senator, I appreciate the opportunity to respond to that. The fact of the matter is that Spotify has grown an incredibly successful business. To their credit, they are incredibly innovative, incredibly aggressive when it comes to dealing with artists and creators and driving a hard bargain. They equally drive a hard bargain with distributors. They built the market leading, dominant music streaming business in the world.

In terms of subscribers, they have 155 million subscribers around the world. Tens of millions of those are on the iPhone. Less than one percent pay a commission to Apple. In fact, they are only paying a 15 percent commission. The price that Mr. Gutierrez mentioned in terms of increasing it by 30 percent, guess what? They have never reduced that price once for their consumers. Hey, they are a great company. They push us to compete each and every day, but I respectfully think we are offering choice and options to our consumers.

Chair KLOBUCHAR. Uh-huh. I am just thinking they did not bargain for that much money of 30 percent. I am going to turn it over to Senator Lee.

Senator LEE. Thank you, Madam Chair.

Ms. Daru, let us start with you. You talked a little bit about AirTag. By the way, I have used your product. It is a fantastic product.

Ms. DARU. Wonderful.

Senator LEE. Very helpful to a lot of people. I want to make sure I understand this correctly. Did Apple start treating Tile differently in advance of the product launch? Is that what you are saying?

Ms. DARU. That is correct.

Senator LEE. I understand that Apple requires companies like Tile and including Tile to sign an agreement to be part of the FindMy network.

Ms. DARU. Correct.

Senator LEE. What can you tell me about what that agreement requires?

Ms. DARU. Unfortunately, I am not at liberty to say because I am under an NDA by Apple.

Senator LEE. Okay. Mr. Andeer, will you agree to allow Ms. Daru to talk about the FindMy network agreement?

Mr. ANDEER. Senator, obviously that agreement covers a number of proprietary technologies in work that we are still developing here at Apple, so I cannot grant a blanket waiver to discuss it because there is a number of proprietary technologies and issues involved in that agreement.

Senator LEE. Could you grant a waiver to the extent it does not include disclosing proprietary technologies? I mean our focus in this hearing is to discuss the state of competition and competition policy as it relates to app stores. Is there not a way to craft that waiver?

Mr. ANDEER. I am sure that there is, Senator. It is a little hard to do this in the moment, in the vacuum, but certainly general commercial terms, again, those are still being hashed out.

Senator LEE. We are interested in contractual limitations, not intellectual property.

Ms. DARU. Correct. Just contractual terms. No technology, nothing technology related at all.

Senator LEE. Just to be clear, Mr. Andeer, your response related to your proprietary technology, to your IP. I did not hear you say anything about your contractual limitations, which is what we are wanting to inquire into. Is your answer still the same?

Mr. ANDEER. Senator, part of the challenge here for me frankly is we just launched this program 2 weeks ago. We are in the midst of talking about it with a number of different parties.

Senator LEE. Sure. Sure. No. I understand you just launched it, but it is not like it materialized like manna from heaven. It did not just show up.

Mr. ANDEER. That is correct, but right now we are collecting feedback from a number of developers. We are engaged with dozens of third-parties who are really excited to use this technology and give me feedback on all of these terms, so I am in a bit of a difficult position.

Senator LEE. Okay. I would appreciate it if you could look into that. Again, we are not—we have no interest in, we have no jurisdiction over IP aspects of it. We want to know about your contractual obligations there.

Mr. Sine, in your written testimony suggests that Apple and Google have refused to work with you in order to improve user safety. Can you tell us a little bit about more about what you mean by that?

Mr. SINE. Yes. First and foremost, the issue I raised in my testimony was about underage users. We are a platform that has decided because we are online dating, it is appropriate for only users that are 18 and older. Apple and Google collect information as users are registering for their iTunes accounts or their other accounts through which they will actually download those apps. In many instances, they actually know the age of those users. If you are a user and you move through that flow and you are 15 years old, you will get a pop-up that says, "by clicking here you are

agreeing that you are over 18," even though Apple knows you are not because you have already entered your birthdate as 15.

Those get passed on to our app. We then have to filter them out through our various age gating systems in order to make sure that we do not have underage users on our platforms.

Senator LEE. Right. No. I have encountered that. One of my teenagers, a few years ago when I was arranging to pay her allowance, I tried to do it through Apple Pay. We could not do it at the time. She was not 18 at the time. That would suggest that they do, in fact, know which user. To have an iPhone, to operate with an iPhone, you have got to have an iTunes account. If it is a minor, it can be linked to an adult's account. It was. It knows that she was a minor.

Mr. SINE. Correct.

Senator LEE. We even tried to jerry rig it and go around it and it would not let us because it knows. That is troubling or that is significant at least if they do know this and knowing that and allowing that to be known could be useful for the purpose of protection. We live in a world where people do a lot of bad things to kids. It is hard for me to understand why they would not want to share that information.

Mr. SINE. We agree, Senator. You know, in addition, our platforms for years have run registered sex offender checks. We have asked Apple and Google to share the data with us that would make it easier to run those checks. Again, there has been, while some lip service to it, very little work done. We have then gone around them in order to speak with people here in the Senate, to try and help craft legislation that would actually allow us to be able to run those checks with different data. We have also helped to support a bill that passed in Arizona that would allow us to get access to that data to go around the fact that Apple and Google do not share the information we need in order to run those checks.

Senator LEE. Mr. Andeer and Mr. White, now as has been noted, we have got ride-sharing apps that use the internet to help you find transportation in the real world. Match's dating apps use the internet to help you find a date in the real world. Why does Match have to use your payment services and give up 30 percent or 15 percent of its revenue, but Uber does not? Let us start with Mr. White and then go to Mr. Andeer.

Mr. WHITE. Thank you, Senator Lee, for the question, and it is a good one, a very important question. The way we have designed our business model is to align our interests with our developer interests. We only get paid when our developers are engaging in the sale of digital content and only when that sale occurs in the app itself.

When it comes to physical goods and services, we are not in a position to really protect users on what happens in the physical world, right. We will not know whether that Uber driver arrived on time or whether your groceries arrived in an acceptable state. When it comes to digital content, that is where our investments have been. That is where our value add is. That is why we have chosen the business model to align our interests with developers who are actually selling digital content to our shared users.

Senator LEE. Mr. Andeer.

Mr. ANDEER. Senator, thank you. Apple's App Store was created 12 years ago based on a simple model. That is if you are selling a digital good or service, you are subject to a commission. Obviously we have made changes to that model over time in terms of making it easier for developers to sell outside of their app in terms of reducing the price over time. When it comes to this question about physical goods or services, like using Uber to call a car to your house to pick you up and take you to the airport or a Lyft to go and meet friends. With that, you are using the phone to communicate with the service provider and they are delivering that service to your home or your location.

When it comes to a dating service, and obviously Tinder has built quite a successful business and they have a number of these sites. What they are doing is facilitating meeting with people digitally. All of that is taking place, at least it should be, on the device. That is you are finding a match. You are meeting someone. You are swiping right or left. All that is taking place on the device. From our perspective and from really the perspective of all the developers we have talked to, that is a digital good or service. That is not a physical good or service being delivered to your house.

Senator LEE. What if your business involves the downloading of some other digital service? The downloading of e-books, of audio books, or something like that? If you are saying it is a digital service, wouldn't that extend to the purchase of downloads of books?

Mr. ANDEER. Senator, yes. Senator, yes, it does. Folks like Amazon and their very popular Kindle app have been——

Senator LEE. How is that different than Match.com's apps?

Mr. ANDEER. They are both selling a digital good or service. One is a book. The other is a subscription to a service where you are meeting other people that you may be interested in.

Senator LEE. Okay. Uber——

Mr. ANDEER. In both cases——

Senator LEE. Uber, that is also a digital service in the sense that you are trying to find a ride. You are also paying for that ride. It involves movement of the person once the ride arrives, but in all three instances downloading of books, arranging to meet someone to date, or finding a ride. Aren't those all three digital services where you are exchanging information through the app?

Mr. ANDEER. Senator, respectfully, I see the car service very differently than the dating service or the audiobook. The dating service, you are meeting people on your phone. On the book, you are reading the book on your phone or your iPad. With the car service, I am calling a car to my house to come pick me up and take me to work or to the airport or wherever I might be going. The value I am getting from Uber and Lyft is a way to get a car to go from A to B.

In terms of the other examples, all of the experience is contained within the four corners of the device. You are not paying Tinder——

Senator LEE. Uber is literally meeting a stranger for transportation. I am not grasping the differentiation point between meeting a stranger for transportation and meeting a stranger to go to dinner. I do not get it. I am just a small country lawyer from Provo, Utah, but I am not——

Chair KLOBUCHAR. Oh, yes. Right.

[Laughter.]

Mr. ANDEER. Senator, respectfully, when I am using Uber or Lyft, I am calling a car to my house to physically get in it and drive somewhere. When I am using—and I do not use these—a dating service to meet someone, I am not using it to pay that person to come to my house and to go on a date. That is called something else.

Senator LEE. I feel like unfrozen caveman lawyer as portrayed by Phil Hartman in Saturday Night Live. I am just—I am not grasping it, but I see my time has expired and I want to be deferential to our Chair. Thanks.

Chair KLOBUCHAR. Very good. Next, Senator Blumenthal.

Senator BLUMENTHAL. Thank you, Madam Chairwoman. I am just a country lawyer from Connecticut. I tried to use that line once, Senator Lee, in the Supreme Court in an argument there and I think it is the closest I came to contempt of court. Anyway.

Let me just say after listening to my colleagues, I am tempted to say Google and Apple are here to defend the patently indefensible. If you presented this fact pattern in a law school antitrust exam, the students would laugh the professor out of the classroom because it is such an obvious violation of our antitrust laws.

Mr. Gutierrez, you remarked in your testimony that you were at Microsoft during what you call the heyday of its antitrust woes. I remember those days because I sued Microsoft. The lesson from that case that you expound here that these practices are exponentially worse is absolutely true, but the larger lesson that you tell us that the current laws are not working. In effect, that enforcement of them is too little too late. Courts are overly deferential. Agencies are reluctant to bring lawsuits. Therefore, we need to reform our laws is the takeaway here.

Mr. GUTIERREZ. That is correct, Senator. I think one has to appreciate both from the point of view of the legal tools of being able to overcome this deferential approach and the task that the enforcement agencies would have to do that. You also have to recognize that in this case you would be looking at the business and the practices of trillion dollar companies that have a global footprint with a tremendous information asymmetry. Both from the point of view of the legal tools that the enforcement agencies need as well as from the point of view of resourcing. I think if something meaningful is going to happen those things have to be looked at.

Senator BLUMENTHAL. What I heard Apple tell you in defense of charging you this rent, whether it is 15 percent or 30 percent hardly makes any difference. It is rent, arbitrarily imposed, to try to stifle competition and increase Apple's profits at your expense is, well, you can afford it. The fact of the matter is, that, as you said, Spotify has to pass it on to consumers and it inhibits innovation and competition, correct?

Mr. GUTIERREZ. That is correct. Apple knows the business really well because they are in it. They are a direct competitor of ours. This is a textbook case of raising rivals' cost, which is what they are doing. They recognize, because they know the music streaming business, that we have high costs associated with paying for the content to the artists and musicians and they know that our mar-

gins are tight and that a 30 percent tax, even if it eventually might come down to 15 percent, it is just too large a fee to be able to absorb without passing on that increase to consumers.

Senator BLUMENTHAL. Just to show you that Apple is well aware of the value of this practice, it does not allow users to jailbreak their phones to sideload apps. It has shut down alternative app stores. In fact, as we know, Apple was sued by an alternative app store, Cydia, on monopolization grounds. Cydia's complaint makes clear that Apple not only excluded them from the iPhone market, but lifted Cydia's popular features and incorporated them into Apple's App Store. It is not only a matter of making you charge consumers more. It is also a method to suppress competition and steal good ideas, correct?

Mr. GUTIERREZ. That is correct. Senator, just to follow on your point, if Apple is convinced that their payment system is that superior, that it really should command a 30 percent fee, they should allow for competition and let the market determine that. Let supply and demand determine what the right fee is, but they have not done that. They have not legally done that.

Senator BLUMENTHAL. That is right. They have not done it because the law has not been enforced against them. What we have is a classic case of exclusionary anticompetitive conduct. As I think all of us would agree, violations of the law and monopolistic abuse of power, just as it happened in the Microsoft case, need to be held accountable. That is why I support strengthening Section 2 of the Sherman Act to curb anticompetitive exploitive conduct by monopolists and other dominant companies. That is why we need to consider also interoperability as a remedy like it was in the Microsoft case and in the Access Act that I have cosponsored with Senator Warner.

Mr. Sine, we have this apparent explanation of the call to you last night, right?

Mr. SINE. The call was not to me. The call was to our person who has a business relationship with Google. It is our representative talking to their account representative.

Senator BLUMENTHAL. A representative of your company.

Mr. SINE. Correct.

Senator BLUMENTHAL. Out of, what do you think, idle curiosity? Why was the call made?

Mr. SINE. I cannot really speculate on it, Senator, but, you know, anytime you receive an inbound call——

Senator BLUMENTHAL. We are plausibly interpreting it because of the timing, because of the content of the call. We do not have evidence of the exact words spoken, but it looks like a threat. It talks like a threat. It is a threat.

Mr. SINE. When you receive something like that, Senator, from a company that can turn you off overnight, you are always a little intimidated.

Senator BLUMENTHAL. Correct. It has not been reluctant to throw its weight around similarly. I think it is an insult to this Committee. I think it is more than an insult. It is potentially actionable and I think we should look into more information about it. Would you agree?

Mr. SINE. We would be happy to comply and work with you on that.

Chair KLOBUCHAR. That is the plan, Senator Blumenthal. Thank you.

Senator BLUMENTHAL. Thank you, Madam Chair. I thought it probably would be. Thank you.

Chair KLOBUCHAR. Yes.

Senator BLUMENTHAL. Let me turn to another area that Senator Klobuchar has ably begun to explore. I did not hear an answer to Senator Klobuchar's question, Mr. Andeer. Has Apple ever used app developer's information to inform its own product strategy?

Mr. ANDEER. Senator, I am not aware of anyone at Apple using proprietary information from the App Store to develop our products. It is the antithesis of how we approach product development and innovation.

Senator BLUMENTHAL. Well——

Mr. ANDEER. We always create something different and special and unique for our customers.

Senator BLUMENTHAL. I notice that you carefully couched that answer in terms of proprietary information, but the fact of the matter is Apple has in effect appropriated—a euphemism for unauthorized taking of this information to copy and kill competitors. It has reportedly done this so often that it has earned a nickname with developers, sherlocking. Apple and Google have access to troves of private information about apps on their app stores and it enables them to identify popular and nascent apps and then copy and kill them by introducing those competing apps that mimic the original.

Apple's former CEO, Steve Jobs, put it the company has "always been shameless about stealing great ideas." That seems to be the MO of Apple and there are numerous examples of this copy and kill strategy. We have heard about AirTags, which are carbon copy of Tile's item tracking products. Let me ask you, Mr. Andeer, do you impose a strict firewall? Does Apple impose a strict firewall between the App Store and its business strategy?

Mr. ANDEER. Senator, if I understand the question correctly, we have separate teams that manage the App Store and that are engaged in product development strategy here at Apple.

Senator BLUMENTHAL. Yes. I understand you have separate teams. Do you have a barrier between the two? What we call in law firms, a Chinese wall. Do you have a strict prohibition against the sharing of information between the App Store and the people who run those businesses?

Mr. ANDEER. Senator, we have controls in place. I would also hasten to add that in terms of when you look at the marketplace over the last 12 years, we have only introduced a handful of applications and services during that time. In each and every instance, there are dozens of alternatives available through the App Store, oftentimes more popular and more successful than our own Apple service or product. We do not copy. We do not kill. What we do is offer up a new choice and a new innovation for consumers.

Senator BLUMENTHAL. The answer though to whether you have a data firewall is no. That is the way I took the answer to my question. Mr. White, does Google have a firewall between the app store and its business strategy?

Mr. WHITE. Senator, my understanding is we do have data access controls in place that govern how data from our third-party services are used.

Senator BLUMENTHAL. When you say access control, do you mean a firewall? In other words, no access.

Mr. WHITE. I am not sure exactly what you mean by firewall, Senator.

Senator BLUMENTHAL. Do you have a prohibition against access?

Mr. WHITE. We have prohibition against using our third-party services to compete directly with our first-party services, Senator.

Senator BLUMENTHAL. How long have you had it?

Mr. WHITE. We have internal policies that govern that.

Senator BLUMENTHAL. I am going to explore this question in written questions. I apologize that my time has expired. Thank you, Madam Chairwoman.

Chair KLOBUCHAR. Very good. Thank you, Senator Blumenthal. Senator Hawley.

Senator HAWLEY. Thank you very much, Madam Chair. Thanks for holding this hearing. Thanks also to Senator Lee. It is no secret to anybody on this Committee that I think that antitrust enforcement not only needs to be a top priority, but we need to make significant changes to our antitrust laws in order to ensure that we are doing everything we can to get real antitrust enforcement in this century.

Let me just come to you, Mr. Andeer. I notice since last April Apple has bought back $58 billion in stock. That is a big number. Quite a shift from where you were under Steve Jobs who used to insist that Apple would not buy back stock because it needed to innovate. It needed to retain those profits in order to reinvest, but you have clearly changed position. That is fine. I just want to focus on one major source of that income. It is not innovation. It is not research and development. It is the monopoly rents that you collect out of your App Store.

I notice that you today have referred to the need to have that monopoly control over the App Store in terms of the security rationale behind it. Tim Cook has said the same thing. He said recently in a New York Times podcast that Apple needed to lock up the ecosystem, the iOS ecosystem, so it could limit vulnerability. The thing about that that seems strange to me is you do not seem to spend very much money on actually on security. I mean all of the money you make on your Apple tax, you do not invest very much of it into actual security.

In fact, it looks to me like you did not even launch your bounty program where you pay researchers to discover security vulnerabilities on iOS until 2016. When you did that, you capped it. You had a hard cap on the spend. You finally raised the level somewhat in 2019. It does not seem to be that big of a priority.

Let me just ask you this. Here is my question. Will you commit, will Apple commit to spending all of the money that it raises, all of the income it raises out of that Apple tax, all those monopoly rents, will it commit to spend all of those on security since that is allegedly why you need to have a monopoly in this market?

Mr. ANDEER. Senator, I appreciate the question. We have invested billions of dollars in securing our iPhone, our App Store, and

all of our products. This is a priority for us each and every day we wake up, 24/7, 365 days a year. If you look at the App Store and app review process, we get 100,000 submissions each week. We have a combination of AI and human review to review all of those. We reject 40 percent of them because they may post some sort of either performancec, security, privacy risk to consumers. This is something we take incredibly seriously.

If you look at the objective studies that are out there, time and time again they find that the iPhone is the most secure platform and the most secure device available on the market.

Senator HAWLEY. I did not—thank you for that. I do not think I heard a yes or no though in there, so let me just try again. Will you commit to spending—if security is the reason you need to have this monopoly and collect these monopoly rents which are sizable, will you commit to spending that money, all of it, on security for apps?

Mr. ANDEER. Senator, the App Store, we are going to continue to invest in the App Store. There is a number of things that we do to ensure that developers are able to create their apps. There is all the tools and resources and applications that we make available to developers. That is part of what is at issue with our model. We also invest obviously to make sure that our marketplace is trusted and safe for consumers. There is a number of competing investments and incentives for us to make sure that we continue to put the very best experience.

Senator HAWLEY. Okay. I do not mean to cut you off. I just have limited time. That sounds like a no to me, which is kind of what I thought you would say. My concern with that is just it makes it hard for me to ignore the major dangers to competition that your monopoly in the iOS market poses.

You recently announced that the smallest developers in the App Store will pay a reduced fee, 15 percent. That is very generous of you. You announced earlier that you take only 15 percent from subscription revenue after the first year. You take 30 percent in that first year. Here is my question. Does Apple ever cut more generous deals to well-connected executives in other companies? You know, to bigtime companies. Not to the small companies, but do you ever cut more generous deals to the really big companies?

Mr. ANDEER. Senator, we do not. A fundamental principle since the very beginning is we treat all developers the same. When we launched the store 12 years ago, we took the price, which was 60, 70 percent, and took it all the way down to 30 percent, in part because we wanted to encourage those new small and midsized businesses to enter this market. What we have seen over the last 12 years as we have evolved that model and we have reduced price time and time again is now we have a marketplace with 1.7 million apps, 85 percent which pay nothing. We think it has been an incredible benefit to startups, to small and mid-size businesses, and individual entrepreneurs.

Senator HAWLEY. I find that answer strange because the House Judiciary Antitrust Subcommittee uncovered documents from 2016 that showed that Eddy Cue of your company negotiated a deal directly with Jeff Bezos at Amazon for a special deal from Prime Video whereby Apple would collect just 15 percent of the revenue

from customers signing up within the Amazon app for Prime Video. I am curious on what basis these special terms were offered to Amazon.

Mr. ANDEER. Senator, there was no special deal provided solely to Amazon. Those negotiations led to a new program on the App Store, the premium video partner program. There are over 200 developers that have taken advantage of this program, including Amazon. There are a number of developers. It is open to all. It is another with instance in which we have reduced the price to developers to encourage new innovation and investment. We made those same terms available to every developer.

Senator HAWLEY. The program is the established program for premium subscription video entertainment providers, if I am correct. What happened here for those who are keeping score at home, is that years later when it was discovered that Amazon had—that Apple rather had given Amazon a special deal, Apple comes back and says, "oh, no, no. We have had a program. It is established. It is this program for premium subscription video entertainment providers." That is a mouthful. Of course, premium subscription video entertainment providers means it was not by definition open to everybody.

This is not the first time that Apple has done this. The House Antitrust Subcommittee revealed that Apple granted Baidu—that is a Chinese company—a fast track through the app review process and even assigned two employees to give Baidu concierge service. You have also given Netflix special deals that other smaller developers like app HEY did not get, for example. It looks like to me, here is my point. It looks like to me that what you have done is you have been willing to cut special deals with other major companies who already have significant market power and have significant market share and could use it to squeeze you, but for smaller competitors who are trying to get into the market, for those guys and gals, there you really put the squeeze on them. Isn't that accurate?

Mr. ANDEER. Respectfully, Senator, it is not. We have operated a store for the last 12 years that has continually looked for ways to encourage small and independent businesses to grow and develop on the App Store. There is program after program that we have launched. We feature these apps on our App Store in terms of small and innovative applications. We launched the small and midsize business program last year which reduced the commission for small businesses that was subject to the commission. We are going to continue to find ways to invest to make it possible for everyone to create on the App Store.

Senator HAWLEY. My time has expired. I look forward to pursuing some additional questions with you and for the other witnesses in writing. I will just note in closing that what it looks like to me, the pattern here, is that Apple is happy to jerry rig the rules and is happy to cut special side deals and is happy to try and turn away—keep bigtime competitors from cutting into your market, make special deals with them, while putting the squeeze and the lid on small competitors all in service of keeping this gravy train of monopoly rents flowing. That is a big problem and it is one that

I think that it is time we addressed and that is one of the reasons I am glad we have had this hearing today.

Thank you, Madam Chair.

Chair KLOBUCHAR. Thank you very much, Senator Hawley. Next, Senator Ossoff.

Senator OSSOFF. Thank you, Madam Chair. Thank you to the panel.

Mr. White and Mr. Andeer, Senator Hawley noted that you have consistently argued a justification for the market power you exercise here as your ability to regulate the safety and security and protection for consumers of apps that are sold on your platforms. One of the things that I think is most distressing is that it is trivially easy to find apps on both of your platforms which are scams, which are promoted by in some cases hundreds or thousands of obviously fake positive reviews, and which trap users in billing arrangements that are expensive, punitive, improperly marketed. It is very difficult to unsubscribe from some of these monthly billing arrangements.

What steps are you taking to end the proliferation of scam apps on your platforms when you state publicly, repeatedlyc, that the value of your platforms is in consumer protection, safety and security of the consumer, and why do we rely upon open source reporting and journalists to find all of these apps that are trivially easy to identify as scams? Mr. Andeer, go ahead, please.

Mr. ANDEER. Sure. Thank you, Senator. We have invested tens of millions, hundreds of millions of dollars, in hardening and improving the security. Literally billions of dollars over the years. Unfortunately, security and fraud is a cat and mouse game. Any retailer will tell you that. We are constantly working to improve and we do that in a variety of ways.

Internally, we are investing in more resources, more technologies, more tools to make sure that we can catch these wrongdoers. We reject thousands, tens of thousands of apps each year that pose a risk to our consumers, whether it is from the perspective of security or from fraud. We also rely on our external community. There are a number of stakeholders who will raise issues and this is important. Unfortunately, no one is perfect. I think what we have shown over and over again, we do a better job than others. I think one of the real risks of opening up the iPhone to sideloading or third-party app stores is that this problem will only multiply. If we look at other app stores out there, we look at other distribution platforms, it scares us, so.

Senator OSSOFF. Mr. Andeer. Mr. Andeer, thank you. I appreciate the response and I want to talk about the sideloading question in a moment, but let me just ask you this. When again there is so much reporting in tech press, there are independent researchers who find many of these scam apps on your platform. Sometimes they hook people into paying ten bucks a week or ten bucks a month recurring subscriptions for meaningless services. Apple is making a cut on those abusive billing practices, are you not?

Mr. ANDEER. Respectfully, Senator, I do not believe that is the case. If we find fraud, if we find a problem, we are able to rectify that very quickly and we do each and every day.

Senator OSSOFF. If you identify an app, Mr. Andeer, that is obviously engaged in scam billing practices, does Apple refund all of Apple's revenues derives from those scam billing practices to the consumer?

Mr. ANDEER. Senator, that is my understanding. There is obviously a dedicated team here at Apple who works this each and every day, but my understanding is that we work hard to make sure that the customer is in a whole position. That is our focus at the end of the day. If we lose the trust of our customers, that is going to hurt us.

Senator OSSOFF. Mr. White, another question about consumer safety, privacy, and security. Certain apps available through Google's platforms as well as Apple's platform have included software development kits, SDKs, which send user location data to third-parties, often location data brokers. There is a massive market for this data. Governments buy it. Corporations buy it. Spies buy it.

In one prominent example, a location data company called X-Mode sold consumer data to defense contractors derived from its SDK on products sold on both the Apple and Google stores. Both companies announced they had banned the products, but researchers continued to find the X-Mode SDK, Mr. White, in hundreds of Android apps even after the ban. Are any X-Mode SDKs still present on apps sold on Google's store and what steps are you taking to protect your users from the sale of location data to data brokers?

Mr. WHITE. Thank you, Mr. Ossoff. It is a really good question. The security issue, as Mr. Andeer said, it really is a difficult one and one we have to invest in heavily to stay in front of. That is why on every Android device that has Google services, we require that those devices have Google Play Protect. It is our security monitoring service which scans 100 billion app installs every day. Just in 2019, Google Play Protect removed 1.9 billion instances of malware and other security vulnerabilities from non-Google Play sources, just to give you a sense of the scale at which we are trying to attack this.

Senator OSSOFF. To be clear, Mr. White, and just given my limited time, I am referring to SDKs which perhaps should be classified as malware, but are not currently classified as malware. Do you agree that the data broker market is exploitive and abusive and that most of your users have no idea how much information is flowing to these data brokers?

Mr. WHITE. One of the things, Senator, that we take very serious is our responsibility to keep the users who come to Google Play for a safe and enjoyable experience, to keep them safe. That is why we have policies in place. If developers violate those policies, we review every app that is submitted to the Google Play store, whether it is a new submission or an update to an existing app before it is published. As Mr. Andeer said, similarly we have that. That is a combination of human review and automated tools. Even if we have——

Senator OSSOFF. Mr. White, will you kindly—will you please provide to this Committee within 30 days an one assessment of wheth-

er any X-Mode SDK malware or any other X-Mode SDK technology remains on apps sold on the Google store?

Mr. WHITE. Yes, Senator. I am happy to look into that and follow-up with your office with more details there.

Senator OSSOFF. I would like you to commit to providing that information, not just to looking into it, please.

Mr. WHITE. Sounds good, Senator. Will do.

Senator OSSOFF. Thank you so much. Finally, Mr. Cooper, thank you for joining us today. Mobile apps collect, use, and store a massive array of sensitive personal data. Do you believe we need legislation that would ensure that the privacy policies provided by app developers and app stores disclose in plain English that is decipherable to everyone all data collection practices, data storage practices, and third parties to whom such data might be sold?

Dr. COOPER. Yes. That was, in fact, the thrust of the second half of my recommendations because the demand side, it turns out, is as important as the supply side. If you liberate these folks, they will not get any place if the consumer does not have sovereignty. The idea of open, fair, actionable information provided to consumers, true consumer choice, is absolutely critical.

The interesting thing here is that this is one area in particular—there may be others—where it may not be the antitrust authorities who you want to do that because it is not the kind of thing they do. They do not engage in behavioral regulation. They actually avoid it as best they can. This is one area where you really need stand-alone legislation and we need to have a good conversation about who the regulators should be. We may not have any in our society. We may have to create a new office. We can look around, but there is no doubt that if you do not fix the demand side and the flow of information and give consumers back their sovereignty, which they have lost to these platforms, you will not get very far toward promoting competition.

Senator OSSOFF. Thank you, Dr. Cooper, and thank you, Madam Chair.

Chair KLOBUCHAR. Okay. Thank you very much, Senator Ossoff. Good job.

Before I turn to Senator Blackburn, just some submissions for the record from John Bergmayer, Charlotte Slaiman, and Alex Petros at Public Knowledge; from Morgan Reed at The App Association; from Bruce Gustafson and Sarah Richard at Developer's Alliance; from Meghan DiMuzio at the Coalition for App Fairness from Tech Freedom; from Arthur Sidney of the Computer & Communications—we must have a good hearing, Senator Lee. From Arthur Sidney at the Computer and Communications Industry Association; and from Professor Michael Jacobides at the London School of Business. I seek unanimous consent to enter these submissions into the record. Without objection.

[The information appears as a submission for the record.]

Chair KLOBUCHAR. Senator Blackburn.

Senator BLACKBURN. Thank you, Madam Chairman. Yes, indeed, it is a good hearing. I think that the witnesses see this is an area where there is a good bit of agreement.

Picking up where Senator Ossoff left off, you know, there is frustration with some of the Big Tech providers when it comes to the

issue of privacy and security. Dr. Cooper, I appreciate your remarks. One of the questions we ask is who owns the virtual you. Who owns the virtual you? Which is you and your presence online.

To Mr. White from Google, we are fully aware that you collect this information and then you monetize this information. The question is why should we trust that Google will not use this information to further entrench this data monopoly that they have going? Mr. White, why should we trust Google to not monetize this information and to benefit from it and will Google commit? Since you did not want to answer Senator Ossoff's question, I will pose it to you a different way. Will Google commit?

Will you commit in writing that you are not going to use any of this consumer data information to inform your other business lines and to not collect or store any information other than that that is necessary to facilitate the transaction that is taking place on your system? Mr. White, will you commit to that, that you are not going to capture and hold and utilize and monetize this information? That you are going to let consumers own their presence online. Are you ready to make that commitment to us?

Mr. WHITE. Thank you, Senator Blackburn, for the question. To your point around why should consumers trust us, that is the core thrust of our business model. We are an information company.

Senator BLACKBURN. Mr. White, that is really not the question. I am asking for your commitment. You ready to give it?

Mr. WHITE. Senator, what we do is we try to provide users with transparency, security, and control. We give them access to the data that is being collected and we give them the controls and they can decide.

Senator BLACKBURN. Sir, you are skirting the question, so I will reclaim my time. Let me go over to Apple. Apple seems to have two operating standards. There is one for doing business in America. There is a second standard for appeasing the Communist Chinese. Apple kicked Fortnite—and I am aware of Fortnite. I have two grandsons that are 11 and 12 and I have watched them play Fortnite. Apple decided to kick Fortnite out of the App Store over a fees dispute, but it lets TikTok stay on despite violating privacy rules. Apple will pull Hong Kong pro-democracy apps from its store when the Communist party demands that it pull it, but then it will not cooperate with the FBI to catch terrorists in America.

Madam Chairman, there is an excellent article on Apple's willingness to bend the knee to China in the New York Post. It is called "Is your iPhone Worth China's Tyranny." I would ask your permission to insert that into the record.

Chair KLOBUCHAR. Without objection. It is in the record.

[The information appears as a submission for the record.]

Senator BLACKBURN. Thank you. There is the Tim Cook-run Apple which turns a blind eye to Communist China's human rights abuses in Tibet and Zhejiang. Then there is the Apple of Hong Kong run by Jimmy Lai, who is willing to go to jail for a publication that fights for democracy. It is sad to see the Apple of the west speak up against injustice in America, yet stay silent when it comes to China's atrocities and the genocide they are carrying out against the Uyghur.

This month Apple is finally rolling out new privacy policies that claim to empower users and stop unwanted location tracking. I am concerned that Apple's Privacy By Design, as it is called, cannot coexist with turning a blind eye toward Beijing's behaviors. Last year, Forbes reported that Apple caught TikTok spying on users using the clipboard feature. Even now, TikTok is plotting ways to get around Apple's new privacy policies. Yet TikTok remains available to download in the App Store, putting iPhone users' privacy at risk. If Apple is imposing 30 percent for safety and security, does that mean Apple is also responsible for all costs related to breaches of safety and security on iPhones? Waiting for an answer.

Mr. ANDEER. Thank you, Senator. We take privacy incredibly seriously here at Apple. We have embedded technologies and features over the last 25 years to ensure that all of our products respect your security and respect your privacy. That guides our own products. That also is increasingly guiding our third-party developers and partners to make sure that your information, you understand who has access to it and you have control over it. That is true here in the United States, in China, and around the world.

Senator BLACKBURN. Okay. Alright. Still you are charging 30 percent for safety and security. When breaches occur, which is my question, are you responsible for all costs related to breaches of safety and security? I was not asking if you took it seriously. I was asking for your actions.

Mr. ANDEER. My apologies.

Senator BLACKBURN. Do you assume all of those costs? Then let me continue if—let me ask you this. Are you telling Congress and the world at large that you are charging this massive sum because this work is very difficult and that you do it well, that you have extraordinary security measures? If that is the case, why should you get all the money, but not take any of the responsibility for the breaches of safety and security on iPhones and iPads?

Mr. ANDEER. Senator, we have thrown open the gates of the iPhone to third-party development. From the very beginning, we have had a model to support that in terms of charging a commission for digital goods and services that supports all the technology, resources, and all the things that we pour into our developer program and to build the App Store. Part of that is security and privacy, absolutely. It is something that we will continue to invest in and continue to work on. We now have a marketplace in which we have 1.7 million apps. Eighty-four percent of them pay nothing. We are working tirelessly to create the best possible experience for both our customers and developers and part of that is privacy and security.

Senator BLACKBURN. Okay. I am running out of time, but thank you for the answer. Mr. Sine, I have a question to you that will relate to that. I will submit it to you for a written answer.

Chair KLOBUCHAR. You can ask him now. A few people have gone over.

Senator BLACKBURN. Okay. Thank you. Let me ask you with Match, you all have an app. How do Apple and Google use safety as a pretext for controlling what apps can or cannot do in the App Store and how do you see them selectively applying standards to disfavored apps? Because I cannot get a straight answer from ei-

ther of them. I have been listening to the hearing in my office and I have heard a lot of hot air and generalities and not a lot of specifics.

Mr. SINE. Yes, Senator. The reality for us is we do not see a lot in terms of safety that they are talking about that they provide to us. Again, as we mentioned, they do not even do the basic which you would think is limiting underage users from downloading our apps when they know that those users are underage. We have actually seen them, as I mentioned, in Taiwan block our app because we wanted to do ID verification. They have blocked other versions of our app because we wanted to do multifactor authentication, telling us that it was inappropriate for us to mandate two forms of identification in order to make sure that someone could access our app because we wanted to make sure it was the right person.

When Apple talks about the need for safety, security, et cetera, the reality is if it was really about safety, security, et cetera, in-app payment would be applied to every app on the platform, not just 15 percent, because we all have users.

Senator BLACKBURN. Thank you for the clarification. Mr. Gutierrez, I will come to you for a question written. I spoke to the House of Lords in the UK yesterday on a couple of things, so I will just send those to you in writing.

Madam Chairman, you were generous with the time. I think this shows exactly why we need to move forward with privacy, data security, antitrust, and Section 230 reforms in order to provide protection for consumers in the virtual space.

Chair KLOBUCHAR. Excellent. Thank you very much, Senator Blackburn. Senator Lee.

Senator LEE. Thank you, Madam Chair. When Senator Blackburn referred to the House of Lords a minute ago, I flinched a little bit because usually that is used as a denigrating reference to the Senate, but glad to know you were talking about the actual House of Lords.

Mr. Gutierrez, let us start with you in this round. A recent filing in the *Epic v. Apple* case contains some quoted discussions with Phillip Shoemaker, Apple's director of App Store review from 2009 until 2016. Shoemaker said that Apple had used the App Store "as a weapon against competitors" and has rejected or delayed competing apps on pretextual grounds. He further explained that although in theory an iOS developer that is unhappy with Apple could simply leave the iOS platform and perhaps write only for Android and compete only in that space. Although they say that, perhaps most app developers do not consider taking that step and therefore do not consider abandoning iOS to be a viable, realistic option.

My question to you is if developers cannot leave, if they feel that is not a viable option, even if they are being abused or mistreated, how would an operating system ever feel the need to change? Why would they change if they have got a captive group of people who have no place else to go or who cannot go?

Mr. GUTIERREZ. Senator, the reality is they will not do it out of their own initiative. They have to be forced to change. That is why we were the first company to actually publicly have the courage to come out and speak about these things. Then what has happened

since then is this debate has really blossomed. This debate has really happened across both sides of the Atlantic. You see companies come in front of you. A coalition that we helped found now has 55 members and continues to grow. It is only through companies speaking out about the real implications of their actions and legislators and government agencies and enforcement agencies looking into these issues that they are ever going to change. Otherwise they will continue to apply to this superficial pretext and continue to behave exactly in the same way that they have in the past.

Senator LEE. Okay. Something you just said made me remember a question asked by Senator Klobuchar to another witness earlier in the hearing when you talked about having the courage to talk about it. As a result of testifying today, do you feel fearful of retribution?

Mr. GUTIERREZ. Because we have a long history of engaging with Apple, I think they know better than to call us on the eve of our appearance here, but I—over the years, I can tell you right off the top of my head of at least four clear examples of threats and retaliation that we have faced with them from the very existential threat of being removed from the App Store because we had decided not to implement the payment system going forward to the clear statement to us that our app even though at the time was a top grossing app on the app, it would never be promoted on the App Store or receive any marketing because we were a competitor to changes, unilateral changes to the rules that retroactively outlawed things that we did to our products to having to wait sometimes months for our app updates to be approved even though they contained bug fixes and vulnerability fixes as well as a number of other things. They have basically thrown the book at us in a number of ways to make it hard for us to continue to sustain our decision to speak up.

Senator LEE. Thank you.

Dr. COOPER. Senator Lee.

Senator LEE. Yes.

Dr. COOPER. Let me make a point. You have raised the most important issue.

Senator LEE. I do not have a lot of time, so if you can quickly.

Dr. COOPER. One of the most important reasons, ways to get people to come forward is to have a Department of Justice they believe in that will listen to their complaints and carry them forward. That is exactly what your job is, is to create that kind of Department of Justice, because otherwise they are naked. When they have a Department of Justice, they can tell you what the problem is. They can say it in public. That is why it is so necessary to pass legislation.

Senator LEE. Mr. Andeer, Apple frequently cites the need to protect users' privacy and security. These are laudable goals. In fact, I am an Apple customer for that reason and many others. I appreciate Apple's sincere commitment not to sell my data and to protect my privacy, but how can competitors and customers and legislators and others be sure that security and privacy are not being used as a pretext to exclude competition as alleged by Mr. Shoemaker and the question that I asked a moment ago to Mr. Gutierrez?

For example, other documents in the Epic litigation that I referenced revealed that Apple's human review process typically took 13 minutes per app, 13 minutes for each app. That the lead engineer responsible for detecting fraud and abuse in the App Store analogized the review process to bringing a plastic butter knife to a gun fight. Meanwhile, it seems like apps that present potential competitive sort of threat to Apple are often delayed or blocked or disadvantaged. In other cases, apps that do not present those, but perhaps offer a differing viewpoint—I am referring here to Parler, suffer a different sort of fate. Anyway, back to the competing space, how can we ensure that your privacy and security protections are in fact narrowly tailored to help consumers while minimizing the impact on competition and that those concerns are not being used to shoehorn in anticompetitive behavior?

Mr. ANDEER. Senator, I appreciate the question. I think what we have is a 12 year track record that we can look back upon. What we have done consistently year after year, day after day, is think about how we can harden and secure our devices to make them the most secure in the marketplace, as study after study has found, and introduce new features to give you the power and the information you need to decide whether you are going to share your information or not with a particular developer.

In terms of what that track record also shows is over that 12 years, the App Store and everything that we have made available to developers has unlocked a tremendous amount of competition. If you look at our aps, and there is just a handful of them, they are a drop in the bucket of this ocean of 1.7 million apps. In each and every category you are going to see an alternative like Spotify or someone else who is doing better than our service. There is no advantage seen in the market. From my perspective, and I have been practicing in this area for 20 years, I always look to the market for answers. I look to see like what is happening. When we look to see what is happening, we see that competitors are not just doing well on iPhone. They are thriving.

Senator LEE. Now, wait. Is that what you are doing when you get publishers to fix prices of e-books? Is that the track record you are referring to, sir?

Mr. ANDEER. Senator, no, I am not. That is a different business in terms of selling e-books.

Senator LEE. It is a different business, yes, but it was anti-competitive. You are asking us to take your word for it here. We have got witnesses here telling us that they are scared, that they are intimidated. What is your response to that?

Mr. ANDEER. Senator, I would again look at our 12-year track record. If you look at Spotify, they have been downloaded from the App Store nearly half a billion times. We have processed dozens, hundreds of updates for them over the years. They built the market leading position in digital music streaming. If you look at Tinder and all the other brands it has acquired over the years, they have been downloaded hundreds of millions of times and we have processed thousands of updates. If you judge us by our track record, you will see that we have not just not engaged in this bad activity. We have been supporting these businesses. We are going to continue to going forward. There is no evidence of retaliation.

Senator LEE. When you get publishers to fix the prices of e-books, was that not part of your App Store business?

Mr. ANDEER. Senator, no, it was not. It was part of our iBooks business, our ibook store. Again, in that case, we were judged by the evidence. We may disagree with the outcomes, but we were judged by the evidence. That is all I am saying is you can look at the evidence of the App Store over the last 12 years and see that it has created some incredible economic opportunity.

Senator LEE. It is still a store. It is still a store on iOS devices.

Mr. ANDEER. Yes, it is, Senator, and it has been a store for nearly 12 years with the same basic business model. All we have done time and time again is reduce prices and reduce flexibility for developers to create their amazing applications for their customers.

Senator LEE. Madam Chair, I see I am dangerously over time. I apologize.

Chair KLOBUCHAR. No. That is okay. Do you have anymore? It is fine. Okay. Very good. All right. I have a few more questions here and then we will finish up.

Mr. Andeer, you have argued in the past and actually in testimony before the Arizona House of Representatives and in your written testimony that the 30 percent commission is not just a payment processing fee, but it also reflects, as many of the other Senators discussed with you, the secure app environment created by Apple and the fact that the App Store is like a studio for developers providing developer applications and APIs to help them build apps.

First of all, I guess my question is similar to what you have heard before. If that was the case, it seems like all developers benefit from the secure Apple environment and that all developers who enroll in the Apple Developer Program for $99 get access to App Store developer tools. What benefits in addition to payment processing do the developers who must pay the in-app purchase commission get? It sounds like all they get is payment processing as an inflated price. I am just trying to figure out the difference. You have had a discussion, of course, with Senator Lee about the difference between dating and getting a ride, which was fascinating, one I will never forget. You have had a discussion with Senator Hawley about why don't you just have the security fee charged or there is just no way this can cost 30 percent of what they bring in, the security piece of it. My question is again, what benefits in addition to payment processing do the developers who must pay the in-app purchase commission get?

Mr. ANDEER. Sure, Senator, and I appreciate the question. The model that we introduced along with opening up the iPhone up to third-party development 12 years ago was simple. We say, hey, if you are going to sell a digital good or service you are going to be subject to the commission. That supports all the investments and all the things we have done in terms of continuing to open up the iPhone and additional features and technologies. We have gone from 10,000 APIs to 250,000. We have launched frameworks and resources and software to make it incredibly easy for a developer to build a app. We have built a store that is now in 175 different countries with unique storefronts. We have an editorial team that features different applications and different developers.

There is an incredible amount of investment that we make into the App Store and the technology platform that supports the store. We recuperate that and we drive that from the commission structure. We think that has been a fair deal and that has proven out over the past 12 years in the form of we have got 1.7 million apps. We have got incredible rich array of content available to our consumers. We see this as a business that has been great for developers.

Chair KLOBUCHAR. Would not it be better for consumers if these guys were able to tell them that they could get cheaper rates somewhere else?

Mr. ANDEER. Senator, I absolutely agree and they all do. Spotify——

Chair KLOBUCHAR. Wait. Wait. Spotify can say, "Hey, you can get a cheaper rate on our website?" Can they say that on your app?

Mr. ANDEER. To be clear, Senator, Spotify can do that through one of its more than 8,000 partnerships. What it does in our app and what we say in our app, much like what Verizon would say to Apple if we said, hey, we want to come into the Verizon store and put a sign up that says, "go buy our iPhone down the street at the Apple store." They are not going to allow us to do that. No retail is going to allow us to do that.

Chair KLOBUCHAR. I think there is a difference with——

Mr. ANDEER. The App Store——

Chair KLOBUCHAR. Okay. I think there is a difference. Maybe, Mr. Gutierrez, you want to respond with that analogy, with where they are when they are depending on you for this App Store.

Mr. GUTIERREZ. I do. This is highlighting a really important point. Apple takes the position that our users are their users, that they own the customer relationship. They are injecting themselves in the middle of the relationship and they believe that they can control our communications with them, our offers to them, the promotions and benefits that we would give them. That is the heart of the problem here, which is this is a model where basically a handful of global gatekeeper platforms cannot claim that they own the user relationship of all the users of all the apps that are offered on the mobile platforms. That is the path that this approach is leading to, which is why it is so important that these issues are addressed.

Chair KLOBUCHAR. Yes. Dr. Cooper, I know you have not gotten too many questions, but you did not get a call last night not to testify, so I mean that is not what they said too.

Dr. COOPER. They might not have——

Chair KLOBUCHAR. They did not say that to Match.com, but they questioned their earnings statement, even better. You did not get a question like that, right? Okay. I guess I want to know from your perspective as someone who advocates on consumers' behalf. This issue that we were just talking about with Apple and with Spotify which is really an issue for everyone. Like it is that cannot advertise that you can get cheaper rates for their consumers. How does that affect consumers and how does the fee? Two separate things. The ban on telling them that they can get a cheaper rate somewhere and then the fee.

Dr. COOPER. If these folks could compete on a level playing field, it would have a benefit that has been missed here. That would put tremendous competitive pressure on the platforms. They would look out in the world and say, holy mackerel, we could lose all these customers to someone else who is treating them fairly. That would put tremendous pressure on the platform.

The second thing that could happen is that these folks could get together and say, you know what? We have got enough users to build our own platform and new entry. That was the logic of the Microsoft case, which in fact, if you go down the list of abuses you started with, is identical to the Microsoft case. How it is for 20 years we have not won the court cases and we have them now, is amazing. It is amazing how much they have done the same dirty old business practices. Those hurt consumers. We learned that a long time ago. Our best protection is real competition and this is a space in which we do not have it.

Chair KLOBUCHAR. Exactly. I bet you have been waiting to say that, Dr. Cooper, behind your mask all this time sitting there.

Dr. COOPER. I kept trying to find a way to get in.

Chair KLOBUCHAR. Okay. The House Antitrust Subcommittee Digital Markets Report cited estimates that Apple makes between $15 and $18 billion a year on the App Store, Mr. Andeer. According to Phillip Shoemaker, Apple's former director of app review for the App Store, it costs less than $100 million a year to run the App Store. That sounds like an incredibly profitable business and frankly, as was noted by several of my colleagues, those look like monopoly profits. How does Apple justify the 30 percent commission fee rate when the cost of running the App Store is so much lower than the revenues the company generates from the App Store?

Mr. ANDEER. Senator, I appreciate the question. As I have mentioned, Apple has invested significant sums in technologies, resources, tools to allow developers to build their apps far in excess of this $100 million figure that was——

Chair KLOBUCHAR. Okay. Then what is the correct number?

Mr. ANDEER. Senator, I do not have the exact figure. I know it is more than $100 billion that we have invested in iOS and iPhone.

Chair KLOBUCHAR. Do you know how much revenue it generated last year? I mean it is relevant because we are talking here about a monopoly situation.

Mr. ANDEER. Senator, understood. When we look at the App Store, it is not a separate standalone business for us. It is an integrated feature of our devices. We do not have a separate profit and loss statement for the App Store. What we do know is that the economic opportunity has been studied and assessed and we know that developers are creating apps, whether it is mobile advertising or selling physical goods or digital goods and content, that has generated more than $500 billion. I think you mentioned this in your opening statement. There is an incredibly economic opportunity that has been created for developers. On a very small percentage of those sales do we levy a commission.

Chair KLOBUCHAR. Okay. You have no numbers, which I am sure exist. We will try asking you in writing. I have no choice but to go with the House numbers because there is no other number on that

table and that it is $100 million a year to run the App Store and that you make $15 to $18 billion.

Mr. White, how much does it cost Google to run the Play store and how much revenue did it generate in the last full year?

Mr. WHITE. Senator, I do not have those exact numbers, but happy to follow-up with your team on that. What I can say though is with the Android ecosystem, the amount of competition and choice that that has brought to the mobile landscape, how it has brought down the cost of mobile devices. As I said in my opening statement, you can get an Android phone now for less than $100 bucks. In your opening comments you talked about accessibility and why it is important for people to have access to mobile devices. We think that is what Android has actually brought to this landscape. Almost 2 million American jobs that have been created by this ecosystem.

Chair KLOBUCHAR. Okay. I believe and I said very clearly at the beginning that I do not challenge the success. I am proud that we have developed these innovations in America, but you have to keep rejuvenating capitalism. You have to keep allowing new people to come up with new ideas. I am not going to go beyond this issue, but I think—well, maybe I will for 30 seconds. I think when you look at some of these purchases of Facebook and Instagram and WhatsApp and what has happened and then you look at all the problems we have had in terms of privacy and other things, that you are literally stifling—this is not about you, of course, but, in general, the tech companies are stifling some of the new developments we could see for privacy and other things by how this has all gone down. Then you have on top of that the issues for consumers.

I guess do you think, Dr. Cooper, listening to those numbers I just read out which are the only ones available to us, do you think that these companies are operating in a competitive market, Apple and Google?

Dr. COOPER. Actually, there are other numbers which are in one of the reports we will file with the Committee.

Chair KLOBUCHAR. Okay.

Dr. COOPER. I looked at the learner index for these two companies and it is way above the national average. They are overcharging consumers for their products and earning excess profits. These two companies in particular. There are other digital companies that were much lower and it turned out that they exist in marketplaces where they face much more competition. The absence of competition in that document, and I will call your staff's attention to it, is demonstrated to me that we are being overcharged and our prices could be lower and these folks are these ones who——

Chair KLOBUCHAR. None of the companies here before us are saying that this—in person here—are saying that this should be free, right? You are just questioning the amount of the charges, right?

Dr. COOPER. There should be a normal rate of profit on that line of business. As you have heard and you suggested, there is not. The only way they can keep that is if they exercise their market power and lock consumers out.

Chair KLOBUCHAR. Okay. Another related issue. Mr. Gutierrez, some developers have raised concerns about App Store operators

preferencing their own apps in App Store's searches so that their apps show up at the top of the search results. I remember a long time ago this issue raised in a different context by Senator Lee. Do you share this concern?

Mr. GUTIERREZ. Yes. This is just another manifestation of the complete control that they have and the fact that the decision on who gets promoted, who gets discoverable is really completely manipulated to help Apple's own services. This makes it really clear. We have heard Apple say a number of times about all the value that they brought to these apps including some of the services that are represented here. The reality, Senator, is that Spotify, and I can say the same thing probably for Match and for Tile, we are not successful because of what Apple has done. We have been successful despite Apple's interference. We would have been much more successful but for their anticompetitive behavior.

Chair KLOBUCHAR. Okay. Mr. White, what are the factors Google uses to display app results when a consumer searches for something in the Play store? Does it preference Google's own apps in the Play store? Has it ever done so?

Mr. WHITE. Absolutely not, Senator. We are an information company. Our core business model depends on users trusting us to provide accurate, unbiased information. We do not preference our first-party services over our third-party services in the Google Play store. We want when users come to the Play store searching for their favorite apps or games for them to find the most relevant information.

Chair KLOBUCHAR. Okay. Mr. Andeer, I have seen news reports that Apple has a 42 factor algorithm for how it displays app results when a consumer searches for something. Is that correct and which factors weigh most heavily in your algorithm? Does Apple preference Apple owned apps in the App Store searches? Has it ever done so?

Mr. ANDEER. Senator, I am not intimately familiar with our search algorithm in the App Store, but I do know that we do not favor our own applications or services in the search functionality. Again, I think if you look at the experience over the last 12 years, we have over half a billion users who have found and downloaded Spotify during that time. Same is true for a whole host of companies that compete with us. The objective evidence is, hey, consumers are finding what they were looking for, so no, we do not favor ourselves in search.

Chair KLOBUCHAR. Ms. Daru, do those answers give you comfort?

Ms. DARU. No. They do not.

Chair KLOBUCHAR. Why not?

Ms. DARU. Because we are hearing over and over things that are not consistent with our experience. For instance, earlier today, Mr. Andeer said that we could not talk about the MFI agreement because they were in negotiations with other developers regarding that agreement. We were told that basically we could not negotiate that agreement and that that agreement we had to sign as is, and in fact, that they are not going to give us any more information about this program unless we actually sign it. It is things like that that make me question some of the statements.

Chair KLOBUCHAR. Mr. Andeer, and I will ask this of both of you, I guess, Mr. White. A number of app related to this, a number of app developers have complained about a lack of transparency regarding the application of Apple's and Google's respective app store rules and policies. They have expressed frustration about often not knowing why an app or an app update has been rejected. For each app or update that is rejected or removed from the App Store by Apple, Mr. Andeer, will Apple commit to providing the developer of the app with a written explanation of why the app or update was removed or rejected in a timely manner including citations to the applicable Apple rules or policies under which the decision was made? Will you do that?

Mr. ANDEER. Senator, we do that today. We have guidelines and we have for 12 years. We are in constant engagement and discussion with developers. As I mentioned, we get 100,000 submissions each week. We have to reject 40 percent of those, whether it is for performance, safety, security, or some other reason. In each and every instance, we try to communicate what the issues are and we talk to thousands of developers each and every week.

Chair KLOBUCHAR. Uh-huh. Google, answers on that?

Mr. WHITE. Yes. Thank you, Senator. Very good question. Very similarly, that is generally our practice today. I will say one caveat to that is if there is a serious security violation we may remove that app more quickly just to make sure we are protecting our users and their devices. As I said, the Google Play Protect Monitoring Program scans 100 billion apps every day, right. If there is a major security violation we will take that app off of the play store very quickly and then communicate with the developer on what the violation may have been.

Chair KLOBUCHAR. Okay.

Mr. WHITE. Senator, whenever we do take enforcement actions like that, we do give our developer partners avenues for redress. They can appeal those decisions and they can have those decisions reviewed again. We make sure that our developers are in constant communication on how they can be in compliance with those publicly stated policies.

Chair KLOBUCHAR. Anyone anything on this? Want to respond, Mr. Gutierrez?

Mr. GUTIERREZ. Senator, our experience may illustrate a little bit of how this application of these rules actually happen in practice. It happened to us multiple times. When we decided to take IAP down, after Apple launched the competing service at a price below ours, we complied with the rules as they existed at the time which basically said we could not have a buy button or a link to a payment mechanism. We decided, Okay. We will take that. It will not be part of that.

Apple then came back and they said it is not just that we could not have a buy button in our app if we did not have IAP. We could not even email our users to tell them about a way to upgrade. We could not mention in the app that they could get a premium app. We could not tell them that that were discounts or promotional plans that they could sign on. Then what happened is the month after we did that after they had engaged in this extensive, expansive interpretation that was not supported by the rules, they

changed the rules to retroactively support the interpretation that they had started applying in our case. That is what total control of their ecosystem means in the case of Apple.

Chair KLOBUCHAR. Okay. Mr. Sine, and then I have one more question to you, Mr. Sine, and then I am almost done.

Mr. SINE. Sure. Our experience has been similar to Mr. Gutierrez. We have had situations—and it is not really that they do not tell you which rule you have violated. They do not tell you how you violated that rule or how to fix it. That is the problem. We had an app, one of our Tinder bills, that actually had a very important safety feature for our LGBT+ community where it would actually inform users when they were in a country where they might be at risk for exposing their gender identity or otherwise. That sat in the App Store review process for two months because Apple had said that we were violating a new policy or they said the spirit of the policy and could not tell us expressly how we needed to solve it in order to get that launched. We had to go all the way up to talking to the chief executives through our chief executive at IAC at the time in order to actually get that app unblocked two months later.

Chair KLOBUCHAR. Wow. Okay. Just to kind of pull this out from the trees to the forest here, so and I think, Mr. Sine, I will do this here with you. I think one of the things that people think—they hear all of this and they think, well, why don't you just sell it on your website then? Why do you need these guys? If they are doing this to you, why can't you just go and compete on the web on your own? Could you answer that?

Mr. SINE. Yes. Like I said at the beginning of my testimony, they have essentially taken the internet and moved it into the app stores. They have set up their gateways. They have set up their toll booths. You have got to pay the toll if you are a digital good and service. They give everybody else access onto the freeway. What we are saying is why isn't the freeway the same for everyone and why isn't everybody paying the same thing as they are traveling down the freeway? We have never gotten a good answer to that, Senator.

Chair KLOBUCHAR. Uh-huh. To me when I hear all this I think, okay, our laws are exactly the same that they were basically. Our competitive policy laws, our antitrust laws, even our privacy laws on the Federal basis are the same from back when whenever it was and whoever did it—we are not going to get into that—the internet started. That, in fact, we have seen this major change, major ecosystem change. We are just not as sophisticated as these biggest companies the world has ever seen who we are very proud of in many ways, but that are basically using that system. That leads a number of us up here to say we need to get changes. The first thing is we need to have the agencies be as sophisticated as they can, which is why Senator Grassley and I have the proposal of something we can do immediately. The appropriations process is more the end of the year.

To be able to change the fees for mega merges. This is across the board, not just tech. That we can get more money to the FTC and to the DOJ Antitrust. By the way, that was supported by the Trump administration, just like these lawsuits were actually brought by the Trump administration, which I have commended Meghan Doverheim over at DOJ Antitrust and former Chair of the

FTC Simon for doing and are now being continued by the Democratic administration, which is how some of these SEC suits, as you know, Dr. Cooper, have gone in the past. They have bridged administrations. We think that we need to get funding to really play them out like they should.

The second thing we could look at, in addition to my bill, which I am not going to go. It is 5:20 p.m. On the Competition and Antitrust Law Enforcement Reform Act, which ups the standards on exclusionary conduct and would really help us adapt to the world we are in. I cannot even call it a new world. We have been in it for quite a while and we have not done anything about it.

The other thing we could do, I know State lawmakers in Arizona, Massachusetts, North Dakota, which is not exactly a radical State. I was just over there with Senator Hoeven and the Republican Governor on a water project, but they are looking at this. My home State of Minnesota. They are looking at legislation on a State by State basis to regulate app stores. Some of you have been involved in these conversations. In your opinion, should we consider legislation on the Federal basis to regulate app stores and why?

Mr. SINE. I 100 percent agree that that would be the right course of action. The reality is, as I said in my opening statement, this mandatory in-app payment structure, the way they have this set up, that is the lifeblood of their monopoly. It is their lifeblood to get the data from their users. It is their lifeblood to fund all these excess profits they are getting. It is their lifeblood to be able to identify what competing apps are and who their users are, how much they pay, when they pay, everything. If you cut that off, and the reason they are fighting so hard to defend it, the reason they went in and hired every lobbyist in the State of Arizona to defeat it——

Chair KLOBUCHAR. Probably not everyone.

Mr. SINE. Everyone but the one we hired.

Chair KLOBUCHAR. Okay.

Mr. SINE. The reality is they are fighting so hard because it is core to the maintenance of their monopoly.

Chair KLOBUCHAR. Okay. Anyone else want to take that?

Mr. GUTIERREZ. Senator, I would just add that in addition to the appropriations process that you mentioned and in addition to the bill, we actually—the broad bill that you have proposed, we actually think it is important to pair that with more specific legislation on app store issues the way that some of the States are taking this legislation. We think this is an action that is important for Federal preemption. These markets are not only national, they are global. These decisions that are made in Cupertino are decisions that affect our business in Indonesia and all over the world, so this is a space in which specific legislation on the app store issues would be very welcome and very beneficial.

Chair KLOBUCHAR. Dr. Cooper.

Dr. COOPER. Senator, as soon as you get a bunch of States considering this legislation, these guys will come running to you and say, "you have got to give me Federal legislation. I cannot have 50 States."

Chair KLOBUCHAR. I have experienced this before in other contexts, yes, but.

Dr. COOPER. Yes. They will want it and they will figure they have a better chance to negotiate with you than the individual State.

Chair KLOBUCHAR. You mean this Subcommittee? I do not know about that.

Dr. COOPER. This is the place, remarkable bipartisan. This is the place to fix the key things about the antitrust.

Chair KLOBUCHAR. No, no, no. I know. This is the place where we should fix them. Okay.

Dr. COOPER. Yes.

Chair KLOBUCHAR. Okay. Ms. Daru.

Ms. DARU. I just wanted to reiterate what Mr. Gutierrez said about having a specific app store bill just because the mobile phones are the gateway to so many aspects of our lives, banking, news, dating, music, health, fitness. Clearly, there are abuses that have been exposed today and in the House report that need to be addressed. We are concerned that if we wait for sweeping legislation or legislation that may need to be hold out in the courts over several years to understand what the impact is to the mobile ecosystem, we could have more irreparable damage done to competition and innovation in America.

I do want to commend you and your bill because it is a great step in the right direction. We absolutely need strong prohibitions against exclusionary behavior and discriminatory behavior, but would just respectfully request that some consideration be given to an app store-specific bill.

Chair KLOBUCHAR. Right. I mean everything we are looking at, the newspapers allowing too because of what happened in Australia, what is happening right here in other news organizations to combine their bargaining power. This idea of an app store bill, some of the gateway bills. I still believe, and I am the author of the newspaper one and I am going to work really hard to get it done this year. Just like you are talking about, I do not think we can wait. The best thing would be to admit that we have a huge monopoly problem here across the board and to just put in some stiffer rules and standards.

There is a number of Republicans right now, as I speak, that are with me on this too even though they are not on my bill yet, but on pieces of that bill, to be able to make it easier to bring these cases. That way then some of this behavior stops even if they are never brought in a case because people know that it is a real thing. It is going to happen if they keep acting like that. That is not just mergers going forward. It is also looking back at exclusionary conduct as well as some of the other violations we have talked about.

Senator Lee, do you want to close with anything?

Senator LEE. No. Thank you very much for holding this hearing. Thanks to each of you for being here and very informative.

Chair KLOBUCHAR. Uh-huh. Right. Exactly. Our two witnesses from Apple and Google, do you want to—I should give you an opportunity if you want to say anything about legislation and the like.

Mr. WHITE. Yes, Senator Klobuchar, and thank you. You are asking very important questions, particularly as it relates to funding

of the enforcement agency, so we will be happy to engage with you and other Members of Congress as you work through these issues.

Before I wrap this answer, I would like to say that each of the members on the panel here, the companies that are represented, are important partners of ours and they are raising issues. From where we sit, Senator, we are trying to keep—at an ecosystem level, we are trying to keep the cost low for the ecosystem and keep our prices competitive with the numerous distribution channels that developers have available to them in this very dynamic industry. I do worry that that may be difficult to do if in an effort to satisfy a very small but vocal set of primarily large companies, we damage the very foundation that has allowed the Android open source ecosystem to work so well for a much larger set of small and medium size business. That that is the risk and that is what we would want to engage with your office and other Members of Congress on as you tackle these very important questions.

Chair KLOBUCHAR. Mr. Andeer.

Mr. ANDEER. Senator, again, thank you for giving us the opportunity to participate today and share our perspective on this. When it comes to proposals, I spent a decade of my career in Federal Antitrust Enforcement, both with the Federal Trade Commission and the Department of Justice. I have a deep respect for what their role is and their job each and every day and an understanding of how difficult it is, so I am certainly a supporter for doubling and tripling down in terms of resources for those men and women that carry out a really important role each and every day.

In terms of other issues, I have long appreciated your championing of competition. I recall when I was at the FTC you raising issues around pharmaceutical mergers and other things that we took a very careful look at, so I have always been very appreciative of your interest in this area and we look forward to engaging with you in the future.

Chair KLOBUCHAR. Okay. This has been quite informative I think for everyone and I think the facts that we have gathered here today are going to be useful for us for legislation, for—the Justice Department just today or this week. We have the top two positions filled with the third one on the way in the Justice Department, we have the FTC Commissioners being nominated, hearings. I was just at a hearing in Commerce for one of the nominees. There is a lot happening and a lot of interest from the administration.

I do want to just tick through this just from my perspective. We have got a situation where we have got the fees that are higher than I ever imagined. I was looking at furniture stores and I could not figure out why one major one was not on the app store. That was about 3 weeks ago. I understand because they just probably decided I am not going to pay this high a fee. Because I thought, "Did they do something wrong? Why aren't they—why can't I access this on my Apple?" It is literally what I thought. I thought, "Oh, maybe they do not have one or maybe I just do it this way." I just think there is something pretty messed up about this because, as you said, it has kind of taken over the internet in that way.

The second point is this idea of which we have to look further into, but self-preferencing and competing, having direct competition

of their own products. The third one is just this idea that consumers are literally—that companies are being banned from telling consumers that they can get a better deal. When they are on a monopoly, the only way they can be on and get to those consumers in a big way is through one of these two app stores, which are on different platforms. Obviously people use those platforms for different reasons, but they each dominate those platforms.

As I hear the arguments that I have heard today, point one, this argument that a lot of them pay nothing. That is great. That still does not inoculate a company from liability for anticompetitive conduct. We just have to remember that. There is ways you could structure this, obviously. Regulators, my guess, are going to have to get involved. You would not be hurting all the small apps, the little apps out there, but you are just making this so that people are not hurt by monopoly conduct.

Second, we need to protect. One of the arguments we get is the security argument, more so I think from Apple, lesser extent from Google, because it allows sideloading. Of course we have to protect security and privacy. I think some of the arguments here made were there has got to be a better way to do this than a 30 percent charge for it or requiring apps to use only your in-app payment processor without barring developers from telling consumers. There is no way that telling consumers about a cheaper rate is going to affect consumer. You are just telling them, hey, you can also go over to this website.

Third point made that the App Store is built by them and they put incredible work into it is true, so now they get to run it the way they want. As been noted, those were the arguments made in the past. That is I am sure what Standard Oil said. I was not there back then. I am sure that that is what AT&T said for sure. They had a horizontal and vertical monopoly. They put all this in. They produced all this great stuff. I know because I represented MCI shortly after that breakup and as they were trying to get into local monopolies and to try to compete in that market. I saw, despite this claim that the world was going to fall apart, in fact, the chairman of AT&T after all this went down said they were actually a stronger company because of it because they were forced to compete. We saw lower long distance rates and we also saw this incredible launch of a cell phone industry, which when you go back to the beginning was nothing but cell phones the size of Gordon Gekko's in the movie "Wall Street" at the very beginning.

I just do not think this, we built it, so trust us and we can run it, is going to work anymore because if you look at history as a guide, of course people build things and they do great things. They employ a bunch of people. Then at some point it becomes a monopoly and then it becomes a problem as Adam Smith warned. Then we are supposed to be doing something about it without necessarily, of course not getting rid of these companies. We want these companies. It is just a question of how you ensure that everyone that works, that the companies that work or that are present in the capitalist system can do their bidding so that we actually have a capitalist system.

The point number four, our app stores create jobs for many small entrepreneurs. We heard this. That is great and those are great

things. Fostering innovation in that way is important, but again, it is not an inoculation. Another way you really foster innovation is when you allow companies that get to a certain point where they actually can compete. We will never know if Instagram could have competed against Facebook because they bought them because they viewed them as disruptive, to use Mark Zuckerberg's own word.

That is the same thing here. I do not think you can just say, well, just because someone is a little more in our line of business, online dating compared to car rides, well, that is different than or some music or your products with Tile. I just think that there is not a coincidence that the three of you are before us today because of the fact that that is getting into their business. I just do not see this differentiation as Senator Lee so well pointed out.

With that, I will keep the hearing open for 2 weeks. I just made that up. We will keep the record open for 2 weeks and we look forward to following up on all of this. We thank all of our witnesses for being with us through a lengthy hearing and we look forward to working with you. The hearing is adjourned.

[Whereupon, at 5:33 p.m., the hearing was adjourned.]

[Additional material submitted for the record follows.]

A P P E N D I X

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Testimony of
Kirsten Daru
Chief Privacy Officer and General Counsel for
Tile, Inc.

Antitrust Applied: Examining Competition in App Stores

Before the Senate Committee on the Judiciary
Subcommittee on Competition Policy, Antitrust, and Consumer Rights

Washington, DC
April 21, 2021

Thank you, Chairwoman Klobuchar, Ranking Member Lee, and the members of the Subcommittee on Competition Policy, Antitrust, and Consumer Rights for convening this critical hearing on the app ecosystem. I would also like to commend the members of the subcommittee and your staff for the commitment that you have shown to promoting competition in the digital marketplace.

Introduction/Executive Summary

My name is Kirsten Daru, and I am the General Counsel and Chief Privacy Officer of Tile, Inc. Tile is a Silicon Valley-based software and hardware manufacturer that creates products that allow consumers to find lost items, and we are one of numerous similarly situated companies that have been impacted by anti-competitive practices on the Apple platform.

Specifically, I'm here to talk about Apple's systemic abuse of its market power and platform dominance that has stifled innovation and competition in this country and around the world. The abuses that have unfolded over the years have negatively impacted innumerable developers and consumers of the Apple App Store. Yet, few feel comfortable speaking up about their experiences for fear of retaliation or retribution by Apple.[1] Indeed, speaking up has been difficult for us too. Apple exercises absolute control over its app ecosystem, thereby controlling the fate of all those who seek to innovate in that space.

I was honored to testify before the House Judiciary Committee, Antitrust Subcommittee in early 2020 about Tile's experience with Apple.[2] Tile was gratified when the House Majority and Minority Reports later that year validated nearly all of the concerns we had expressed, coming to the conclusion that Apple's exploitation of its dominance over the app ecosystem provides it with an anticompetitive advantage over Tile.[3]

Fast forward to now, and things are worse. Far worse. Apple's anticompetitive conduct has continued unabated despite the House findings, despite our many attempts to work with all levels of Apple's organization to find solutions.

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[1] *Investigation of Competition in Digital Markets: Majority Staff Report and Recommendations.* Subcommittee on Antitrust, Commercial and Administrative Law of the House Committee on the Judiciary. Oct. 6, 2020. [hereinafter House Antitrust Report], p. 27, https://judiciary.house.gov/uploadedfiles/competition_in_digital_markets.pdf?utm_campaign=4493-519

[2] *Online Platforms and Market Power, Part 5: Competitors in the Digital Economy: Hearing Before the Subcommittee on Antitrust, Commercial and Administrative Law of the House Committee on the Judiciary,* 116th Congress (Jan. 17, 2020), statement of Kirsten Daru, General Counsel and Chief Privacy Officer, Tile, Inc., https://docs.house.gov/meetings/JU/JU05/20200117/110386/HHRG-116-JU05-Wstate-DaruK-20200117-U1.pdf

[3] House Antitrust Report, p. 358; see also *The Third Way.* Minority Report. Subcommittee on Antitrust, Commercial, and Administrative Law of the House Committee on the Judiciary. Oct. 6, 2020, pp. 4-5. https://buck.house.gov/sites/buck.house.gov/files/wysiwyg_uploaded/Buck%20Report.pdf

Today, we are here to tell the rest of our story; a story that has far reaching implications for the future of app innovation and consumer choice. These implications all stem from Apple's ongoing abuse of its platform dominance to put competitors at a sharp competitive disadvantage, and specifically include:

- Apple's propensity to replicate apps on its platform, with access to competitively sensitive data garnered through its platform and app store operation to build optimal competing software;

- Apple's intent to create a closed ecosystem that "hooks" consumers in and deprive them of choice;

- Apple's rampant self-preferencing of its own apps and services (while replicating competitors and/or denigrating the user experience of competitive apps) to artificially restrain or prohibit competition by reserving information and technology for use in its own products; and

- Apple's demonstration that it will not change its anticompetitive behavior absent regulatory intervention.

This subcommittee has before it a unique opportunity to address Apple's exploitation of its unbridled market power in the app ecosystem to develop and enact updated antitrust legislation that prohibits artificial restraints on competition in the tech sector and elsewhere. Apple's significant hold on the app ecosystem makes regulation difficult, yet the need for updated antitrust legislation in the short term is paramount. Without statutory action, ongoing innovation, fair competition and consumer choice in the mobile app store markets will suffer.

The Sherman Antitrust Act passed in 1890. American antitrust laws did not contemplate--and certainly have not kept pace with--changes in the digital marketplace. The United States has long been the world leader in tech innovation. Likewise, the US should be the world leader in antitrust innovation, in order to foster the ongoing vitality of our tech sector.

If we wait, the dominance and market power of Apple will only grow, making enforcement and regulation even more difficult than it is today, to the lasting detriment of competition, innovation and consumer choice.

We acknowledge that Google has the same power in its own app market, although our experience to date suggests that in the App Store context, Google has thus far exercised its dominance in a more benevolent manner. However, the structural imbalance still remains and there is nothing preventing Google from changing its behavior at a moment's notice. Accordingly, any new laws should apply to both equally.

About Tile

Tile helps people find lost items. People spend on average 365 days of their lives searching for lost items, and Tile was founded to solve that universal pain point.

In particular, we developed a finding service powered by software and hardware that helps people find lost items such as their keys, wallets, remote controls, purses, etc. Our Tile devices come in many form factors--even a credit card-sized device--that seamlessly attach to most anything. They work with our Tile app, which provides a user-friendly interface to help keep track of your belongings. We also embed our software into third party products like headphones, laptops and wearables.

Tile pioneered this category, and we lead the sector in the face of significant competition from a broad range of competitors ranging from other start-ups to Fortune 50 companies. Our apps have earned high ratings and a loyal consumer base. In fact, earlier this month, our Tile Mate product was named best Bluetooth finder by New York Times Wirecutter.

Much of our success also relates to the interoperability of our technology with a broad range of consumer platforms. We believe that consumers should be able to have a seamless finding experience interoperable with whatever devices and technology that work best for them. You can install the Tile App on your Android phone, your iPhone or iPad, and can even find your items with all the major voice assistants thanks to integrations with Alexa, Siri and Google Assistant.

Tile's Experience With Apple

Tile and Apple originally had a mutually beneficial, symbiotic relationship. We launched our iOS app in 2013, Apple distributed our products in its stores beginning in 2015, and we were regularly featured as a top app on the App Store. In the initial years of our partnership with Apple, we'd had the good fortune of investing in innovative new experiences with the company. For example, at Apple's 2018 Worldwide Developers' Conference (WWDC), our Siri integration was featured on stage during the keynote.

In 2019, however, our relationship with Apple took a very sharp turn in a different direction. A number of things happened unexpectedly in short succession that were uncharacteristic of our relationship to date, and signaled the anticompetitive challenges ahead:

- Reports started surfacing that Apple was going to release a competing software and hardware product;

- In the midst of planning our Apple store assortment for the 2019 holiday period, we were summarily and without explanation kicked out of all physical Apple stores;

- Apple hired away one of our star engineers who had been required to be on site at Apple for an extended period to co-develop the Tile/Siri integration that had been revealed during WWDC;

- Shortly thereafter, a new FindMy app was introduced with iOS13 that included Tile-like features.[4] FindMy is installed by default as part of its operating system on all Apple phones, and cannot be deleted;[5]

- At the exact same time that it was tying this new finding capability to its operating system, Apple made changes to its operating system that denigrated our user experience, in sharp contrast to their new capabilities that had been seamlessly integrated into its operating system;[6]

- Apple started sending Tile customers confusing prompts encouraging our customers to essentially turn off Tile. No corresponding prompts to turn off FindMy were sent to Apple users;[7]

- Tile invested significant development cycles to address the unexpected issues caused by Apple's changes and attempted to engage with the company's leadership to no avail.

I was honored to testify about our experience in January 2020 before the House Antitrust Subcommittee. In response to the hearing, Apple announced that they would reverse course on some of the changes that negatively impacted Tile (i.e. by bringing the "Always Allow" prompt back to the initial permissions set up). Its statement read in relevant part:

> *We're currently working with developers interested in enabling the "Always Allow" functionality to enable that feature at the time of set up in a future software update.*[8]

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[4] In iOS 13, Apple introduced offline finding, which helps find lost devices even if they're not connected to the Internet via networked Bluetooth community crowdsourcing nearly identical to Tile's solution. Albergotti, Reed. "Apple says recent changes to its operating system improve user privacy, but some lawmakers see them as an effort to edge out its rivals." The Washington Post, Nov. 26, 2019. https://www.washingtonpost.com/technology/2019/11/26/apple-emphasizes-user-privacy-lawmakers-see-it-an-effort-edge-out-its-rivals/, accessed 01/13/2020; see also The Verge, "9 apps and products Apple copied for iOS 13 and macOS Catalina" https://www.theverge.com/2019/6/4/18651190/apple-ios-13-mac-os-catalina-third-party-apps-products-copy-wwdc-2019.

[5] Albergotti, Reed. "Apple says recent changes to operating system improve user privacy, but some lawmakers see them as an effort to edge out its rivals." The Washington Post, Nov. 26, 2019. https://www.washingtonpost.com/technology/2019/11/26/apple-emphasizes-user-privacy-lawmakers-see-it-an-effort-edge-out-its-rivals/, accessed 01/13/2020

[6] *Id.*

[7] *Id.*; Haggin, Patience. "iPhone Update Reminds Users – Again and Again – of Being Tracked." Wall Street Journal, Dec. 31, 2019. https://www.wsj.com/articles/iphone-update-reminds-usersagain-and-againof-being-tracked-11577799336, accessed 1/10/20

[8] Potuck, Michael. "Tile Goes to Congress to battle Apple before AirTags competitor even gets unveiled." 9To5Mac, Jan. 17, 2020, quoting Apple's statement to CNBC in response to Tile's testimony. https://9to5mac.com/2020/01/17/tile-apple-antitrust-opening-statement

Apple did not follow through on this commitment.

Later in 2020, when the House reports regarding their investigation of Big Tech were released, we were gratified that the House agreed with and validated each and every one of our antitrust concerns. We were hopeful that Apple would make changes to address the House's concerns.

Apple did not.

Since Tile's Testimony In January 2019, Apple Has Made Matters Worse

The House reports have seemingly done nothing to deter Apple's behavior. Since Tile's testimony, Apple has continued to exploit its market power in its own favor to the detriment of Tile. For example:

- Instead of restoring the "Always Allow" permission to the first launch of the app, Apple made further changes to our user flow that only added confusion and required our engineers to spend several cycles addressing.[9]

- After we explained that we fit within exceptions to their requirement to use Apple's in-app purchase mechanism for our digital subscription (and thus are not subject to the 30% Apple payment processing fee), they disagreed ***for reasons that aren't in their guidelines.***[10]

- Apple announced their competing hardware product, AirTags, available April 30.[11]

- Apple AirTags will use a technology called Ultra-Wide Band (UWB) which can enhance the finding experience by adding additional precision.[12] Whereas Bluetooth can tell you which room an item is located in, UWB can tell you precisely where it is in that room. Apple has not given Tile access to the technology to use for the benefit of its customers, despite repeated requests.

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[9] See *Tile Responses to Questions for the Record*, available at https://judiciary.house.gov/calendar/eventsingle.aspx?EventID=2386.
[10] Section 3.1.3(e) of Apple's Developer Guidelines say: "[I]f your app enables people to purchase physical goods or services that will be consumed outside of the app, you must use purchase methods other than in-app purchase to collect those payments, such as Apple Pay to traditional credit card entry." The majority of Tile's subscription service provide goods and services consumed outside the app like battery replacements, extended warranties and lost item replacement. Apple still insists that Tile use Apple in-app purchase because those goods and services come with additional digital services, a distinction that is not in the Developer Guidelines.
[11] Warren, Tom. "Apple announces $29 AirTag, a new Tile-like item tracker." The Verge, April 20, 2021. https://www.theverge.com/2021/4/20/20844326/apple-airtags-bluetooth-tracker-keys-tile-features-price, accessed April 20, 2021.
[12] *Id.*

- AirTags will also use a seamless onboarding flow that allows connection to phones without even opening the FindMy app. This flow is unavailable to competing products;

- Apple otherwise continues to ignore our suggestions for a level playing field.

Most importantly though, Apple has slowly unveiled its true intentions: to enhance its closed ecosystem by edging out rivals at the app level in the finding space. The recently launched "FindMy Network Accessory Program" was originally couched in the media as a pro-competitive concession to Tile's concerns, whereby third parties like Tile could enjoy the same rights and privileges as Apple's FindMy App, including access to Apple's "Finding Network" (i.e. encrypted location data from Apple's installed base of iOS devices that are using bluetooth to locate devices not otherwise connected to the internet via wifi or cellular connections).[13] But the fine print reveals something VERY different:

- A condition of consumers getting the benefit of the Apple Finding Network is that we abandon our own finding network and app and direct our users to Apple's FindMy App to locate missing items.[14]

- To add insult to injury, in order to enjoy the "benefits" of the Apple Finding Network, competitors have to agree to one-sided terms contained in the MFi (Made for iPhone) Agreement whereby we give Apple unprecedented control over our business. In fact, we were told recently that we needed to sign this agreement to even get up-to-date information about what the program entails. Unfortunately, we can't reveal the details of the agreement because Apple considers it "Confidential Information" protected by our non-disclosure agreement.

The bottom line is that the FindMy Network Accessory Program deprives customers of the choice to use the same data and APIs used by Apple for FindMy to power Tile features. Apple could easily grant Tile customers access to that same data if they were interested in fair competition.[15]

In other words, Apple has once again exploited its market power and dominance to condition our customers' access to data on effectively breaking our user experience and directing our

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[13] Albergotti, Reed. "Amid Antitrust Scrutiny, Apple Makes Quiet Power Moves Over Developers," Washington Post. https://www.washingtonpost.com/technology/2020/07/24/apple-find-my-competition/; Statt, Nick. "Apple Opens Up Its Network of iPhones to Help You Find Tile-like lost Gadget Trackers," The Verge. https://www.theverge.com/2020/6/22/21299712/apple-find-my-iphone-network-third-party-devices-support-location-tracking; Bradshaw, Tim. "Apple Makes Concessions to Developers At Annual Conference," Financial Times. https://www.ft.com/content/3d2adf55-29f4-4459-ae50-8d74ed9b6a1e.

[14] House Antitrust Report, p. 358, fn. 2273 (citing the FindMy Network Specification).

[15] Apple could enable this by allowing our devices to beacon the FindMy format/API. The data would be encrypted such that only the customer could access his or her location information. Tile would not have access, rendering privacy a non-issue. This would work similarly to the way that it allows other similar finder companies to reveal location data, but it would just appear to the user in the Tile app rather than FindMy.

users to FindMy. To be clear, this move ***disincentivizes*** competition at the app level. And it's working. One competitor, Chipolo, has already announced that its newest devices will be available ***exclusively within FindMy.***[16]

Furthermore, joining the FindMy Network Accessory Program would break the interoperability that ensures our customers have a seamless finding experience no matter what technology they choose to invest in. It would break our user experience, render some of our features inoperable and render our customers unable to ***choose*** to use FindMy data to enjoy the unique features and interoperability of Tile. And this is relevant to Apple's true intentions.

As the House Antitrust Subcommittee's investigation reveals, Apple gives its own products and services a leg up over the competition and builds features into its products and services that can only be realized if you pair it with other Apple products. For example, Apple's public APIs default to Apple's pre-installed applications.[17] As a result, when an iPhone user clicks on a link, the webpage opens in the Safari Browser, a song request opens in Apple Music, and clicking on an address launches Apple Maps.[18]

In the context of the Epic litigation, an Apple employee admits that their goal is to create a closed ecosystem that "locks" consumers in and makes it hard to leave.[19] FindMy Friends is in fact mentioned as an app that is part of that strategy, designed by Apple to work exclusively with iOS.[20] Tile is the antithesis of that vision, believing in an open Internet and enabling consumers to seamlessly move across consumer platforms. With that in mind, it's not surprising that Apple has done an about face and used its market dominance to disadvantage Tile.

Implications of Apple's Behavior

Apple owns and controls the entire commercial iOS ecosystem. They own the hardware, the operating system, the retail stores and the app store marketplace. This gives Apple access to competitively sensitive information, including identity of our iOS customers, subscription take rate, retail margins and more. And Apple's control over the ecosystem generally enables it to

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[16] Apple, Inc., Newsroom. (2021, April 07). Apple's Find My network now offers new third-party finding experiences [Press release]. Retrieved April 08, 2021, from https://www.apple.com/newsroom/2021/04/apples-find-my-network-now-offers-new-third-party-finding-experiences/

[17] House Antitrust Report, p. 353.

[18] *Id.*

[19] "Findings of Fact and Conclusions of Law Proposed by Epic Games, Inc." Epic Games, Inc. v. Apple, Inc. (US District Court, Northern District of California, Oakland Division. April 07, 2021). [hereinafter Epic Games Findings of Fact and Conclusions of Law], paragraphs 53 and 58, pp. 14 and 15. https://www.scribd.com/document/502036985/21-04-08-Epic-Games-Proposed-Findings-of-Fact-and-Conclusions-of-Law#from_embed

[20] *Id.* at paragraphs 55 and 59, pages 14 and 16; *See also* Albergotti, Reed. "Amid Antitrust Scrutiny, Apple Makes Quiet Power Moves Over Developers," Washington Post ("Another limitation imposed by the Find My network is that, by cutting off the ability of customers to simultaneously use other services o control hardware devices, Apple is blocking them from connecting to other devices on Android phones. That's because Find My is only available on Apple devices."); https://www.washingtonpost.com/technology/2020/07/24/apple-find-my-competition/.

identify any successful app category and take it over by manipulating the ecosystem to give itself a sharp competitive edge.

Apple has done this in one way, shape or form to categories like screen time apps, flashlight, news, email apps and music, to name a few.[21] And all the while, these smaller competing app developers line Apple's pockets with as much as thirty percent of their digital revenue to help fuel more anti-competitive behavior. If left unchecked, Apple will become a 3, 5, 10 trillion-dollar company, while countless other viable competitors will be unfairly marginalized and harmed. Innovation will continue to suffer and consumers will ultimately be left with all of the cornerstones of an unchecked monopoly: less choice, lower quality and higher prices.

At Tile we always have and always will welcome fair competition. Competition fuels innovation, keeps quality high while ensuring the lowest possible prices for consumers. When a platform like Apple decides to enter a category and use its platform position to advantage its own service while disadvantaging third party services like Tile, this is patently **unfair** competition. The good news is that the House Antitrust Subcommittee considered this precise question and agrees: "Apple's [FindMy Network] solution would continue to put Tile and other apps and hardware developers offering finder services at a competitive disadvantage."[22] But it hasn't stopped Apple from proceeding with its anti-competitive conduct.

Perhaps even more importantly, if Apple turned so abruptly on Tile after such a close beneficial relationship, it could turn on **anyone.** In fact, I can confidently say it CAN and WILL. Apple's behavior today doesn't necessarily reflect its actions tomorrow. Its power is so vast that it could set even higher in-app payment processing fees, give itself even more discretion to cherry pick apps to include and exclude from its app store and impose even more disparate restrictions on competition.

Apple has also shown no intent of changing unless they are forced to change. Current antitrust legislation could take decades to resolve these critical issues and by then our prediction is that it will be too late as damage to competition and innovation in our country will be irreparable.[23]

Apple's Excuses

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[21] The Verge, "9 apps and products Apple copied for iOS 13 and macOS Catalina," https://www.theverge.com/2019/6/4/18651190/apple-ios-13-mac-os-catalina-third-party-apps-products-copy-wwdc-2019; Albergotti, Reed. Washington Post, "How Apple uses its App Store to copy the best ideas," https://www.washingtonpost.com/technology/2019/09/05/how-apple-uses-its-app-store-copy-best-ideas/.

[22] House Antitrust Report, p. 358.

[23] Andeer, Kyle. Letter from Apple, Inc. for the Record. Letter written February 17, 2020 to House Judiciary Committee. [hereinafter Andeer Letter] https://docs.house.gov/meetings/JU/JU05/20200117/110386/HHRG-116-JU05-20200117-SD004.pdf (Per Apple, the app industry employs 1.9 million people in the United States. But the industry is in decline.); House Antitrust Report, pp. 18, 47, 48, 50. (Venture capitalists are less willing to invest in new market entrants. And there is a decline in the number of startups and the "lack of competitive pressure in the US economy has reduced innovation and business formation.")

Apple's responses to our concerns have changed over time. None of them hold water.

1. ***"FindMy is part of the OS"***[24]

In a move that harkens back to the browser wars of the 80's, Apple originally said that FindMy could enjoy additional rights and privileges because it was "part of the OS."[25] Apple quickly moved away from this argument.

2. **Privacy**

In a common refrain in response to concerns about Apple's anti-competitive conduct, Apple claims that prohibiting or impeding competition on its platform is necessary to ensure the privacy and security of Apple users.[26] Tile holds privacy and security in the highest importance. A service like ours can't be successful unless we take the necessary steps to safeguard our consumers and their data. We are aligned with Apple's position on this. But Apple also uses privacy as an excuse for its blanket restraints on competition. The most obvious example of that is the following.

Nowhere does Apple say: "If an App Store or payment method can meet these certain reasonable and objective standards for privacy and security, then they may compete with us." Instead, the rule is: "No app store or payment method may compete with us." The blanket prohibition on competition has no reasonable nexus to privacy or security. There are many third party sellers and payment methods with excellent privacy and security practices. And the policy isn't consistent with Apple's own policy on Mac's or even for excluded assets purchasable on the iPhone, where it's perfectly fine for customers to purchase from any online merchant using any form of payment they choose on iOS or otherwise. The existence of third party payment mechanisms hasn't disrupted the integrity of the Apple ecosystem.

Same holds true for Tile. We and many other developers are subjected to different rules, constantly changing interfaces and unequal access to data and technology because "privacy." But it ultimately doesn't matter how good our privacy is. Nowhere does Apple list the privacy requirements we need to fulfill in order to play on a level playing field. We are artificially restrained from competing fairly due to artificial restraints on competition that have ***no reasonable nexus to privacy or security at all.***

Privacy and fair competition are not mutually exclusive. Apple can easily define the standards that would enable the highest level of privacy and security AND fair competition or better yet, let customers decide for themselves. Apple doesn't do that. Instead, Apple uses privacy as an

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[24] Tilley, Aaron. "Developers Call Apple Privacy Changes Anti-Competitive," The Information. (Aug. 16, 2019), https://www.theinformation.com/articles/developers-call-apple-privacy-changes-anti-competitive. ("Apple says FindMy and other apps are built into iOS and that it doesn't see a need to make location-tracking requests from users for the apps after they install the operating system.")
[25] *Id.*
[26] Andeer Letter, p. 3.

excuse to impose artificial restraints on competition to give its products an advantage and collect supra competitive fees.

This is what happens when you have a monopolist acting as a de facto regulator. The regulations will always tip the scale in favor of the monopolist.

3. We Don't Compete With Tile

Apple has also excused its conduct by saying that we don't compete because FindMy is installed by default on all iPhones rather than sold as a separate service. As explained to the House Antitrust Subcommittee, Apple advertises FindMy as part of the iPhone, and they sell iPhones. It's a different business model, but still competition all the same. And now, with the introduction of AirTags, their direct competitive stance cannot be refuted.

4. We Built The Ecosystem, Have IP Rights in Our API's And We Can Exercise Those Rights As We Please.

In another move that harkens back to the browser wars, Apple has taken the position in the Epic litigation and otherwise that they own the ecosystem so they are entitled to give its own products the preferences and privileges that it does.[27] Not so.

The reason iOS is so valuable as an ecosystem is because so many developers like Tile "make an app for that." Apple cannot on the one hand benefit from the fruits' of developer labor that enhance the value of its ecosystem and then on the other, treat them in an anticompetitive manner. *US v. Microsoft* used a colorful analogy along the lines of the fact that just because you have a baseball bat doesn't mean you can hit someone over the head with it.[28] In other words, Apple can't reap the benefit of a lucrative app ecosystem, then at the same time use their market dominance to give its own products an unfair and unreasonable competitive advantage. This is long settled.

5. Interference With Private Negotiations

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[27] "Apple Inc. Proposed Findings of Fact and Conclusions of Law." Epic Games, Inc. v. Apple, Inc. (US District Court, Northern District of California, Oakland Division. April 07, 2021). [hereinafter Apple Findings of Fact and Conclusions of Law], p. 1, 2, 17-18. https://www.scribd.com/document/502128201/Epic-Games-v-Apple-Inc-Apple-s-Proposed-Findings-of-Fact-Document#download&from_embed (The 30% commission are part of "contractual terms on the licensed use of Apple's intellectual property. Apple, as the property owner, has chosen to make its property available to others--but only on its own terms.")

[28] US v. Microsoft, U.S. Court of Appeals for the District of Columbia Circuit, 253 Fed. Rep. 3d at 63. ("Microsoft's primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: ''[I]f intellectual property rights have been lawfully acquired,'' it says, then ''their subsequent exercise cannot give rise to antitrust liability.'' Appellant's Opening Br. at 105. That is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability. As the Federal Circuit succinctly stated: ''Intellectual property rights do not confer a privilege to violate the antitrust laws.'' In re Indep. Serv. Orgs. Antitrust Litig., 203 F.3d 1322, 1325 (Fed.Cir.2000).")

Apple has also argued that legislation would interfere in the private contractual relationships between sophisticated parties. Not so. Apple's contracts are one-sided contracts of adhesion that provide developers no bargaining power. As Apple itself acknowledges, it enables developers to use its platform "only on its own terms."[29]

For context, it's helpful to take a look at Apple's developer agreement and guidelines. The developer agreement and guidelines are the rules that developers must follow to offer their apps on the App Store on your iPhone. From time to time, our engineers get a pop up message from Apple alerting them that there is a new developer agreement. When that happens, we are blocked from updating our app until we agree to them. The new terms are offered on a take it or leave it basis without meaningful notice and without an opportunity to negotiate. Similarly, Apple's Developer Guidelines can change at any time with no notice.

Those terms contain numerous concerning requirements. For instance, they currently require apps to be distributed on Apple's App Store. No competing app stores are allowed. Essentially the only reasonable way to make an app available to an iPhone user is to agree to these terms and offer the app through the App Store. Apple also gives itself the right to use developer information for any purpose, including to compete with them.[30] Apple also imposes a requirement that most digital purchases be made via its in-app payment system.[31] No competing payment systems for applicable digital purchases are allowed.[32] And for the "privilege" of using Apple's in-app payment system, we have to pay Apple as much as **30%** of our digital revenues.

6. Apple Is A Good Actor And Does Not Need Regulation

Apple may say no regulation is needed because it won't exercise its market power in nefarious ways. And its fees have not gone up since their inception. But just as Apple did an about face on Tile, it could do an about face on other competitors and even the American people. There is currently nothing stopping Apple from raising its in app purchase fees, imposing more unfair restraints on competition and employing further "hooks" to lock consumers into an ecosystem.

7. iOS Users Are Not Limited to The App Store--They Can Use The Web

Another excuse Apple has raised to the anticompetitive nature of the app stores is that developers who do not want to agree to its terms can distribute their apps via the web. Again, not so. Many apps, including Tile, could not operate via a website. Even if it was possible, iOS doesn't allow users to install application files from outside the App Store.[33] "While it's possible to use a shortcut to a website to iOS screens to make them look like apps, in the end, they're

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[29] Apple Findings of Fact and Conclusions of Law, pp. 1-2.
[30] Apple Developer License Agreement, Section 11.
[31] Apple Developer Guidelines, Section 3.1.1.
[32] *Id.*
[33] Maring, Joseph. *"Apple Says iOS Users Are Not Limited To The App Store, But Is That True?"* ScreenRant. https://screenrant.com/apple-ios-app-store-alternatives-iphone-user-dev-restrictions/.

just a shortcut to a website."[34] Regardless, because apps are distributed via the App Store, any app that needs to be sought out on the web will be at a large disadvantage. *US v. Microsoft,* makes clear that such restraints on competition are not justifiable.[35]

Regulatory Intervention is Needed

Right now, we have a unique opportunity to begin to restore innovation, competition, consumer choice and freedom to the app ecosystem. Apple has demonstrated time and again that it won't change unless someone makes them. Under the current antitrust laws, that could take years if not decades to address the multitude of abuses in the app marketplace. In another few years, it will be too late to prevent further irreparable damage to consumer choice and innovation in this country.

What do we do about it? The solution is quite simple. If Apple chooses to compete against developers reliant on its platform, it should do so fairly and according to the same rules. More precisely, app store legislation should address the anticompetitive behaviors that have been identified as needing to be addressed. For Tile in particular, and non-Apple app developers generally, that means:

- Requirements to treat all developers equally, including Apple's own apps and services;
- Prohibitions on self-preferencing, exclusionary and discriminatory behavior and lifting artificial restraint on competition, including but not limited to the payment processing and app store industries;
- Equal interoperability with the platform's permissions to ensure a smooth user experience for Apple and competing products alike;
- Prohibitions on dominant platforms from using information they glean from and about apps on their platforms to compete with them;
- Equal access to the iOS interface (i.e. enable consumers to choose which apps, if any, to install by default);
- Equal access to technology, including enabling our customers to get the benefits of UWB in the context of the Tile finding experience;

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[34] *Id.*

[35] *US v. Microsoft,* 253 Fed. Rptr. 3d at 64. ("[Microsoft] argues that, despite the restrictions in the OEM license, Netscape is not completely blocked from distributing its product. That claim is insufficient to shield Microsoft from liability for those restrictions because, although Microsoft did not bar its rivals from all means of distribution, it did bar them from the cost efficient ones.")

- Equal access to data and API's, including enabling our customers to use encrypted FindMy Network location data to power Tile's app and features.

In the meantime, Tile, it goes without saying, will not participate in Apple's FindMy Network Accessory Program. Doing so would be at odds with our commitment to our customers and partners. We pioneered the finding category, and we will continue to innovate and build world-class products that solve the universal pain point of misplaced items.

But no amount of innovation on our part can compete with Apple's misuse of its platform dominance. If Apple wants to replicate the functionality of a competitive app, it can utilize all the critical data it gathers across its platforms to extract critical information and construct the optimal competitive offering, which it then seamlessly integrates into its operating system. This is why, as stated by the House Majority Report that, "there is an innovation 'kill zone' that insulates dominant platforms from competitive pressure simply because investors do not view new entrants as worthwhile investments."[36]

I would again like to thank you Madame Chair Klobuchar and Ranking Member Lee, and other members of the subcommittee, for your time and attention to this matter. Tile decided to come forward and again tell our story, despite ongoing retaliation from Apple, because we see Apple's actions as an existential threat--to Tile and countless other app offerings like us.

We know that we are not unique among app providers. We also know that absent statutory changes to the antitrust regime, Apple will continue to exploit its market dominance to replicate the functionality of competitive apps, while simultaneously denigrating their performance on the Apple platform.

The ongoing vitality of the app ecosystem is at stake. We are hopeful that this subcommittee will take the necessary legislative action to preserve competition and protect consumer choice, and look forward to working with all of you toward that end. Thank you.

[36] House Antitrust Report, p. 18.

Testimony for U.S. Senate Judiciary Committee
Subcommittee on Competition Policy, Antitrust, and Consumer Rights
Jared Sine, Chief Legal Officer, Match Group
April 21, 2021

Madam Chair and Members of the Committee, thank you for your bold leadership in shining a light on – and advancing this important public debate – about the anticompetitive app ecosystem and specifically how Apple and Google use their monopoly power through their app stores to control the app ecosystem stifling competition and adversely impact developers, innovation, and consumers.

Match Group is a provider of online dating services with a stated mission of sparking meaningful relationships for every *single* person. In 2019, research showed that over 40% of all relationships start online — and then the pandemic hit. During that time, our platforms played a pivotal role in providing safe social connections, even when people were socially distanced. Despite the physical separation created by the pandemic, many new relationships and families formed through our apps.

At the same time, the pandemic provided Apple and Google the opportunity to double down on the stranglehold they have created over app developers and consumers alike through our smartphones. Think of the number of daily activities that not coincidentally now require apps, from banking to streaming and ebooks to online fitness classes — and the pandemic has only amplified and accelerated this need. Just ask the fitness app ClassPass, whose business went viral during the pandemic and then Apple came calling for their cut.

Apple and Google have used their monopoly-controlled smartphone platforms to redirect the meritocracy of the free, competitive, and innovative information superhighway — where the best ideas won and consumers voted with their traffic — to run primarily through the iron fist of their app store monopolies. They have systematically programmed users to seek out the "app for that" which has resulted in the fact that if you do not have an app, you might as well not exist.

Let me be clear: Apple and Google have established themselves as the only gatekeepers of the new mobile internet – using user data and app developers' innovations, ideas and even income against them to bankroll the construction of massive tollways on the formerly free information superhighway. At the heart of this strategy to control both developers and consumers is the requirement that app developers use Apple's and Google's often inferior in-app payment services — think of a credit card processor — for which Apple and Google charge a 30 percent tax.

But don't take my word for it. The late Apple CEO Steve Jobs devised this strategy. Back in 2010, Apple grew wary that it was far too simple for users to switch between iOS and Android devices because app developers were allowing users to buy services directly from them that could be readily accessed on either platform. His directive was simple: "Let's force them to use our ... payment system." He knew that once users paid through Apple — and not the app developer — they would be locked into Apple's ecosystem, tying their purchases to their iOS devices and forcing app developers to hand over the lifeblood of their businesses — their customer relationships. This was the precise moment in time when Apple came up with its mandatory IAP policy. There is no mention by Apple of safety, security, or privacy. Just a desire to fight off competition by locking in users and developers.

Apple and Google will argue that because they each have an app store, there is no monopoly power. But the reality is that the app stores operate as side-by-side monopolies. They charge the same fees and

exercise the same unilateral control. Consider the last time you or anyone you knew actually switched from an iOS device to an Android one or visa versa. You may have a hard time because it's not common — and our research on our own apps confirms it.

But beyond the empirical evidence, let me share just two of the many experiences from our business that unequivocally demonstrate the monopoly power of these app stores:

Shortly after Google launched its app store, the Google Play Store, Google persuaded us to join the Android ecosystem under the false pretenses of an open platform, where we would not be required to use Google's payment processor or pay the 30% tax. Now, years after helping establish Google's app store monopoly by bringing our apps and our consumers to its Play Store, Google is reversing field, using its entrenched monopoly power over Android to change the rules on us — tying its in-app payment system to our access to the Play Store starting in September of this year.

Not to be outdone, Apple has been equally authoritarian with its monopoly power. A few years back, Match had entered into an agreement with mobile phone provider T-Mobile to offer a discount to T-Mobile users. This discount would be provided through the iOS "T-Mobile Tuesdays" app, by providing a discount code that would link to the recently launched Tinder website. When Apple learned about this arrangement, they blocked the version of the T-Mobile Tuesdays app, asserting that the link to Tinder's website violated T-Mobile's requirement to use Apple's in-app pay system. Think of it, Apple was so hellbent on maintaining their monopoly grip on Tinder's consumers and app that they blocked T-Mobile's app, forcing T-Mobile to break its contract with us."

Apple and Google are using their monopoly power to dictate how apps operate, how much they will be forced to pay and, in many cases, if they will even survive.

Senators, this is not curation, it is iron fisted, monopoly control. When two industry players have the power to set prices, exclude competitors, and control an entire market – destroying the business and livelihoods of others with the flip of a switch – it is a monopoly. This is the same behavior of the oil barons, the telephone giants, and the railroads before them. It is no wonder that so few companies have been willing to stand up and testify against these monopolies — would you take this risk if you were a small developer?

These monopoly activities harm both app developers and consumers in many ways, all of which have a corrosive impact on innovation and our economy; however, I ask the Committee to specifically look at the following:

1. **The app store "tax"** — Today, instead of ***"there's an app"*** for that, Google and Apple's practices could better be described as ***"there's a tax for that."*** Both companies now levy a 30 percent tax on every digital transaction increasing costs on both consumers and developers alike. For Match these app store fees are our fastest growing and our single largest expense — soon eclipsing half a billion dollars annually. That's $500 million dollars that could be going back into the pockets of everyday consumers or deployed to hire employees or invest in new innovations.

2. Apple's and Google's in app payment rules force users to hand over massive treasure troves of their most sensitive user data to Apple and Google, which these Tech Giants can use to enrich their own products, or develop their own competing digital services (nearly overnight) and charge 30 percent less than everyone else.

We have seen them do this again and again, from ebooks to streaming services and child safety apps to most recently fitness services. Apple and Google will tout the fact that 85% of the apps in the app store only pay the annual $99 developer fee, and in fact, Apple and Google allow these other apps to use their own payments services. **If mandatory in-app payment was truly about security, it would stand to reason that every business would need to use it.**

3. **Safety is actually harmed in the current system.** Neither Apple nor Google have been willing to help us with even the most basic safety features. And because of Apple's and Google's stranglehold on consumers and their data, it's difficult for us to conduct even some of the most basic safety checks. For example, despite our multiple requests over the years, Apple and Google still allow underage users to download our apps, even when they know the individuals are under 18. Apple and Google actually make it harder for us to keep our users safe.

Perhaps most harmful and corrosive is the fact that these monopolistic practices are:

4. **Incentivizing the monetization of selling user data and reducing innovation** – Apple and Google essentially push developers to adopt a less privacy-friendly business model. Additionally, by removing competition in the payment space innovation is harmed. The app store in app payment structure incentivizes companies to operate more like social media where consumer data is the commodity and monetized. Match stands with members of this Committee who have been critical of this business practice.

When the veneer of their safety, security and privacy arguments shatters under the weight of scrutiny, Apple and Google respond that they built the platforms and should be able to decide what business models they use. Members of the Subcommittee, I submit that the railroad companies built the railroads. The steel companies built the steel mills. The power companies built the power lines. The telephone companies built the telephone lines. The creators of all of these incredible inventions each made the same argument at different times, but it did not justify monopoly rents then and neither should it today. Just because Apple and Google own platforms, does not give them the right as a matter of law to mandate exclusivity and restrict competition. Thank you, and I look forward to answering your questions.

Consumer Federation of America

Testimony of Dr. Mark Cooper,
Director of Research
on
Antitrust Applied: Examining Competition in App Stores
Senate Committee on the Judiciary,
Subcommittee on Competition Policy, Antitrust, and Consumer Rights

April 21, 2021

INTRODUCTION

My name is Dr. Mark Cooper, I am the Director of Research at the Consumer Federation of America (CFA). We greatly appreciate the opportunity to testify today on what is undoubtedly the most important legislative issue affecting antitrust in the almost forty years that I have been analyzing antitrust issued at CFA. In those four decades we have written hundreds of comments, analyses and papers on various aspects of the harm suffered by consumers when antitrust authorities fail to do their job to ensure that competition protect them.

In my comments today, however, I will draw on three articles and I submit these for the record. They outline the problem and the response from Congress that is urgently necessary: The Hastings Law Review (2001) *Antitrust as Consumer Protection in the New Economy: Lessons from the Microsoft Case;*[1] The Harvard Law and Policy Review (2015), *Antitrust and Regulation: Complementary Tools in the Digital Age,*[2] and *Big Data Platforms, A New*

[1] Mark Cooper, April 52(4).
[2] Gene Kimmelman and Mark Cooper, September, 9(2).

Chokepoint in the Digital Communications Sector, Meeting New Challenges with Successful Progressive Principles [3]

THE PROBLEM OF ANTICOMPETITIVE, ANTI-CONSUMER STRUCTURE AND CONDUCT

The digital communications space, dominated by a handful of platforms using and abusing market power to undermine competition for applications is the most pressing example of lax antitrust enforcement that threatens not only consumers but innovation in the digital economy. As we concluded six years ago,

> [O]ne primary goal of public policy in a dynamic digital economy is to ensure that the market power that is inherent in the platforms does not hinder or diminish the competition for goods, services and applications that can flow on the platform. We have the model in hand, bright lines behind which entrepreneurial experimentation is unleashed, and strong antitrust principles to constrain market power.[4]

The great challenge is how to draw the line, to find a set of policies that preserve the incentive and ability to innovate on both sides of the line. Here a little history serves us well.

I recognize that these are all innovative companies that seek and earn innovative rents, when they can. These rents can be called Schumpeterian because they disrupt business as usual and the invention of new goods and services that meet and redefine consumer needs and wants. However, there comes a point when dominant players cease chasing Schumpterian rents and start chasing what I call "Rockefeller" rents. These are rents that accrue to firms not because they innovate, but because they build bigger moats around their businesses, which lock consumers in and competitors out. There are two clear indications that the behavior of dominant firms has

[3] Mark Cooper and Amina Abdu, 2020, Consumer Federation of America, September.
[4] Kimmelman and Cooper, 2015, p. 440.

shifted, they shift from innovating things to buying up the innovators around them, and they shift from relying on open access to closing the platform down.[5]

History is a good teacher, but there are also lessons to be learned from the study of digital platforms. The complexity of the challenge to writing antitrust rules is described by an extensive study prepared by the Stigler Center,[6] in a study of antitrust, which is summarized in Table 1.

Digital platforms pose a unique challenge for competition and antitrust for a variety of reasons. Table 1 is constructed to highlight the tension in the analysis of the Stigler antitrust group, which mirrors the tension in the digital political economy. We also show references to Tim Wu's recent discussion of antitrust. Here we have a litany of supply-side structural characteristics that explain concentration and market power, and an equally long litany of demand-side characteristics that explain the immense ability of the seller to exploit their market power. The irony is that many of the characteristics of digital markets that pose challenges to competition and antitrust are also the source of the efficiency of the new form of industrial organization.

First, as shown in the upper left, the new form of organization that generates a great deal of surplus also tends toward high levels of concentration and barriers to entry.[7]

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[5] Cooper, 2001, p. 875, One of the most important observations about the origins of appositive feedback process is its openness in the early stages of development. In order to stimulate the complementary assets and supporting services, and to attract the necessary critical mass of customers, the technology must be opened to adoption by both consumers and suppliers. The openness captures the critical fact that demand and s=consumers are interrelated. If the activities of firms begin to promote closed technologies, this is a clear sign that motivations may have shifted. While it is clear in the literature that the installed base is important, it is not clear that the installed based must be so large that a single firm can dominate the market. Open platforms and compatible products are identified as presenting a basis for network effects that is at least as dynamic as closed proprietary platforms and much less prone to anticompetitive conduct.

[6] *Market Structure and Antitrust Subcommittee Report," George Stigler Center for the Study of the Economic and the State,* The University of Chicago Booth School of Business, April 2020, (hereafter, Stigler)

[7] Id/. P. 27. These markets often have extremely strong economies of scale and scope due to low marginal costs and the returns to data. Moreover, they often are two-sided, have strong network externalities and are therefore prone to tipping. If so, the competitive process shifts from competition *in* the market to competition *for* the market. This combination of features means many digital markets feature large barriers to entry. The winner in these settings often has a large cost advantage from its scale of operations and a large benefit advantage from the scale of its data. An entrant cannot generally overcome these without either a similar installed base (network effects) or a similar scale (scale economies), both of which are difficult to obtain quickly and cost-effectively

TABLE 1:
CHALLENGES OF NEW TECHNOLOGY

STIGLER GROUP ON ANTITRUST AND REGULATION		TIM WU (*CURSE OF BIGNESS*, Pg. #)	
Market Characteristics that increase surplus but weaken competition			
(1) Average cost is too low (2) Quality costs are too high (3) Transaction costs are too low (4) Advertising costs are too low (5) Advertising value (targeting) with large databases is too effective (for some/many) (6) Consumer preference v. consumer welfare (7) Increased output v. allocation of output (8) Direct network effect value for communications consumers is too (9) Indirect network effect value to producers of complements are too large (10) Local/global expansion costs are too low		**Antitrust Reform**	**Economic Issues**
		128	15, 119,
		129	120,123
		134	124, 125
Traditional conduct that reinforces market power			
On the supply-side (11) Limit openness and interoperability (12) Lack of transparency (13) Exclusion or degradation of services (14) Resist data portability (15) Consumer exploited by behavioral economics (16) Complex, opaque transactions On the demand-side (17) Pricing (loyalty and to zero) (18) Contracts (19) bundling (20) Lack of transparency (21) Increasing switching costs (22) Magnifying switching cost through sunk costs and asymmetric information		Antitrust Reform	Economic Issues
			119
Consumer behaviors that contributes to entry barriers abuse by dominant firms			
(23) Inherent behavioral biases (24) Data is open to manipulation & exploitation (25) Manipulation of Consumer preference v. welfare (26) Machine learning is uniquely powerful (27) Lack of availability of Information (28) Failure to research and compare		**Antitrust Reform**	**Economic Issues**
		128, 135	112,120
		137	123,125
Policy that facilitates or fails to address market power			
Lax antitrust enforcement (29) Structure (mergers) (30) Conduct (fraud and abuse) Lack of regulatory authority (31) Ineffective (privacy) (32) Absent (big data exploitation) (23) Severe challenge of assessing consumer welfare (34) Political impact of weak antitrust & absence of regulation		**Antitrust Reform**	**Economic Issues**
		16,17,18, 32, 40,41, 42, 72 123, 125 128, 130,	123, 132 133, 139

Source: Stigler Committee on Digital Platforms, *Market Structure and Antitrust Subcommittee Report*," *George Stigler Center for the Study of the Economic and the State*, The University of Chicago Booth School of Business, April 2020, Tim Wu, *The Curse of Bigness*, Columbia Global Reports, 2019.

Second, behavioral imperfections are highlighted. They have been recognized for several decades, making these markets very vulnerable to the accumulation and abuse of market power by dominant firms.

> Additional barriers to entry are, ironically, generated by the very consumers who are harmed by them… In general, the findings from the behavioral economics literature demonstrate an under-recognized market power held by incumbent digital platforms.
>
> The role of data in digital sectors is critical. Personal data of all types allows for targeted advertising to consumers, a common revenue model for platforms. The report shows that the returns to more dimensions and types of data may be increasing, which again advantages incumbents. Consumer data in the United States is not regulated in any way that gives useful control or privacy to consumers, and additionally, most consumers have little idea what is being collected about them and re-sold. One way in which digital platforms often exploit their market power – and increase their profits – is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing, but which give the platform freedom to monetize consumers' personal data.[8]

The behavioral economics present a different, and in some ways greater, challenge to traditional antitrust.

> Behavioral economics magnifies the anticompetitive potential and harm of platforms. Consumer biases are vulnerable to big data and competition is not the solution, since the marketplace – demands exploitation for competitive survival because "staying profitable in a competitive environment may force firms to exploit behavioral biases to achieve maximal profitability. Firms abstaining from doing so may be driven out of the market... rais[ing] broader consumer protection concerns that cannot be solved through greater competition.[9]

Thus, the Stigler antitrust group identifies a number of practices that can lock in consumers, raising barriers to entry and reducing competition.

> One way in which digital platforms often exploit their market power – and increase their profit – is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing, but which give the platform freedom to monetize consumers' personal data.
>
> Maintain complete control over the user relationship… can be used to reduce the possibility of successful entry by direct competitor. Exclusive contracts,

[8] Stigler, p. 28.
[9] Id., pp. 52-53.

bundling, technical incompatibilities.[10]

We have long passed that critical point when it comes to platforms and applications, where anticompetitive mergers have been followed by exclusionary practices that raise consumer switching costs and increase barriers to entry. The list of abusive practices from the Microsoft may have seemed unique because it is so long, but it will be familiar to anyone looking at the Apps store issue.[11] Each and every one of these practices is an abuse that can undermine competition and should be prevented.[12]

SUPPLY-SIDE DEFENSES AGAINST THE ABUSE OF MARKET POWER

The long history of communications platforms and the recent history of digital platforms teaches important lessons, as described in Table 2.

Nondiscriminatory interconnection, access to potential consumers, is a necessary condition for competition on the platform, but it is not sufficient.

Nondiscriminatory carriage is another necessary, but insufficient condition.

Combined in the digital age, nondiscriminatory interconnection and carriage equal **open applications interfaces.** Competitors must be shown and allowed to use the application interfaces that enable them to compete for the services they want to deliver to the public on the platform.

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[10] Id., p. 29..

[11] Cooper, 2001, p. 816., "Microsoft attacked the fundamentals of antitrust… to present a theory that asked the court to abandon its traditional view of competition and accept the proposition that markets will inevitably be dominated by very few large companies… traditional antitrust rules will achieve exactly the reverse… promote innovation by allowing potential competitors, who would otherwise be quickly eliminated by the giant's anti-competitive behaviors, to have a fair chance to enter the market and eventually discipline the price and quality of ,,, products

[12] Cooper, p. 802, 804: "Practices make it difficult for competitors to design products that operate well as the operating system (platform) is manipulated and changed… Erect barriers to entry.. freeze out competitors with in compatibilities, build in features that impede or disable competing products, withdraw support for competitor programs, lock in consumers with constant imitation … Prevent competitors from getting access to users… foreclose distribution channels… require use of (proprietary) software, while disabling competitors,… conditions to prevent competitors from garnering resources.

TABLE 2:
AREAS TO BE ADDRESSED BY POLICY

Interconnection

(1) Comparably Efficient Interconnection: the principle of providing competitors with access to the broadband network on terms that are technically and economically equivalent to those provided by the broadcast carrier to itself.
(2) A prohibition on preferred agency or exclusive arrangements between vertically-integrated broadband access providers and integrated or affiliated information service providers which contain discriminatory access provision, either in terms of price or quality of access.
(3) Access: the ability to make a physical connection to cable company facilities, at any place where a cable company exchanges consumer data with any Internet service provider, or at any other technically feasible point selected by the requesting Internet service provider, so as to enable consumers to exchange data over such facilities with their chosen Internet service provider .

Pricing

- safeguards in order to prevent instances of anti-competitive behavior… implementation of a cost-based price floor to protect against below-cost pricing of broadband access services;
- implementation of a cost-based price ceiling with a limited mark-up to prevent excessive pricing of access services in uncontested markets;
- implementation of a third-party access tariff, allowing for non-discriminatory and unbundled access to broadband bottleneck facilities, as well as comparably efficient interconnection and associated non-price safeguards;
- implementation of price caps, accounting separations and other safeguards against anti-competitive cross-subsidization;
- imputation of appropriate third-party access tariffs to value added information services providers by broadcast carriers.

Non-price safeguards

- competitors able to gain comparable access to network bottlenecks;
- competitors protected against abuse of confidential information which is provided to the bottleneck access provider;
- competitors not otherwise disadvantaged in the market by the bottleneck access provider through, for example, the negotiation of exclusive or preferential agreements with other service providers.

Bundling

- the bundled service must cover its cost, where the cost for the bundled service includes
- the bottleneck component(s) "costed" at the tariffed rate(s) (including, as applicable, start-up cost recovery and contribution charges);
- competitors are able to offer their own bundled service through the use of stand-alone tariffed bottleneck components in combination with their own competitive elements;
- resale of the bundled service permitted…

Sources: This list of conditions was contained in our recent analysis Mark Cooper and Amina Abdu, 2020, Big Data Platforms, A New Chokepoint in the Digital Communications Sector, Meeting New Challenges with Successful Progressive Principles, Consumer Federation of America, September. It was originally developed in a 2020 paper entitled. Cooper, Mark, 2000b, *Who Do You Trust? AOL And AT&T … When They Challenge the Cable Monopoly or AOL and AT&T. When They Become the Cable Monopoly?* (Consumer Federation of America, Consumers Union and Media Access Project, February 2000), based on AT&T Canada Long Distance Services, "Comments of AT&T Canada Long Distance Services Company," before the Canadian Radio-television and Telecommunications Commission, Telecom Public Notice CRTC 96-36: Regulation of Certain Telecommunications Service Offered by Broadcast Carriers, February 4, 1997. At the federal level, AOL's most explicit analysis of the need for open access can be found in "Comments of America Online, Inc.," In the Matter of Transfer of Control of FCC Licenses of MediaOne Group, Inc. to AT&T Corporation, Federal Communications Commission, CS Docket No. 99-251, August 23, 1999 (hereafter, AOL, FCC). America Online Inc., "Open Access Comments of America Online, Inc.," before the Department of Telecommunications and Information Services, San Francisco, October 27, 1999.

Proprietary applications interfaces are highly suspect, when they have the effect of excluding or gaining unfair advantage over competitors. They should be presumed to be anticompetitive, unless, as described below, the platform operator, who must bear the burden of proof, can show they are both not anticompetitive and enhance the consumer experience.

These are all necessary conditions, but even taken together they are not sufficient. Policy must also deal with anticompetitive business practices. These can take many forms, but the policy solution is to insist on **fair, reasonable, and nondiscriminatory rates terms and conditions (FRAND)** offered by dominant incumbents to all potential competitors..

As described in Table 1, the obligation to treat potential competitors in a FRAND manner also applies to a broad range of business practices.

- Pricing
- Non-pricing safeguards and
- Bundling

To the extent that the platforms seek to preserve practices that a competitor finds abusive, the presumption should be shifted against the practice in question.

- They should be considered abusive and eliminated until, and unless, the platforms can show that they are not anticompetitive and uniquely beneficial to consumers. The platform owner should be at grave risk when seeking to make this showing.
    - Should they fail, they should be liable for damages and
    - banned from selling the service for a period long enough to undo the harm to competition.

DEMAND-SIDE RESPONSES

While the above measures are crucial to ensure the supply-side opportunity for competitors to enter the market and constrain the market power of the dominant firms, their ability to do so will be limited if they cannot attract customers. The demand side matters more than ever, in large part because the dominant firms have raised switching costs and locked down

consumers. The dominant players take a huge advantage and bias the outcome. They set defaults to favor their products. They advertise and push the consumer advantage of just going along with their choices. They require multiple clicks to make a contrary choice. Some of those clicks are difficult to find or follow.

The ultimate objective is to collect data, which plays a crucial role in causing these markets to tip and allowing the dominant players to continue to reinforce their dominant positions once they have tipped. The dominant platforms collect massive amounts of data and use it as they see fit. The exploitation of consumer data to build and reinforce monopoly power is a key distinguishing feature of these platforms. Any set of remedies that Congress pursues must include powers that allow regulators to understand how the platforms are using consumer data and impose behavioral remedies that erase the platforms' data advantages.

What is the equivalent on the demand-side of an open access regime based on fair, reasonable and nondiscrimination that allows potential competitors the opportunity to sell their output to the public? It is the ability for consumers to freely choose the products that they want. Economists call it consumer sovereignty "Consumer sovereignty is an economic concept where the consumer has some controlling power over goods that are produced, and the idea that the consumer is the best judge of their own welfare."[13] Consumer sovereignty is just as essential to a competitive regime as producer ability to offer goods to the public, see Figure 1.

We need

Opt-in, not opt out, to give consumers effective control of choice

Equal single click for all choices to take the bias out of the process

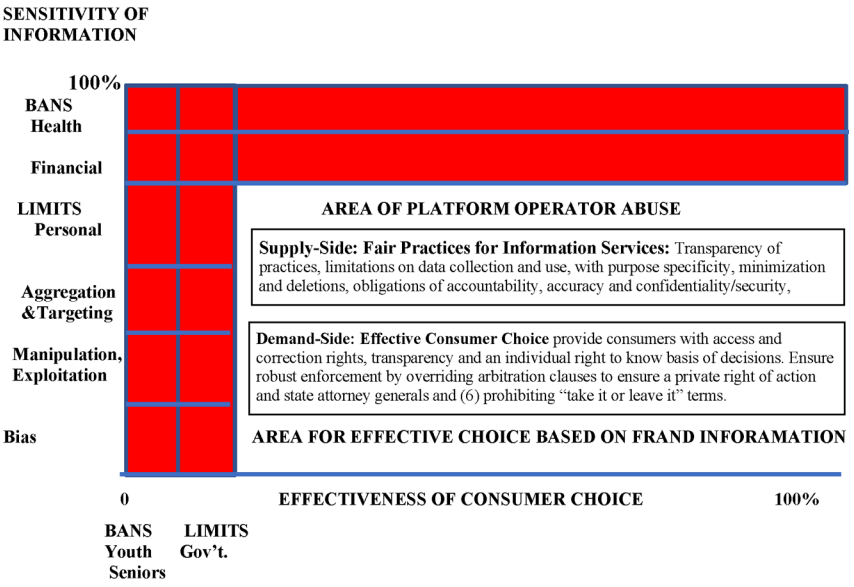
Provision of neutral information, to avoid influencing consumer unfairly

[13] Wikipedia.

Clear description of information use, with choices about the nature and level of data collection and use, so that consumers know what they are getting into.

Some limitations of information collection, where the underlying information is too sensitive to allow to circulate

FIGURE 1:
CONSUMER/PRIVACY ADVOCATE ISSUES FOR A DATA PROTECTION AGENCY



Some limitations on target groups, for those who are deemed too vulnerable or unable to exercise sound judgement.

While this is a long list of steps needed to fix the anticompetitive problem in the actions of Big Data Platforms, it is intended to preserve the roles of competition and consumer sovereignty in the digital marketplace, as shown in Figure 1. The groups and types of

information that are ruled out of bounds are relatively small compared to the vast majority of consumers and decisions that can be made. The challenge is in designing rules to govern conduct in the area of choice.

The graph identifies real transparency on the supply-side – with the shorthand of Fair Practices for Information Services (FPIS)[14] – are not enough. The demand side requires mechanisms for effective consumer action. Both FPIS and effective choice mechanism must be ongoing, with consumers empowered to decide before information is gathered and to easily change their choice as they see fit.

CONCLUSION

The Stigler group recommendations for antitrust reform concludes that "It is time for antitrust law to recalibrate the balance it strikes between the risks of false positives and false negatives." "Recalibration" may sound like a timid response, but there are a number of ways in which it is profound. In addition to the major changes identified above, the Stigler antitrust group will also let a new regulatory agency handle many issues that would frustrate antitrust. This is the pattern we have pointed out in the New Deal as the launchpad for the Golden Age of Capitalism. Antitrust law was not substantially amended, but enforcement was ramped up dramatically while over a dozen other policies were adopted and new regulatory agencies created.[15]

At the same time, the Stigler group's recommendations reflect a belief in the overall success of the Sherman Act approach and its flexibility to deal with economic changes. They tie this to the link to common law. The Stigler antitrust group notes that the preference for

[14] This is obviously a play on words with respect (FIPS), intended to highlight how much more is needed.
[15] Mark Cooper and Amina Abdu, 2020, *From Brandeis to Stiglitz: Into & Beyond The 2020 Election, The Brandeis Protocol and the Stiglitz Model Create a Framework for Pragmatic, Progressive Capitalism*, September.

legislation over practical evolution is a close call. The significance of the proposed recalibration can be appreciated from another perspective. As the Stigler antitrust group points out,

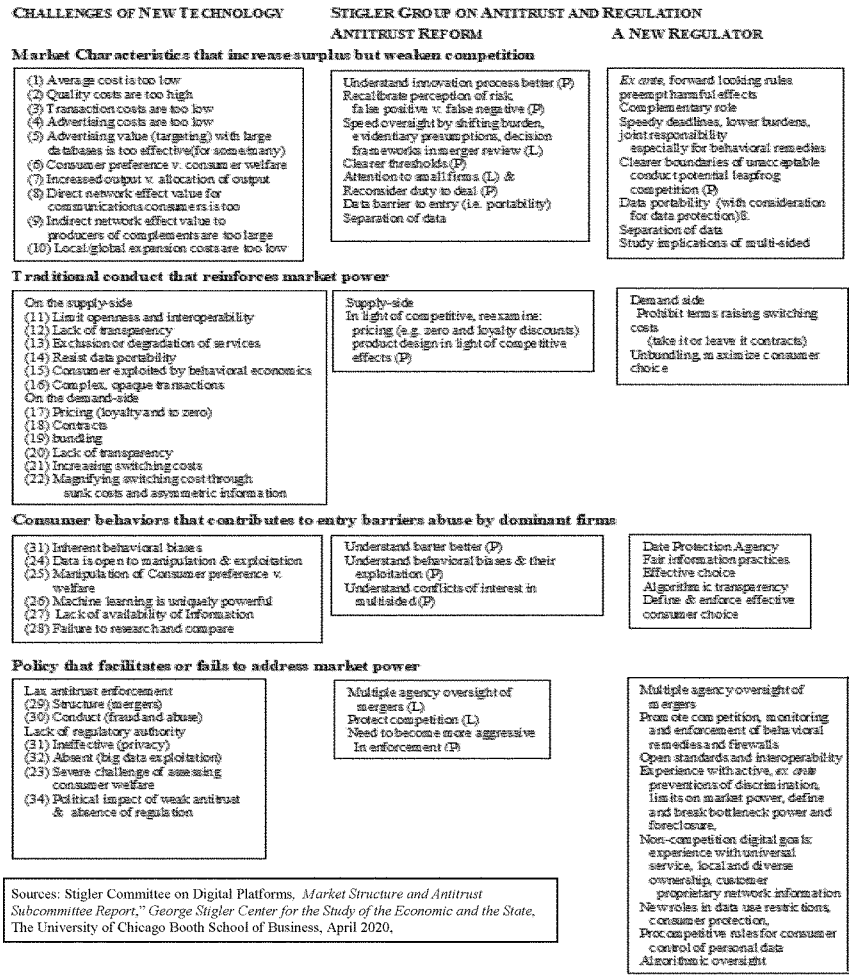
> With few exceptions, antitrust law has in the past evolved in a common-law-like process by which it has reflected new learning and judicial and market experience. This process is continuing, at least to some extent, as antitrust law and enforcement have recognized, for example, previously unnoticed competition problems in labor markets and doctrine has evolved to incorporate new learning about competitive problems that can be created by most favored nation (MFN) and other vertical agreements. The challenges posed by the big technology platforms and the current populist political climate have, however, put the issue of antitrust reform before Congress in various legislative proposals. There are advantages and disadvantages to both common law evolution and new legislation. Evolution by a common law-like process takes time.[16]

I realize that these recommendations leave many details to be worked out with respect to specific services and applications. But, that is exactly the point. If we want to preserve the dynamic innovation driven by competition on both side of the line between the underlying communications platforms and the complements that ride on those platforms, we need detailed analysis by the antitrust experts. Indeed, we may find that antitrust is not enough to police abuse on a daily basis and regulation is necessary, as it has been for pre-digital communications networks.

In fact, as shown in Table 3, the Stigler groups recognized that a great deal of what was needed to correct the problems in the digital communications platforms had to involve regulation for at least two reasons. First, antitrust tends to be slow and the harm to competition in this sector tends to be fast. Second, antitrust authorities are not well-equipped to implement day-to-day oversight of behavioral remedies and the regulatory functions that have been cobbled together within antitrust institutions are grossly inadequate.

[16] Stigler, p. 89.

TABLE 3:
OVERSIGHT OF BIG DATA DIGITAL PLATFORM,
ANTITRUST REFORM AND A NEW REGULATORY AGENCY



Sources: Stigler Committee on Digital Platforms, *Market Structure and Antitrust Subcommittee Report*," *George Stigler Center for the Study of the Economic and the State*, The University of Chicago Booth School of Business, April 2020,

Here I offer the advice that my dissertation advisor gave me almost fifty years ago. Smart people need to know the right questions, they do not have to know all the right answers. Congress should do what it is good at, which is setting the direction for policy and providing the necessary resources, and avoid what it is not likely to be good at, picking winners and losers. If Congress get the goals, authority and power (including resources right) for the expert agencies, there is a good chance the agencies will get it right. If Congress draws lines in the sand, there is a good chance they will soon be wrong, especially in a dynamic industry that develops quickly.

Congress must act to clear away the thicket of mergers and abuse practices that has grown in four decades of lax enforcement. But Congress should not try to pick winners and losers. It should put all of the suspect practices and mergers on the table, clearing away the decades of antitrust malpractice and empowering and demanding antitrust authorities to revisit the structure and conduct of the digital communications space.

The re-examination should be a rapid process, allowed to take no longer than a years and congress will have to ensure that those agencies have the necessary resources to conduct this rapid review.

Once the dominant platforms are put on notice, they may realize that they are no longer able to get away with the abuses and quickly alter their behaviors.

Antitrust reform is an obvious first step, but ultimately, Congress must recognize that antitrust alone is not likely to be enough. Regulation of day-to-day practices to limit abuse and rapid response to abuses are also necessary to preserve competition and consumer protection in digital communications.

The Consumer Federation of America has offered a lengthy, historical analysis that places the need for reform of antitrust and development of regulation in the broad context of the

successful political economy of the middle of the 20th century offering arguing that we need to update what worked so well and offering a lengthy discussion of the role of antitrust and regulation, published simultaneously with the analysis of Big Data Platforms discussed above. We described the analysis as follows:

> The report dives into the complexity of the current situation and concludes that the policy principles needed today to prevent big data platforms and big broadband networks from strangling and distorting the development of the digital communications sector are the same principles applied to ensure the success of the 2nd Industrial Revolution in America a century ago. The Brandeis-Stiglitz model of pragmatic, progressive capitalism meets the challenge.
>
> - It seeks to construct guardrails and guidance to promote competition and innovation in decentralized markets and orient capitalism in a direction that promotes and furthers the fundamental economic, social and political values of society, while ensuring consumer benefits and providing consumer protection.
>   - The process must be pragmatic and flexible to accommodate the dynamic economy, based on analysis of the real-world functioning and impact of each sector, implemented by experts who have not only the skill, but the authority and resources to implement policy to pursue the goals.
>   - Political developments should be democratic and participatory, endeavoring to have political development support the evolving economic structure.
>
> The details must be worked out through antitrust and regulatory practice, but clear statements of goal, reform of processes and identification of the factors to be considered will speed and direct the development of oversight to protect consumers, while preserving the dynamic, digital economy.
>
>   - Common law is the basis for Antitrust; it should be the basis for regulation.
>   - Clear obligations should be imposed, e.g., a duty to deal (nondiscrimination)
>   - Statutory and precedential obstacles to vigorous enforcement by antitrust and regulatory agencies should be removed.
>   - Statutory mandates should be avoided, but oversight authorities should be allowed to impose "strict" prohibitions where evidence justifies such actions.
>   - As a starting point, utility-like regulation is too restrictive on entrepreneurial activity, while horse and buggy competition misunderstands the nature of the technology and minimum efficient scale .
>   - The discussion of regulation also suggests a "new" form of participatory governance, to enhance the involvement of citizens in rulemaking, which is a clear update of Brandeis' support for industrial democracy.[17]

[17] Cooper and Abdu, 2020.

Testimony of Horacio Gutierrez

Head of Global Affairs & Chief Legal Officer, Spotify

U.S. Senate Judiciary Committee

Subcommittee on Competition Policy, Antitrust, and Consumer Rights

April 21, 2021

Introduction

Good afternoon Chairwoman Klobuchar, Ranking Member Lee, and Members of the Subcommittee on Competition Policy, Antitrust, and Consumer Rights. My name is Horacio Gutierrez, and I am the Head of Global Affairs and Chief Legal Officer of Spotify. Thank you for the opportunity to testify before the Subcommittee today.

Before I begin, I want to extend my condolences to the Capitol Hill community and the families of Officer Evans, Officer Sicknick, and Officer Liebengood following the tragedies that occurred in recent months. On behalf of Spotify, please accept our deepest sympathies and our profound gratitude to these brave public servants, and many others, for defending our democracy.

We applaud the Subcommittee for its focus on competition concerns in the technology sector and in particular for holding this hearing on the critical issue of unfair and anticompetitive app store practices.

The growth of our economy depends on continued innovation and expansion of consumer choice—and government action to prevent app platforms' unprecedented abuse of market power is as necessary today as it was at other pivotal moments in America's economic history:

- Congress in 1890 passed the Sherman Act in response to concerns about the ability of trusts to gain control of key segments of the economy, and that law was successfully invoked to eliminate the anticompetitive practices of Standard Oil that gave it iron-fisted control over the American oil industry.

- The government in the 1970s brought an antitrust action against AT&T culminating in a settlement that opened the telecommunications system to competition just as advances in technology were enabling dramatic innovations that increased consumer options and lowered costs.

- And the Microsoft case in the 1990s similarly addressed restraints that would have limited the technological progress promised by the internet.

The explosion in the app economy opens the door to innovation that will confer huge benefits on consumers and our entire society. But those benefits will not be realized if platforms are allowed to continue to abuse their unprecedented power to interfere with the relationships between third-party app developers and their customers—which is inflicting serious harm on both consumers and competitors. Our economy is changing at internet speed, and legislative action is urgently needed to give antitrust enforcement agencies the

tools they need to prevent platforms from consolidating their domination over this critical, vibrant marketplace.

My testimony today focuses on three key points.

First, the use of mobile apps is exploding and apps increasingly are consumers' preferred method for purchasing an ever-widening variety of goods and services.

Second, Apple—which controls the leading mobile app platform—is abusing its complete power over the apps available to owners of Apple devices to hurt consumers. Apple's actions are preventing competition on the merits and imposing rules that unfairly advantage Apple's own services and disadvantage competitors. If Apple is permitted to continue to unfairly insert itself as a gatekeeper between third-party app developers and their customers, and reap the resulting unjustified profits, other platforms inevitably will follow its lead.

Third, we appreciate and welcome the broad antitrust reform proposed by Chairwoman Klobuchar along with Senators Blumenthal and Booker because it will make Section 2 cases less daunting for the government to bring. Senator Hawley recently proposed a bill with a number of similar and very important reforms. Such legislation would be a welcome and important part of what needs to be done, but it alone is not enough. The threats and harms posed by Apple's practices are immediate and ongoing and we urge the Subcommittee to consider additional legislation focused specifically on prohibiting platforms' abusive practices.

The Exploding App Economy

Apps today are an essential means by which consumers can, and do, conduct all of the activities of daily life. Stopping platforms from abusing their control over app stores to improperly and unjustifiably restrict competition—and thereby limit consumer choice—is therefore critical to ensure the proper functioning of our economy.

The Supreme Court recently explained that "'apps' enable iPhone owners to send messages, take photos, watch videos, buy clothes, order food, arrange transportation, purchase concert tickets, donate to charities, and the list goes on. 'There's an app for that' has become part of the 21st-century American lexicon."[1]

[1] *Apple, Inc. v. Pepper*, 139 S. Ct. 1514, 1518 (2019).

Consumers worldwide spent more than $120 billion through apps in 2020—which is more than double the amount spent in 2016.[2] In the United States alone, they downloaded 13.4 billion apps, and spent 136.4 billion hours on their smartphones.[3]

The pandemic has only increased consumers' use of and reliance on apps. As Apple itself explains, "[a]pps have become even more critical to Americans' everyday lives as they seek out new and safe ways to learn, work, and stay engaged with friends and family during the pandemic. The App Store provides support for remote ordering from restaurants, vibrant and impactful remote learning for students, telehealth for patients and doctors, and digital commerce for small businesses."[4]

Apple's App Store Control—And Apple's Abuses Of That Power That Are Producing Serious Consumer Harm

The source of Apple's unprecedented market power is the company's total control over access to its App Store, which is the only way that app developers can reach Americans who own more than 202 million Apple iPhones—as well as the users of the 1.65 billion Apple devices worldwide.[5]

Ironically, it was app developers—the very group now subject to Apple's ever-increasing abusive restrictions—that enabled Apple to acquire this power in the first place.

When Apple first introduced the smartphone in 2007, it did not permit third parties to develop apps. But the very limited functionality provided by Apple-developed apps failed to attract consumers.

Apple quickly announced that it would release information enabling third parties to develop apps, and the App Store opened in July 2008 with 500 third-party apps. There were ten million downloads on the App Store's first weekend of operation and Steve Jobs lauded the contribution of third-party developers, stating that they had created "extraordinary

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[2] ACT| The App Association, *State of the App Economy* 4 (2021), https://actonline.org/wp-content/uploads/2020-App-economy-Report.pdf.

[3] App Annie, *State of Mobile 2021*, https://www.appannie.com/en/go/state-of-mobile-2021/.

[4] Apple, *iOS app economy creates 300,000 new US jobs as developers adapt during pandemic* (Sept. 2020), https://www.apple.com/newsroom/2020/09/ios-app-economy-creates-300000-new-us-jobs-as-developers-adapt-during-pandemic/.

[5] Statista, *Installed base of the Apple iPhone in the United States from March 2016 to September 2019* (Jan. 22, 2021), https://www.statista.com/statistics/948712/united-states-apple-iphone-installed-base/; Stephen Nellis, *Apple sees revenue growth accelerating after setting record for iPhone sales, China strength*, Reuters (Jan. 27, 2021), https://www.reuters.com/article/us-apple-results/apple-tops-wall-street-expectations-on-record-iphone-revenue-china-sales-surge-idUSKBN29W2TD?il=0.

applications."[6] Apple then launched its "[t]here's an app for that" advertising campaign, pointing to innovative third-party apps as the reason consumers should purchase Apple devices; the number of third party apps increased rapidly; and sales of Apple devices grew dramatically.[7]

Today more than four million third-party apps are available through the App Store.[8] And the huge variety of goods and services that these apps make available to consumers is the critical reason for the popularity of Apple products.

From the beginning, Apple used its control over access to the App Store to exercise unilateral, unreviewable authority to set the rules governing apps available to Apple device owners. Initially those rules were not constraining—because Apple wanted to attract developers who would provide the expanded functionality needed to convince customers to purchase Apple devices.

But as the number of Apple device users skyrocketed, Apple became increasingly aggressive in adopting restrictive App Store rules. Those restrictions have not been imposed uniformly; to the contrary, they have been targeted on companies that are, or might become, Apple's competitors in downstream markets for providing goods and services to consumers. The result: consumers' choices for these goods and services are artificially limited by the increased costs and restrictions that Apple imposes on those competitors.

Apple's treatment of Spotify provides a case study of Apple's abusive practices. But Spotify's experience is not at all unique: numerous other app developers—that offer on-line gaming, video streaming, access to ebooks, and myriad other applications—have suffered the same treatment.[9] Indeed, I have spoken with dozens of developers who have looked on with frustration as Apple has engaged in exclusionary and predatory conduct without any accountability. Many of them are afraid to speak publicly, fearing retribution from Apple that could end their businesses.

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[6] *See* Philip Elmer-Dewitt, Steve Jobs: Apple Will Open iPhone to 3rd Party Apps in February, http://fortune.com/2007/10/17/steve-jobs-apple-will-open-iphone-to-3rd-party-apps-in-february/

[7] *See* Apple Press Release, iPhone App Store Downloads Top 10 Million in First Weekend, https://www.apple.com/newsroom/2008/07/14iPhone-App-Store-Downloads-Top-10-Million-in-First-Weekend/.

[8] Statista, *Number of available apps in the Apple App Store from 2008 to 2020* (Feb. 4, 2021), https://www.statista.com/statistics/268251/number-of-apps-in-the-itunes-app-store-since-2008/.

[9] A number of these businesses have banded together to create the Coalition for App Fairness, which advocates common sense principles to establish and maintain fairness for developers, consumers and the owners of the app stores. *See* https://appfairness.org/.

Providing the Subcommittee with a detailed description of Apple's treatment of Spotify will, I hope, serve as an example of the many unjustified, unfair actions targeting app developers.

Spotify provides streaming audio services, primarily music and podcasts, to millions of Americans. Our mission is to unlock the potential of human creativity by giving a million creative artists the opportunity to live off their art and billions of fans the opportunity to enjoy and be inspired by these creators. Over 345 million customers world-wide use Spotify to listen to music and podcasts.

In February, Spotify CEO Daniel Ek described his motivations for founding the company as follows: "For Spotify, audio is our history—and it's our future. In 2006, the music industry was collapsing. Piracy was killing it. The idea that all music should be free for the taking, no matter the cost and effort, destroyed the careers of a lot of working artists. We believed there had to be a better way. And we knew our platform had to be nothing short of revolutionary if we were going to stand a chance of getting people to abandon piracy and pay for music again. Today if you're an artist or a podcaster with a song to share, an album to drop, or a story to tell, we want Spotify to be your best place to find an audience. It's connecting listeners with the audio they love and connecting creators with the fans who'll find meaning in their art, and who won't just follow their career, but will sustain it."

Over the past two decades, streaming has fundamentally changed the audio ecosystem. It's lowered barriers to entry and it's democratized access to audio for listeners.

Spotify recognized that consumers would want to listen anywhere, and at any time, and that mobile devices therefore would be an essential path for providing music to consumers. Spotify accordingly developed an app making its streaming services available over Apple devices, which was added to the App Store in September 2009.

Spotify offers two basic types of streaming services. Our "Free," is free to the consumer but includes advertisements interspersed with the consumer's streaming selections. Our "Premium, " offers ad-free music and offline listening and carries a $9.99 monthly charge.[10] Most consumers at first select the Free service, but many—after experiencing the benefits of Spotify's service—switch to Premium in order to take advantage of its benefits.

For the first two years that Spotify's app was in the App Store, Apple did not offer any in-app purchasing functionality for digital subscription services like Spotify. Accordingly, there were no rules preventing Spotify from directing its users to its web site to subscribe to our Premium service directly with Spotify.

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[10] In the U.S., Spotify also offers Premium Student for $4.99/month for eligible college students and Spotify Premium Family for $14.99/month for up to 6 family members who live together.

Two years later—in 2011—Apple dramatically changed the rules applicable to Spotify's app.

It adopted a new rule requiring Spotify to use Apple's payment processing system, which Apple calls "in-app Purchase" or "IAP," for any in-app payments. And it prohibited links to any payment mechanisms located on the seller's website or anywhere else outside the app. Apple charges 30% of the purchase price for use of this system—an amount dramatically greater than the 3-5% that other payment methods typically charge sellers.[11]

The reason for this new rule was to enable Apple to eliminate competitors for downstream services provided by Apple. That is clear from contemporaneous emails between Steve Jobs and his subordinates:[12]

- In November 2010, Philip Schiller, an Apple executive, reported to Jobs regarding a television advertisement for Amazon's Kindle electronic book reader that depicted a consumer using her iPhone to purchase and then read a book, and then switching to an Android phone and continuing to read the same book. He observed that the ad's primary message was that "there are Kindle apps on lots of mobile devices," but that the secondary message was "that it is easy to switch from iPhone to Android." In a subsequent message the next day, Schiller observed that Apple had anticipated that users typically "would be buying books on a Kindle device and later accessing them on an iPhone," but "more often Kindle app users are purchasing digital books right on their phones" and therefore should be required to use IAP. Jobs responded by suggesting that the appropriate response was that Amazon "must use our payment system for everything, ... If they want to compare us to Android, let's force them to use our far superior payment system."

- In another exchange several months later, Jobs was more explicit: "iBooks is going to be the only bookstore on IOS devices. We need to hold our heads high. One can read books bought elsewhere, just not buy/rent/subscribe from IOS without paying us, which we acknowledge is prohibitive for many things."

Spotify at first sought to comply with Apple's new rule by making it impossible for customers to purchase Premium service from a link within the app—and requiring them

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[11] In addition, requiring the use of IAP enables Apple to prevent app developers from establishing a direct billing relationship with their customers, and instead lets Apple capture sensitive customer information. The App Store rules make clear that Apple may use that information for any purpose. *See* Section 9.3 of Apple's Developer Program License Agreement.

[12] Hartley Charlton, *Emails Reveal Why Steve Jobs and Phil Schiller Blocked In-App Purchase of Kindle Books*, MacRumors (July 31, 2020), https://www.macrumors.com/2020/07/31/emails-apple-blocked-kindle-purchases/.

instead to go to Spotify's website to make such purchases. That artificial arrangement significantly disadvantaged Spotify by making it much more difficult for customers to sign up for Premium service. And Apple repeatedly pressured Spotify to adopt the IAP system, eventually taking the position that Spotify's failure to incorporate the IAP payment violated its rules even if all purchases took place outside of the app.

In 2013, Apple threatened to ban Spotify from the App Store unless it incorporated IAP into its app. Spotify in 2014 therefore incorporated IAP and—to cover Apple's 30% tax—raised the cost of Premium to $12.99.[13]

It was not a coincidence that at the same time Apple was forcing Spotify to use IAP, Apple (also in 2014) acquired a music streaming service, Beats Music. In 2015—a year after Apple had effectively forced Spotify to increase its price—Apple introduced Apple Music, a streaming service competing directly with Spotify, priced at $9.99. Apple, of course, did not have to bear the cost of the 30% tax it imposed on Spotify.

Spotify recognized that it could not compete with Apple's lower price and in May 2016 eliminated IAP, which required it to forgo any in-app purchases of Premium and any in-app upgrades from Free to Premium. After Spotify removed IAP, it gave app users an opportunity to click on an "Email Me" button that would send an email informing the customer of an opportunity to upgrade to Premium at a discount. Apple unilaterally added new App Store restrictions, barring not only links to outside-app payment services but also any "calls to action that direct customers to purchasing mechanisms other than IAP."

In other words, Apple retroactively outlawed Spotify's defensive move by unilaterally changing the rules that govern the App store. Apple repeated this pattern over the years, broadening its view of prohibited conduct both in the language of its rules and in their abusive enforcement, in order to punish app developers who chose not to implement Apple's IAP.

Spotify is prohibited even from informing its customers about the opportunity to sign up for Premium on Spotify's own website. And Apple interprets this restriction broadly, to prohibit Spotify from advertising promotions in its app (for example, opportunities to sign up for Premium at a discounted price) and, more remarkably, from using non-app communications (such as email) to make such offers to consumers.

The bottom line is that Apple's unfettered and unilateral power to impose its web of restrictions effectively prevents head-to-head competition between Spotify and Apple

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[13] Spotify could not absorb the IAP tax without raising its prices, because a large component of its costs are the licensing fees paid to record labels and music publishers. Apple, of course, would have been well aware of that cost structure because it also is in the music streaming business.

Music based on consumers' assessments of the quality of the two services. Apple instead has aggressively used its App store policies to handicap Spotify in numerous ways: forcing Spotify to choose between a price increase that would render its offering uncompetitive, and restrictions that make it much more difficult to communicate discount offers and other opportunities and, more generally, anything that would enable customers to purchase its service. One doesn't need a Ph.D. in economics to recognize that Apple is hurting consumers by forcing competitors either to charge higher prices or preventing competitors from communicating offers of discounts or other promotional offers.

Consumers are harmed because they are prevented from making informed choices: Apple deprives them of information relevant to their choice of streaming provider, such as the availability of discounts. And Apple's actions reduce innovation, because Apple's competitors have reduced incentives and financial ability to innovate.[14]

Apple's treatment of Spotify has ***not*** been applied across-the-board to all apps in its App Store. Rather, Apple singles out apps that compete with Apple's own products—music streaming, video streaming, on-line games, and others. The IAP requirement does not, for example, apply to tickets from Ticketmaster or an airline; a mobile coffee order at Starbucks; every single physical good consumers "buy now" on Amazon's app; food ordered from GrubHub; a ride on Uber; and numerous other apps that do not provide for online delivery of services purchased by the customer.[15]

The reason for this starkly different treatment is clear: Apple is leveraging its App Store power to insert itself as a gatekeeper between these app developers and their customers—and impose added costs and communication restrictions that make Apple's competing downstream services more attractive to those customers. Numerous analysts have explained that the market for Apple devices is saturated and Apple's opportunities for future growth lie in convincing consumers to purchase downstream services like Apple Music. Apple therefore is using its control over the App Store to artificially disadvantage its downstream competitors and to give itself an artificial advantage.

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[14] Apple recently changed its IAP tax—it charges 30% for the first year and then reduces the amount to 15% once a recurring subscription has been active for more than a year. This change does not meaningfully ameliorate the adverse impact of Apple's revenue share. At the decisive moment—a consumer's initial purchase—the 30% fee still applies. That is particularly problematic for developers whose apps compete with Apple's own services, because Apple is unencumbered by the tax and is therefore able to price more competitively at the very point in time when a consumer chooses which app to use.

[15] Remarkably, in the midst of the COVID pandemic Apple decided that home education apps and exercise apps were subject to these fees and restrictions, even though before the pandemic they were not. Jack Nicas and David McCabe, *Their Businesses Went Virtual. Then Apple Wanted a Cut.*, N.Y. Times (July 28, 2020), https://www.nytimes.com/2020/07/28/technology/apple-app-store-airbnb-classpass.html.

Indeed, one analyst frankly recognized Apple's ability to use its control over hardware devices to succeed in the services market: "Apple has evolved from a hardware company to a platform play that cross sells services into a growing installed base" and "is in a unique position of being able to drive Services growth by leveraging its 1.65 billion active user installed base."[16]

Apple's naked use of its App Store power to disadvantage competitors dwarfs the abuses of market power that have been condemned in the past. For example:

- Standard Oil controlled the price and availability of oil. It did not condition the availability of fuel to purchasers of gas furnaces or automobiles on the payment to Standard of 30% of the purchase price of those furnaces or cars and/or restrict the ability of furnace and car manufacturers to communicate with their customers.

- AT&T was accused of using its power over local telecommunications networks to make it difficult for competing equipment and long distance services providers to access customers. AT&T did not contend that it could condition access to customers on payment of 30% of its competitors' revenues for sales of equipment and long distance services or prevent those competitors from offering discounts or other favorable terms to their customers.

- Microsoft did not demand a 30% cut of all revenues obtained through a Netscape browser or other applications that ran on Windows. And it did not attempt to regulate communications to consumers from the websites reached through the browser or from other applications.

Apple's abuse of power is thus dramatically greater, and reaches far more broadly into the economy, than past conduct that was seen to clearly violate fundamental antitrust principles by unjustifiable leveraging market power.

Apple has made a few attempts to justify its actions, but they are transparently false.

For example, Apple often accuses developers like Spotify of complaining about App Store terms that we originally agreed to and have been in place already for years. Quite the opposite is true. In fact, what developers experienced was a classic "bait and switch." As I've explained, Apple changed the rules after it had attracted third-party developers and used

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[16] Chris Forrester, *Bank: "Apple moving from hardware to services,"* Advanced Television (Mar. 29, 2021), https://advanced-television.com/2021/03/29/bank-apple-moving-from-hardware-to-services/; *see also* Kirk McElhearn, *How Apple is changing from a hardware company to a services and media company*, Intego (Nov. 13, 2018), https://www.intego.com/mac-security-blog/how-apple-is-changing-from-a-hardware-company-to-a-services-and-media-company/.

their innovative products and services to drive sales of Apple devices. And it changed the rules in order to increase costs of competitors in downstream markets—thereby preventing competition on the merits.

Second, Apple claims that its App Store restrictions protect user privacy and security. Those concerns are important, and Spotify works hard to protect its users' privacy and to provide strong security.

But Apple can't seriously contend that its IAP requirement, and associated 30% tax, are necessary for privacy and security when Apple itself admits that 70% of the applications in the App Store utilize alternative payment systems every day—in millions of transactions. By recognizing that those alternative payments systems provide privacy and security protections satisfactory to Apple, those app developers, and their customers, Apple makes clear that its privacy and security claims have no basis in reality.[17]

Apple's motivation is clear. It wants to force consumers to utilize Apple's own downstream services in order to obtain increased services revenues to compensate for stagnating hardware revenues and also to prevent consumer defections to other platforms. Thus, a recently-disclosed statement by an Apple executive observed that consumers were less likely to "leave[] Apple's products once they've bought apps, music, movies, etc." Or, as Steve Jobs put it: Apple wants to "tie all of its products together, so [Apple] further lock[s] customers into [its] ecosystem."[18]

Finally, and even more incredibly, Apple argues that it has no market power—asserting that consumers could switch to Android devices if Apple abused its unlimited App Store authority. But simple common sense demonstrates that such a switch is highly unlikely. One factor is the high up-front cost of purchasing an iPhone, which makes a consumer reluctant to discard the iPhone and purchase an Android phone. The other is the significant costs of switching, such as (1) the need to replace accessories that are incompatible with other mobile devices or that work better with Apple devices (such as the Apple Watch or AirPods); (2) the difficulty of transferring pictures, music, contacts, text messages, and other data to a new mobile device; (3) losing the benefits of interoperability between Apple

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[17] Apple's "security and privacy" claims are further undermined by information uncovered in Epic Games' antitrust action against Apple. For example, the human review process takes thirteen minutes for new apps and six minutes for updates to existing apps; reviewers are expected to review 50-100 apps per day and their "productivity" is tracked; and the team responsible for detecting fraud and abuse described the review as the equivalent of "bringing a plastic butter knife to a gun fight". Findings of Fact and Conclusions of Law Proposed by Epic Games, Inc. ¶¶ 521.a. & b., 529.a. & b., *Epic Games, Inc. v. Apple Inc.*, No. 4:20-cv-05640-YGR-TSH (N.D. Cal.) (Dkt. 407).

[18] *Id.* ¶¶ 72, 53.

devices (such as iPhones and iPads); and (4) the opportunity cost of learning how to operate that new mobile device. Academic studies confirm that conclusion.[19]

There can be no serious debate that Apple has tremendous market power, which it is abusing to benefit itself and harm consumers and competitors.

Congressional Action Is Urgently Needed

Given Apple's obvious abuses, it is reasonable to ask whether current antitrust principles can be invoked to prevent Apple's anticompetitive use of its App Store authority. We believe they can and should be, and have been urging U.S. authorities to take action for years.

Indeed, I was a lawyer at Microsoft during the heyday of its antitrust woes. As a senior lawyer and eventually the company's General Counsel, I took the lessons from that case seriously. Apple's behavior is exponentially worse than anything that had given rise to the "case of the century" that I witnessed at Microsoft.

Unfortunately, antitrust principles applicable to unilateral conduct by dominant firms have evolved to the point where courts are often overly deferential to even clearly anticompetitive conduct. And, conscious of the uncertainty in the courts, our enforcement agencies may hesitate to bring cases to stop such conduct. Fearing the consequences of over-enforcement errors, we've instead bearing the adverse consequences of under-enforcement errors.

Spotify has reached out to the European Commission for help. In March 2019, we filed a complaint detailing Apple's anticompetitive acts and behavior, and the harm inflicted on both consumers and competition. Since that time, the Commission has opened an investigation and we are optimistic that formal charges against Apple are coming soon.

Recognizing the limitations on the speed at which traditional antitrust enforcement actions can be resolved, and the reality that their pace often renders them ineffective in fast-changing technology markets, European lawmakers are now considering the "Digital Markets Act" that would establish a clear set of prohibitions and obligations for the conduct of dominant digital gatekeepers. We welcome that development and see it as an important step to address some of the shortcomings of traditional enforcement.

I strongly believe the time for Congress to act is now. I urge you to enact legislation that constrains the power of these dominant technology platforms, and puts control and choice back in the hands of the people.

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[19] *See, e.g.*, Lukasz Grzybowski & Ambre Nicolle, *Estimating Consumer Inertia in Repeated Choices of Smartphones* 30 fig. 3 (CESifo, Working Paper No. 7434, 2018), https://papers.ssrn.com/sol3/-papers.cfm?abstract_id=3338788

We appreciate and support the broad antitrust reform proposed by Chairwoman Klobuchar along with Senators Blumenthal and Booker because it will make Section 2 cases less challenging for the government. The proposed legislation would reset the law to recognize the considerable power that dominant firms exercise in the real world, empower enforcers, and set courts on a path which would enable them to better address abusive unilateral conduct. We believe this legislation would be a welcome and important part of what needs to be done. Senator Hawley recently proposed a bill that incorporates a number of similar approaches.

However, that reform alone is not enough.

Realizing the benefits of these changes in basic antitrust law will take a considerable time. Just as the law took decades to evolve to its current state, the changes contemplated by the proposed legislation would similarly take many years to work their way through courts and cases.

Moreover, traditional antitrust enforcement often comes too late and too slow, with inadequate clarity and deterrent effect, and therefore is often ineffective at preventing serious and often irreversible harm to competition, consumers, and competitors. Relying on litigation grounded in general antitrust principles runs the risk of turning competition enforcement efforts—no matter how well-intentioned—into a kind of "archeological expedition," where enforcers dig up the bones of a dinosaur and try to determine whether a meteor or another dinosaur killed it. By then the harm to competition in the market is irreparable.

App markets simply are too important to the economy for corrective action to be delayed until after irremediable harm has already occurred. And with rapid adoption of new platforms and interfaces like voice assistants, virtual reality and the internet of things, we can anticipate the same patterns of conduct by these gatekeepers to leverage their power to control these new technologies as well. The tools available to antitrust enforcement authorities should enable timely and effective intervention.

Some state legislatures have begun to recognize the legislative vacuum and have begun debating the need for targeted legislation to address app store abuses. Among Apple's objections to this legislation is that it should be adopted at the federal level. We agree. You should take them up on that challenge and seize leadership on this issue to bring clarity to the market.

In our view, changes are necessary to improve speed, efficacy, and clarity of application of the law. We have decades of learning and experience about dominant digital platforms and what conduct and behaviors tend to deter competition and protect and increase the market

power of these platforms. In fact, while the specifics of the technological platforms vary, the basic pattern of behavior is always the same, with the platform owner succumbing to the temptation to tilt the platform rules to its own advantage.

Enacting a clear set of rules would provide a certainty to the marketplace and improve the speed and efficacy that competition law investigations and enforcement actions sometimes fail to deliver.

When a dominant platform owner also competes on the platform, there is a major conflict of interest. Rather than delivering choice and competition to consumers, the platform has the incentive to protect its monopoly power and limit the development and growth of competing services.

When it comes to Apple's app store, in the absence of structural relief to address conflicts of interest, narrowly tailored refinements can go a long way to preserving competition. Specifically, we recommend:

- Prohibiting terms that require developers to use the platform's payment system exclusively for in-app purchases.
- Prohibiting the platform from imposing contractual gag orders that prevent developers from marketing lower prices, promotions, and new innovations to their own consumers.
- Requiring the platform to use open and documented interfaces to ensure that the platform owner's services interoperate on the same terms as its rivals.
- Prohibit unfair self-preferencing – for example, when users search for products in an app store.
- Prohibit retaliation through abusive app submission review processes.

Without immediate help and specific rules, Apple and other gatekeepers will entrench their monopolies and control innovation in adjacent markets for decades to come.

Conclusion

We are at a time in history where the need for action to rein in the power of these digital giants has become clear to almost everyone. The health of the digital economy and competitive landscape is at stake. Consumer choice is at stake.

You can act now, both to reset the antitrust laws, and to enact targeted prohibitions that will stop abusive conduct by app stores that today is harming consumers and our entire economy.

Thank you, and I look forward to answering the Subcommittee's questions.

Statement of Kyle Andeer
Apple Inc.

U.S. Senate Judiciary Committee
Subcommittee on Competition Policy, Antitrust, and Consumer Rights

Hearing on "Antitrust Applied: Examining Competition in App Stores"

April 21, 2021

Chairwoman Klobuchar, Ranking Member Lee, and Members of the Subcommittee, my name is Kyle Andeer, and I am Apple's Chief Compliance Officer and Vice President of Corporate Law. I appreciate the opportunity to offer testimony about Apple's App Store.

Some of you may have an iPhone with you right now—I hope that's the case because we believe our products deliver the best possible customer experience. We know that you have a lot of choices in the marketplace, and we know that we need to earn our relationship with you. To do that, we work constantly to innovate, focused always on your privacy and security.

The App Store is one of our most important innovations. It is a critical feature of iPhone, which combines the benefits of software applications and the security of a curated experience. The App Store provides customers access to nearly two million apps, allowing you to hail a ride, order dinner, monitor your health, play a game, listen to music, communicate with business associates, and so much more—all from your iPhone.

Amazing as that is for customers, I think the App Store's real success is the opportunity it has created for software developers to build and distribute all of those apps in the first place. Today, an entrepreneur with a great idea can use the App Store to build an app and instantly reach customers across the entire world—all from her home.

It's easy to take that for granted—but it wasn't always this way. When we introduced the App Store in 2008, creating software was difficult and expensive. Developers had to pay for the tools they needed to build and test their products; then they had to distribute those products, either over the Internet (which had trust and security issues) or through physical disks (which required costly shelf space in brick-and-mortar stores). It's little wonder that options were fairly limited and expensive back then.

The App Store changed all of that. It truly revolutionized software distribution.

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First, we strive to make the App Store a safe and trusted marketplace in which customers can discover a great variety of curated options. That idea of curation is important to us—in part because it's important to your privacy and security. Your iPhone is not just a phone—it contains some of your most sensitive information—photos of your kids, financial and health information, the controls to your home security system, and sensitive communications between business

associates. Because of that, bad actors from around the world try to infiltrate devices using malware—it's like a Trojan horse that tries to get into your phone and wreak havoc.

We won't tolerate that. We review every app in the App Store to make sure it meets standards for privacy, safety, security, and performance. Each week, we review about 100,000 submissions, and we reject about 40% of them because they don't meet those standards. And we know that our approach works: studies show that iPhone has far fewer malware infections than other devices. Alternatives like side-loading would render the strong privacy and data security protections we offer customers moot, and given all of the threats to data these days, we don't think that makes sense.

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Second, we have invested significantly to improve the iOS ecosystem, including by providing developers the tools they need to build apps. That includes machine learning, cloud storage, testing software, and over 250,000 application programming interfaces that unlock the magic of iPhone. Because of that, a developer can build an app that lets you deposit a check by taking a picture of it with iPhone's camera, log into an app using Face or Touch ID, play a game or listen to music with iPhone's audio and video technologies, or provide navigation using GPS. Apple built those (and so many other) capabilities into iPhone, and now developers—including many that compete with Apple—can leverage them for their apps.

So the App Store isn't just a store. It's like a studio stocked with canvasses, brushes, and paint—the tools artists need to create their works—*and* it's a gallery where they can display and sell their creations. And *that* is how the App Store empowers *everyone* to build apps, from elementary school kids to small businesses—not just the big guys.

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Third, the App Store is a great value for developers. We do not charge for shelf space in the App Store. Instead, we charge a commission in one situation—where a developer acquires a customer *in* the App Store and sells a digital good that is used *on* the iPhone. As a result, the developer keeps 100% of the money she makes for the vast majority of apps on the App Store (about 85% of them). The commission charged to other developers initially was set at 30%, which flipped the economics of software distribution in the developer's favor. Thirty percent is a very competitive rate in very competitive markets, and it is a far cry from the rates charged for software distribution when the App Store was launched.

Since then, we have always lowered that commission; we've never raised it or added fees. Today, the commission for most developers who are required to pay one is just 15%. Last year, as many small businesses were struggling during the pandemic, and storefronts were closing around the country, we launched a Small Business Program, which cut the commission for developers making less than $1 million per year in the App Store. Many small businesses pay no commission at all, and those who do now pay less.

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We're proud of the store we've built, the experiences it has provided for customers, and the opportunities it has created for developers. Entirely new industries have been born, creating millions of jobs and billions of dollars in economic activity across all 50 states.

It's the sort of thing that is possible when competition is fierce and fair. Apple, after all, was started by tinkerers and dreamers, and we became successful over time because we had an opportunity to compete. We were in a street fight back then, and we still are today. And we like it that way because we know that competition spurs innovation and, with it, more and better choices for customers. We will continue to compete, to innovate, and to create. We will also look for ways to allow everyone, from the tinkerer in her garage to the developer in the coffee shop, to use our technologies to create something amazing.

That is why we are pleased to be part of this important discussion about competition. Thank you for the opportunity to participate today. I am happy to answer any questions.

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Written Testimony of Wilson White

Senior Director, Government Affairs and Public Policy, Google LLC

Senate Judiciary Committee

Subcommittee on Competition Policy, Antitrust, and Consumer Rights

"Antitrust Applied: Examining Competition in App Stores"

April 21, 2021

Chairwoman Klobuchar, Ranking Member Lee, and distinguished Senators of the Committee: Thank you for inviting me here today to discuss the Google Play ecosystem and the benefits it provides to millions of American consumers and developers.

My name is Wilson White and I am a Senior Director on the Government Affairs & Public Policy team at Google. In this role, I serve as the global policy lead supporting the Android and Google Play teams. I have been in technology for nearly two decades, both as a software engineer and technology lawyer. The technology landscape has evolved immensely over this period, fueled in large part by the explosion of innovation in digital content and services.

At Google, we believe that everyone should have equal access to the benefits of mobile devices. Before Android launched in 2008, the mobile ecosystem was highly fragmented and closed. Vertically integrated platforms were the norm. Compared to today, devices were more expensive with fewer quality services. The freedom, openness, and accessibility that Android and Google Play provide has helped to revolutionize the mobile ecosystem, as well as mobile app development and distribution.

In my testimony today, I will describe (1) why we built Android and Google Play and how they work, (2) how Android's open ecosystem has increased competition and

choice, (3) how Google Play helps developers and consumers, and (4) how we fund and sustain the continued evolution of Android and Google Play.

Why We Built Android and Google Play, And How They Work

Google experienced firsthand the challenges of app distribution in the early days of the modern mobile ecosystem. Developers often had to pay both device makers and mobile carriers for distribution. Both would commonly exclude third-party services that rivaled their own services. And because of technical fragmentation across the ecosystem, development costs were high. For example, we built around 300 slightly different versions of Google Maps for Symbian, a popular operating system which ran on many early mobile devices. These kinds of hurdles combined to make app development in that era slow, expensive, and risky for app developers. Such challenges caused poor user experiences, hampered app innovation and developer market entry, and slowed the growth of mobile. We introduced Android and Google Play to help solve these challenges.

There are a few key characteristics that define Android:

First, Android is a free and open source operating system, which we launched in 2008. It was a revolution and remains unique today. Anybody - even competitors - can use Android for free without any requirement to pre-load or download our apps, or use our services. Amazon, for instance, modifies the Android open source code to create its proprietary Fire OS, which is the heart of Amazon's device and digital content ecosystem. Similarly, thousands of companies use the Android operating system to build their technology and businesses. If you've exercised with a Peloton bike or used the in-flight entertainment system on a JetBlue plane, you've used products built using Android. Google charges these companies nothing for any of this.

Second, Android gives device makers and wireless carriers enormous flexibility. Companies that want to make Android-compatible devices can modify the software and compete on a differentiated user experience while maintaining basic compatibility standards. This flexibility means that a device maker can preinstall its own software, customize its user interface, and build a unique identity and brand while still running a fully compatible version of Android. The compatibility standards ensure that an app developer can build their app once, with the confidence that the app will run properly

on a wide range of devices from different manufacturers, including Android devices that do not have any Google apps or services. Compatibility standards help device makers by ensuring that there is a wide-ranging ecosystem of third-party software that will work on their devices. In addition, compatibility standards provide critical features that help ensure device security.

The availability of third-party software is important in making sure that a mobile device meets consumers' expectations. Consumers selecting between competing mobile devices need to understand which of their favorite apps will be available and work on those devices.

This is where app stores come in. App stores give consumers a place to find their favorite content for their mobile devices. Successful app stores build a trusted brand by providing a useful, interesting, and above all, safe place for consumers to learn about and engage with great content.

We built Google Play as our vision of an ideal Android app store. We aspire for Google Play to be the best destination to find the apps and digital content that bring an Android device to life. We provide a consumer experience, the online storefront that consumers come to in order to learn about and find the best apps and games, as well as a developer experience, the app development, distribution, commerce and performance analysis tools that help companies develop better apps and grow their businesses.

Through freedom, openness, and accessibility, today, Android and Google Play are the foundation for a thriving and competitive device and app ecosystem. Android runs on more than 2.5 billion devices around the world; Google Play has more than 2 billion 30-day active users; and millions of businesses use these services to reach consumers around the world. Our efforts are part of the reason why the broader mobile ecosystem is thriving: last year consumers downloaded 218 billion apps and venture capital investment in mobile tech grew 27% to $73 billion.[1]

How Android's Open Ecosystem has Increased Competition and Choice

[1] *"State of Mobile 2021." App Annie, 2021, www.appannie.com/en/go/state-of-mobile-2021/.*

Android's hallmark of openness and flexibility extends to the wide latitude device makers and carriers have in determining the character and features of their products. They are free to use Android without Google Play or any of Google's other services, and some preload Google Play as well as a competing app store. For example, many of Samsung's devices include the Samsung Galaxy Store with Google Play. In fact, most Android devices come with 2 or more app stores preinstalled.

This flexibility has proven enormously valuable to device makers, since it lets them focus on innovating in other areas, instead of devoting resources to building an operating system and nurturing an ecosystem of devices and services around that operating system.

Indeed, one of the things we are most proud of is how Android has enabled *others* in our industry to succeed. Android has been at the heart of important developments by a number of other companies. We launched the first Android phone in 2008. By 2018, there were 1300 brands of phones world-wide that used the Android operating system and over a million apps in Google Play.

Today, Android devices are pushing the limits of mobile device technology in exciting ways. Samsung and Motorola launched Android phones featuring the first foldable touch screens in the world. Similarly, Microsoft used Android in its folding Surface Duo tablet launched late last year. Because of Android, for consumers considering which mobile device to purchase, their choices are not limited to one, two, or even a handful of alternatives. More than 1,300 companies around the world make Android devices, and there are more than 24,000 different Android device models to choose from.

Some of these Android devices cost less than $100, which has made computing accessible to communities that had not been well-served by technology platforms in the past. Android is the most popular mobile OS in the U.S. and the world for these lower-priced devices. Android has helped democratize access to the internet and all the benefits of smartphones, making it easy for consumers to access digital content.

How Google Play Helps Developers and Consumers

Google Play is Google's global online digital content store, where we work to connect consumers to outstanding digital experiences and empower developers to do their

best work - helping them succeed by investing in tools and resources that support their growth.

Developers

Through freedom, openness, and accessibility, Android and Google Play have created untold opportunities: millions of developers have built thriving businesses on Android and Google Play, increasing competition and accelerating mobile innovation. In fact, as of February 2020, developers had earned $80 billion through Google Play. And in 2020, the Android app economy, including Google Play, helped create nearly 2 million American jobs — from software engineers and developers of mobile applications, to the marketing and human resources teams that support them.

For developers, our global reach and distribution puts their apps and games in front of billions of users globally — and we have invested in comprehensive tools, resources and infrastructure that help them build great apps, lower their development costs and grow their businesses. Take Florida-based Caribu for example. Founded in 2017 by Maxeme Tuchman and Alvaro Sabido, Caribu is an app that is re-defining the way that kids and families connect through interactive virtual playdates that integrate games, coloring, and books into video-chats. Through Google Play, Caribu has now helped hundreds of thousands of families enjoy virtual playdates across 200+ countries.

From helping developers write their first lines of code in Android Studio to sophisticated tools that help reduce testing burden, run beta tests, or monitor their app at scale, to name a few, we are focused on enabling developers to better serve their users. Our latest sentiment surveys of cross-platform developers show that this investment is working, as developer satisfaction with Google Play has grown each year.

Our developer education efforts share best practices to build a successful app or game business and keep developers updated on changes in our tools. The Google Play Academy for App Success is a free e-learning platform for developers, business people, and marketers of Google Play apps and games. The courses are completely free of charge.

Ultimately these tools have made app development more accessible and easier, and they allow developers to focus on innovating - reducing crash rates by 70% and

reducing app sizes by up to 65% (leading to more downloads and fewer uninstalls). In 2018 for example, our security tools helped 30,000 developers improve the security of over 75,000 apps.

We have accomplished this while giving developers choice and flexibility in app development and functionality. For example:

- There are alternatives to Google Play. Developers can distribute their app via many other Android app stores, directly to OEMs, or through direct downloads on their websites. And developers are free to contract directly with device makers or carriers to preload their apps on Android devices.
- Google Play allows developers to communicate directly with their users. Developers are free to use email marketing and other channels outside the app to provide promotional offers to their users. Google Play does not charge a subscription fee when a developer acquires a user outside of Google Play.
- Google Play provides developers with flexibility across platforms. We do not require app experiences, features, in-app purchases, or price parity, etc., across platforms. It is up to developers to decide how to manage their apps, and we support that flexibility. For example, a developer may decide (and would be free) to offer their digital content at a lower price on their website versus on Google Play. Likewise, developers decide whether or not to sell in-app purchases in apps distributed on Google Play. For example, if an app developer sells a subscription service outside of Google Play, users can still sign into their app and access the service, and Google Play will not charge a service fee.

Consumers

We have built Google Play with consumers in mind, helping them easily discover apps and games they will enjoy while also ensuring they have the protection and tools necessary to have a safe, secure, convenient and personalized experience.

- Play has built-in features to keep your device secure. Google Play Protect, our security solution, scans over 100 billion apps--even those not downloaded from Google Play--each day to make sure these apps are not behaving in harmful ways. In 2019, Google Play Protect also stopped 1.9 billion malware installs from non-Play sources.

- Play has features and options to help families ensure a safe online environment for children. Family Link parental controls empower parents to set appropriate ground rules and limits for their children's digital activity. For example, parents can require that they approve any purchases their children want to make.
- Play's billing system gives consumers a convenient, safe way to make purchases of digital content. Google Play makes it easy for users to choose the payment option most convenient for them. It offers gift cards to consumers in 875k+ retail locations, 177 direct carrier billing integrations in 66 markets, credit card integration in 150 markets, and payment service providers such as PayPal and locally preferred e-wallets across many more markets. To prevent any accidental purchases, our billing system, through a consistent purchase cart and user experience, ensures consumers will see the price and terms of any recurring payments prominently, and receive an email receipt after each payment. Consumers are also able to require authentication (for example, a password) anytime an item is purchased. And if something does go wrong, consumers can request a refund from Google. Consumers can see and manage all their subscriptions in one place on Google Play and, if they choose, set budgets to warn them when they are reaching their monthly spending limit.
- Play provides support to help developers make their apps more accessible. According to The World Bank, 15% of the world's population has some type of disability. People with disabilities depend on apps and services that support accessibility to communicate, learn, and work. Google provides support to developers in making their apps more accessible through best practices, guidelines and testing tools so that more consumers can take advantage of more apps.

How We Fund and Sustain the Continued Evolution of Android and Google Play

Our business succeeds only when our developer partners succeed and consumers view us as a trusted and enjoyable destination for digital content. A vast majority of the games and apps on our platform are free -- over 90% of apps on Google Play are free to consumers. For the developers who decide to charge for some of their digital content, most of them use a "freemium" model, where the initial download is free so consumers can test out the app at no cost, but can then buy additional content if they so choose. We do not charge for the range of services Google Play provides unless it results in a sale of digital content for a developer, and even then only for a sale made in the app itself. This model supports entry and innovation and allows developers small

and large to instantly reach a global consumer audience and choose the business strategy that best fits their needs.

When our standard fee does apply, it covers everything from essential security updates, managing app installs and updates, and a vast array of developer tools for building and maintaining a global marketplace. Beyond our investments in the ecosystem, Google incurs other costs, such as payments to partners like mobile carriers. Similarly, the investment we make in the platform itself is substantial and it is not easy to sustain. We employ thousands of people dedicated to Android and Google Play, including engineers, designers, trust and safety reviewers, developer relations, and other roles.

This fee also reflects the substantial value of our distribution services and is competitive with industry practices that have existed long before Google Play was built: PC stores such as Steam, GOG, and the Microsoft Store; console stores such as the Playstation, Xbox Games, and Nintendo eSHOP; physical stores such as Gamestop, Amazon, Best Buy, and Walmart; and app stores such as as Apple, Samsung, Microsoft, and Amazon all charge similar fees.[2] This list does not include a number of distributors who charge a much higher fee.

That said, we are always trying to support innovation and development on Android devices where we can. This is why Google Play announced a fee reduction just a few weeks ago. Starting on July 1, we are reducing the service fee Google Play receives when a developer sells digital goods or services to 15% for the first $1 million of revenue every Play developer earns each year regardless of size. With this change, 99% of developers that sell digital goods and services with Play will see a 50% reduction in fees. These are funds that developers can decide to use as they see fit—for example, to scale up at a critical phase of their growth by hiring more engineers, adding to their marketing staff, increasing their server capacity, and more. We believe this is a fair approach that keeps our fees competitive with the industry, and aligns with Google's broader mission to help all developers succeed.

We believe the value proposition of Google Play is a strong one. But in the Android ecosystem if a developer feels that the value proposition of Google Play is not

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[2] "Apple's App Store and Other Digital Marketplaces: A Comparison of Commission Rates." Analysis Group, July 22, 2020, https://www.analysisgroup.com/globalassets/insights/publishing/apples_app_store_and_other_digital_marketplaces_a_comparison_of_commission_rates.pdf.

adequate, they can distribute their apps in a number of other ways, including directly to consumers via their website, through their own app store, through other third party app stores, or through pre-loading arrangements with device manufacturers and/or mobile carriers.

Conclusion

We are committed to providing a safe and engaging experience for developers and consumers around the world who upload, download, and stream amazing apps, games, books, and movies every day. Creating a global platform with access for all and providing useful tools for developers has been our goal since we launched the very first Android device. We are proud that our bet on openness has resulted in success for consumers, device makers, mobile carriers, developers and a wide range of other businesses. It has also lowered costs and created more choice for consumers, all while creating nearly 2 million jobs here at home. As consumer demand for digital content and Android devices evolve, so will Google Play, and we look forward to bringing developers and consumers the very best digital discovery and store experience well into the future.

We appreciate the Committee's interest in these issues and the opportunity to contribute our views.

Senator Amy Klobuchar
Questions for the Record

Questions for Mr. Kyle Andeer, Apple
The House Antitrust Subcommittee's Digital Markets Report cited estimates that Apple makes between 15 and 18 billion dollars per year on the App Store.

- Please provide detailed information about revenues, costs, and margins for each of the last three fiscal years for your app store. If precise figures are not available, provide estimates. If ordinary business course financial statements with data about the profitability of your app store exist, please provide copies of those.

At the hearing, we heard testimony that Apple restricts app developers from sharing information with users about lower priced offerings available outside the app store.

- How many apps did Apple communicate with about possible Apple App Store Guidelines violations related to providing information "that direct[s] customers to purchasing mechanisms other than in-app purchase," or any other similar Guidelines provision in each of the last three fiscal years? For any affected app with more than $1 million in annual App Store revenue, provide details of the circumstances.

Senator Josh Hawley
Questions for the Record

Kyle Andeer
Chief Compliance Officer, Apple

1. **Please provide a list of any agreements between Apple and third-party App Store developers permitting the payment of commission percentages lower than the standard 30% commission on individual purchases. Please exclude any agreements contracted pursuant to the small developer program introduced by Apple in 2020.**

2. **Please provide a list of all categories of apps, such as "premium subscription video entertainment providers," to the developers of which special commission-payment agreements are extended. Please exclude any agreements contracted pursuant to the small developer program introduced by Apple in 2020.**

3. **Please provide a list of any requests to enter into similar agreements by other third-party App Store developers that Apple decided not to pursue, as well as Apple's reasons for deciding not to enter such agreements. Please exclude any agreements sought pursuant to the small developer program introduced by Apple in 2020.**

4. **On the basis of what factors did Apple designate "premium subscription video entertainment providers" for special App Store commission treatment?**

5. **For each of fiscal years 2015 through 2021, please provide a breakdown of the percentage of App Store commission payments directed to App Store security, device compatibility, and user privacy initiatives.**

Questions from Senator Thom Tillis
for Kyle Andeer, Apple

1. It should come as no shock that I want to ask about your ongoing anticompetitive actions towards Epic Games, a wonderful North Carolina company. Now, I'll concede that your monopolies on the App stores are legal. My concern is that you may be using that monopoly to dominate the secondary market for app distribution. How is this secondary market dominance different from the situation with Microsoft in the 90's: a legitimate monopoly over Windows that was extended illegally to the secondary market in web browsers?

2. How is the app store different from IOS?

3. How much control do you exert over your devices and app stores? I understand and appreciate that there are many benefits to the integration of IOS and the app store, benefits that directly impact consumers. But in a sense, all of that is beside the point. Abuses of market power aren't excused just because they're sometimes helpful. Remember, classical monopolies like Standard Oil and Bell Telephones had benefits too.

4. I'd like to about the removal of Parlor from the App store in response to the events of January 6. Now, I want to be clear, I'm not defending the content that is posted on Parlor. I find much of it to be offensive and reprehensible. But, as a society, we've placed a premium on all speech, even speech we may find offensive. I'm a firm believer in the free exchange of ideas, even ideas I don't agree with .Now, I'm not suggesting that the First Amendment applies to you. It doesn't. You're not the government. But, I do think—based on your market dominance—and the fact that you can literally control access to millions of people's speech and expression of ideas—antitrust law may require to make your services available on fair, reasonable, and non-discriminatory terms for most services. Now, that obviously doesn't include things whose purpose is to facilitate illegality, but that clearly isn't the purpose of Parler.

    a. Do you agree that you have a duty under antitrust law to do business with all parties, again, provided their purpose isn't to facilitate illegality?
    b. Given your sheer size and control of the market, why shouldn't we regulate you in such a manner? How are you any different from other market actors that we require to do business with all actors?

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Tile, Inc.
1900 S. Norfolk St. Ste. 310, San Mateo CA 94403
www.tile.com

September 9, 2022

Richard Durbin
Chair
United States Senate
Committee on The Judiciary

Dear Chairman Durbin,

Thank you for submitting the following Question for The Record to Tile, Inc. (Tile):

> Recent studies have argued that ad delivery on the Facebook platform can be skewed by gender or race due to hidden algorithmic optimization by the platforms, even when not requested by the advertisers. Are your algorithms using age, gender, race or other prohibited characteristics to deliver employment, housing, or credit ads based on ad relevance, even when an advertiser does not desire those characteristics to be used?

I am pleased to respond on behalf of Tile as follows:

Tile does not serve revenue-generating advertisements within the Tile app or website. Tile's business is solely centered around providing meaningful products and services that provide peace of mind to its customers and helping them locate the items that matter most to them. As such, Tile necessarily has no algorithms that use age, gender, race or other prohibited characteristics to deliver any ads based on ad relevance, period.

Very Truly Yours,

DocuSigned by:
Kirsten Daru
DDF36046E12B4B1...

Kirsten Daru

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Questions from Senator John Kennedy
for All Witnesses

1. Recent studies have argued that ad delivery on the Facebook platform can be skewed by gender or race due to hidden algorithmic optimization by the platforms, even when not requested by the advertisers. Are your algorithms using age, gender, race or other prohibited characteristics to deliver employment, housing, or credit ads based on ad relevance, even when an advertiser does not desire those characteristics to be used?

Match Response: Match does not use or allow information about any protect class to be used in the delivery of ads. Match does not share ***any*** user data with third parties.

Questions for the Record

U.S. Senate
Committee on the Judiciary
Subcommittee on Competition Policy, Antitrust, and Consumer Rights

The following questions were addressed to Horacio Gutierrez. Mr. Gutierrez is no longer at Spotify, so Dustee Jenkins, Global Head of Public Affairs, is responding on behalf of Spotify.

Questions from Senator John Kennedy

1. Recent studies have argued that ad delivery on the Facebook platform can be skewed by gender or race due to hidden algorithmic optimization by the platforms, even when not requested by the advertisers. Are your algorithms using age, gender, race or other prohibited characteristics to deliver employment, housing, or credit ads based on ad relevance, even when an advertiser does not desire those characteristics to be used?

We work closely with our U.S. advertising partners and do not permit employment, housing, or loan/credit advertisers to use gender, race or zip code for the purposes of targeting advertising campaigns within the Spotify advertising platform. As an overall matter, Spotify only permits age targeting for advertising campaigns for ages 18+, to avoid serving those ads to younger audiences. For loan/credit advertisers, we do permit age targeting for advertising campaigns, however this is limited to only two age groups (+18) and (+25).

Questions from Senator Thom Tillis

1. While today's hearing seeks to investigate the App market and anticompetitive behavior, I understand Spotify uses antitrust protections that were not meant for digital streaming platforms to devalue songs it must license. Spotify, along with other digital services, have fought to keep antiquated consent decrees to pay songwriters below market rates. They also led efforts to appeal a decision by the Copyright Royalty Board that would have increased songwriter pay. Mr. Gutierrez, Spotify is the world's largest streaming service valued at $72 billion and has significant market power with respect to songwriters and their publishers. How can it be advocating for fairness and a level playing field in the App market, while fighting against fairness and equitable compensation to songwriters in the music market?

Spotify pays out more royalties than any other streaming service and our approach to paying for publishing rights is generally in line with other DSPs. We are committed to working with publishers and songwriters to find a fair balance between valuing their work and operating a sustainable streaming platform, as well as with others in the music ecosystem.

In 2021, Spotify paid out over $7 billion in music royalties. Even adjusting for inflation, this amount is the largest annual sum paid by one retailer to the music industry in history, including at the height of the CD or digital download era. In 2021, both the recorded music and the music publishing sectors were able to report record revenue, driven by streaming. We believe that the continued growth of music streaming will be to the benefit of all stakeholders, including songwriters.

Regarding the recent CRB rate-setting known as "Phonorecords III", covering the years 2018-2022, songwriters received an unprecedented increase in their royalty rate, which moved from 10.5% to 15.1%. On August 31, 2022, the Digital Media Association (DiMA), the National Music Publishers' Association (NMPA), and the Nashville Songwriters Association International (NSAI) jointly announced a settlement of the rate-setting known as "Phonorecords IV," covering the years 2023-2027. That agreement establishes an escalating higher so-called headline rate of up to 15.35%, as well as adjusting other components of the rate. It ensures that services like Spotify can continue to innovate and attract new subscribers into the music ecosystem and that all parties will benefit from the continued growth of the industry.

Responses to Questions for the Record
U.S. Senate Committee on the Judiciary
Subcommittee on Competition Policy, Antitrust, and Consumer Rights
"Antitrust Applied: Examining Competition in App Stores"
April 21, 2021

Wilson White
Senior Director Public Policy & Government Relations, Google, Inc.

Written Questions submitted by Sen. Klobuchar to Wilson White

Question 1. Please provide detailed information about revenues, costs, and margins for each of the last three fiscal years for your app store. If precise figures are not available, provide estimates. If ordinary business course financial statements with data about the profitability of your app store exist, please provide copies of those.

We publicly report our financial results for Google Play as part of the Google Services segment of our business. Google Services includes products and services such as ads, Android, Chrome, hardware, Google Maps, Google Play, Search, and YouTube. Google Services generates revenues primarily from advertising; sales of apps and in-app purchases, digital content products, and hardware; and fees received for subscription-based products such as YouTube Premium and YouTube TV. Our quarterly and yearly consolidated operating income numbers for all our business units — including Google Play as part of Google Services — are detailed in our public filings, available at https://abc.xyz/investor/.

These filings include information on various factors impacting Google Services revenues, which consist of revenues generated from advertising, as well as revenues from other sources (including Google Play and the other products and services included in Google Services). For example, our most recent Form 10-Q filing (available at https://abc.xyz/investor/static/pdf/20220726_alphabet_10Q.pdf?cache=de538c8) notes that the decrease in Google Services revenue from other sources was primarily driven by a decrease in Google Play revenues, partially offset by growth in YouTube non-advertising revenues. As the filing indicates, the decrease in Google Play revenues was primarily driven by fee structure changes announced in 2021 and a decrease in buyer spending.

Written Questions submitted by Sen. Kennedy to Wilson White

Question 1. Recent studies have argued that ad delivery on the Facebook platform can be skewed by gender or race due to hidden algorithmic optimization by the platforms, even when not requested by the advertisers. Are your algorithms using age, gender, race or other prohibited characteristics to deliver employment, housing, or credit ads based on ad relevance, even when an advertiser does not desire those characteristics to be used?

No. As part of a collaboration with the U.S. Department of Housing and Urban Development in 2020, we launched a new policy to prohibit housing, employment, and credit advertisers from targeting ads based on age, gender, family status, or ZIP Code, in addition to our longstanding policies prohibiting targeting based on sensitive categories like race. More information on this collaboration is available at https://www.hud.gov/press/press_releases_media_advisories/hud_no_20_079, and our policy at https://support.google.com/adspolicy/answer/9917652?hl=en.

Coalition for APP FAIRNESS

April 21, 2021

The Honorable Amy Klobuchar
Chairwoman
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Committee on the Judiciary
U.S. Senate
Washington, DC 20515

The Honorable Mike Lee
Ranking Member
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Committee on the Judiciary
U.S. Senate
Washington, DC 20515

RE: Subcommittee Hearing on Antitrust Applied: Examining Competition in App Stores

Dear Chairwoman Klobuchar and Ranking Member Lee:

The Coalition for App Fairness is an independent nonprofit organization created by app developers of all sizes to advocate for freedom of choice for American consumers and fair competition for businesses dependent on the current mobile app store marketplace. The Coalition is dedicated to the promotion of a competitive system for app distribution across the app store ecosystem and ending the flagrant abuses of power perpetuated by dominant digital platforms. Our vision is set out in ten Principles of Fairness that should guide the conduct of app store owners.

Dominant mobile platforms like Apple have gained and maintained monopoly power over app distribution, creating captive audiences for the app stores tied to their mobile devices. They have used this power to impose abusive terms and conditions through their app stores. This unchecked power has resulted in harm to businesses and consumers through increased prices, decreased choice and information, stifled innovation, and unfair competition.

- **Dominant digital platforms abuse their market power to lock consumers and developers into their proprietary app stores, barring competing services**

First, large mobile device platforms mandate exclusive use of their proprietary app stores and bar consumers from using competing app stores on their devices. For example, an iPhone user may only use Apple's App Store—they cannot use the Google Play Store or other competing offerings on the iPhone. Because switching costs for mobile devices are high and competing app stores are prohibited, consumers buy a device and become locked into a particular app store ecosystem for good. Application developers, whose economic viability depends on reaching those consumers, have no choice but to distribute via the App Store. This combination of locked

in users and developers who cannot refuse to develop for the mobile device platforms creates significant monopoly control.

➢ **Dominant digital platforms tie their app stores use to exclusive payment processing systems, diminishing choice and innovation, while raising prices for consumers and developers**

Second, the dominant mobile platforms tie app distribution to their own payment processing services within an app, known as "In App Payment" or IAP. Apple mandates that third-party apps use its payment processing system exclusively in the App Store. Google announced that it will implement the same policy for its Play Store beginning in September 2021. Importantly, the platforms only demand this from developers which sell so-called "digital goods" like content subscriptions or upgrades in mobile games.

These practices mean app developers and their customers have no choice as to which payment system they use. They must adhere to the platforms' payment processing services. This creates tremendous friction because it interjects the platforms between an app and its customers. Apps with digital goods cannot manage their own refund processes, nor can they customize their payment terms, nor can they add innovative features into the payment flow. For example, a dating app cannot run a sex offender check at the time of purchase because Apple manages the payment and refuses to share the transaction data with the developer.

Apple attempts to justify its behavior with claims that its restrictions are necessary for privacy and security. These arguments are a pretext to exert anti-competitive control over the access and distribution of applications on mobile devices, including extracting exorbitant and supracompetitive fees from businesses.

Instead of improving quality, these restrictions, and the attendant fee is simply an anticompetitive shackle on businesses and app developers that must rely on the app stores to reach consumers because comparable commercial payment processing costs range between 1.3% and 3.4% in other markets. For example, PayPal charges 2.9% which is **five to ten times less** than the rate charged by the platforms' app stores.[1]

➢ **Dominant digital platforms use their market power to disadvantage competing applications**

The House Subcommittee Report on Competition in Digital Markets revealed a prevailing fear among app developers that depend on dominant platforms like Apple. Many of these market participants expressed unease that the success of their small business and economic livelihood depend on the platforms "unaccountable and arbitrary power."[2]

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[1] *Issue: 30% App Tax on Creators and Consumers*, COALITION FOR APP FAIRNESS, "https://appfairness.org/issues/30-app-tax/ (last visited Apr. 16, 2021).

[2] Majority Staff of H. Subcomm. on Antitrust, Commercial and Administrative Law of the H. Comm. on the Judiciary, 116th Cong., Investigation of Competition in Digital Markets 18-19 (2020).

Beyond this, Apple uses its control over its operating system to advantage its own competing products by pre-installing applications by default or by arbitrarily disrupting distribution performance, pricing, and functionality of disfavored third-party apps.[3] This abuse of app store dominance has real, harmful effects on app developers who are wholly reliant on the platforms' app stores to reach consumers.

These pre-installation practices by Apple also have adverse effects on consumer experience. For example, when Apple purged its App Store of parental control apps developed by other businesses and replaced it with its own app, Screen Time, the company received hundreds of complaints that the app was worse than the apps that were removed.

➢ **Congress must act to curb the market power abuses of dominant digital platforms**

For too long these dominant digital platforms have abused their outsized power with little to no accountability at the expense of American businesses and consumers. A 2020 survey of consumers revealed that most are deeply concerned about the influence of dominant tech companies. There is bipartisan agreement that pushing for stricter legislation could lead to stronger antitrust enforcement, resulting in improved services and products for consumers.

Some of Apple's practices will likely be found illegal under the current antitrust laws after years of litigation, but the damage from these abusive practices is in progress now. The market is broken and needs legislation to provide immediate relief and clarity. Congress can and should act to increase competition for third-party payment processing, prohibit self-preferencing practices by the platforms, ban retaliation against app developers, and deter platforms from engaging in anticompetitive conduct.

Specifically, new laws could open competition for payment processing by prohibiting contract terms that enable platforms to require exclusive use of their payment systems. This would mean app developers could choose a payment system tailored to their business needs and would no longer be burdened by the excessive fees accompanying platforms' IAP solutions. New legislation would not prevent app developers from using a platform's payment system if they felt it was a superior product. If an app developer would like to continue using the platform's system, they should be allowed to do so. It would simply allow for freedom of choice.

This type of legislation would significantly diminish the power exercised by dominant digital platforms over how apps are distributed to millions of smartphones in the United States. By prohibiting these exclusive contract terms, app developers would be free to choose their preferred payment system. This would invite competition, likely lowering the fees paid for payment processing. This would stimulate innovation in payment processing technology. Moreover, the cost savings from lower payment processing fees would allow businesses to invest in new features which would benefit consumers and competition.

Additionally, new laws should prevent platforms from self-preferencing practices, such as the pre-installation of apps, preferential ranking, and reserving key device functionality to their own

[3] *Id.*, 14.

apps while denying it to competitors. Legislation preventing platforms from self-preferencing their own apps would remove the conflict of interest that has long defined the platforms' relationship with rival developers. It would ensure interoperability and fair access to key programming interfaces. As a result, apps created by a platform would no longer enjoy an unfair advantage over those of independent app developers.

Any new legislation should also prevent platforms from punishing app businesses if they forgo the platforms' restrictive IAP solutions through their app stores. Legislation that would implement an anti-retaliation regime would ensure that app developers truly have the freedom to use other payment systems of their choice in favor of restrictive IAP solutions, without fearing punishment or removal from platforms. Accordingly, app developers would be able to conduct their day-to-day business operations without fearing interference or interruption from the dominant platforms.

Finally, any new legislation should borrow the wisdom of the existing antitrust laws and allow for a private right of action with treble damages for businesses who have been harmed by dominant platforms. This is crucial to real-world deterrence, so platforms do not feel that the risk of being caught is less than the benefit from abusing the market. This will help to deter dominant platforms from engaging in anticompetitive business practices in the first place.

These are common sense reforms that are urgently needed. As it stands, the digital economy of the United States is dominated by a few major platforms. We urge the members of this committee to take the needed action to restore competition and protect the vibrancy of these markets in the years to come.

Executive Director
Coalition for App Fairness

April 20, 2021

The Honorable Amy Klobuchar
Chairwoman
Senate Committee on the Judiciary
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Washington, District of Columbia 20510

The Honorable Mike Lee
Ranking Member
Senate Committee on the Judiciary
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Washington, District of Columbia 20510

Antitrust Applied: Examining Competition in the App Stores

Dear Chairwoman Klobuchar, Ranking Member Lee, and Members of the Subcommittee,

We applaud this Subcommittee for its examination of the competitive dynamics of tech-driven markets, including app stores, with tomorrow's hearing, "Antitrust Applied: Examining Competition in App Stores." ACT | The App Association (the App Association) is the leading trade group representing small mobile software and connected device companies in the app economy, a $1.7 trillion ecosystem led by U.S. companies and employing 108,260 in Minnesota and 65,520 in Utah alone.[1] Our member companies create the software that brings your smart devices to life. They also make the connected devices that are revolutionizing healthcare, education, public safety, and virtually all industry verticals. They propel the data-driven evolution of these industries and compete with each other and larger firms in a variety of ways, including on privacy and security protections.

The witnesses in this hearing underscore highly publicized conflicts between large companies and software platforms (the app store / operating system combinations that facilitate app company-consumer transactions). However, while our member companies are always pushing software platforms to provide more value for the amounts they pay for developer services, they are concerned about how government intervention to solve disputes between well-resourced firms and software platforms will affect them. We appreciate that showcasing the breadth of views on app store competition presents challenges. However, the cross-section of issues these witnesses highlight provides only a narrow sliver of how competition is working in app store markets. To the extent that advocates are using perceived unfair treatment of multibillion-dollar firms like Spotify as evidence to support an expansion of antitrust law to protect non-platforms, our member companies have concerns and urge you to consider the impacts of such intervention on their businesses, the value they get from developer services, and their clients and consumers.

I. Competition is Alive and Well in the Markets Relevant to App Stores

The consumer-facing side of the market. Some commenters have argued that the major app stores do not compete with each other for consumers.[2] According to the proposed logic, the App Store does not compete with the Google Play store because an Apple customer cannot immediately access the Google Play store and vice versa.[3] However, dynamics like this do not insulate market actors like app stores from competition. For example, consider local markets for discount retail clubs or other services that require memberships. Costco members cannot

[1] ACT | THE APP ASSOCIATION, STATE OF THE U.S. APP ECONOMY: 2020 (7th Ed.), *available at* https://actonline.org/wp-content/uploads/2020-App-economy-Report.pdf.
[2] *See id.* at 95.
[3] *Id.*

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immediately access Sam's Club and vice versa (unless a consumer is a member of both simultaneously). A membership is generally required before you can begin using the services of either store, so there are some time and resource commitments that need to be made before you can switch. Similarly, an Apple iPhone owner must spend the time and resources to trade in their device for another smartphone that runs on Android instead, in order to access the Google Play store. These are properly viewed as switching costs—which are prevalent in markets where network effects are present—but these costs alone hardly justify a conclusion that the competitors in that market "do not compete against one another."[4] Critics cite logistical difficulties in switching, but in reality, switching is straightforward and assisted by the app store operators themselves.[5] In fact, a recent report indicates that it generally costs just $16 to switch from an iPhone to a Samsung device and $40 to switch from a Samsung device to an iPhone, including opportunity cost of time spent on switching.[6] Not only that, but it is also fairly common for someone to have a tablet that runs on Android and a smartphone that runs on iOS, or vice versa. Ultimately, these consumers are likely making their choices based on a combination of the app store offerings, operating systems, device features, and default apps on smart devices. That there are switching costs involved with leaving one app marketplace for another is simply not evidence that they do not compete with each other for consumers.

The developer services side of the market. The Google Play store and the App Store compete vigorously in the other side of the market, for developers and developer services. Google benefits a great deal from attracting the next great app and so does Apple[7] and the investments these platforms make to attract developers reflect this.[8] Moreover, Google and Apple have a history of trying to outdo one another with respect to the offerings they provide for developers. As "shopper's guides" to the two main app stores describe, the App Store and Google Play store respond to each other's offerings, vying to be the platform that provides better toolkits, APIs, and, of course, quicker (yet rigorous) app review processes.[9] In fact, over their respective lifespans, the

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[4] *See, e.g.*, Wing Man Wynne Lam, "Switching Costs in Two-Sided Markets," TOULOUSE SCHOOL OF ECON., Working Paper (Aug. 2014), *available at* http://publications.ut-capitole.fr/16551/1/wp_tse_517.pdf (examining the characteristics of competition between app stores for consumers, including the impacts on competition and consumer benefits when app stores adjust their various offerings).

[5] Avery Hartmans, "Here's the best and easiest way to switch from an Android device to an iPhone," Business Insider, (May 21, 2019), *available at* https://www.businessinsider.com/switching-from-android-to-iphone-how-to-2018-5#step-1-back-up-all-your-data-1.

[6] ELLIOTT LONG, WHY USERS AREN'T LOCKED INTO THEIR SMARTPHONE BRAND, PROGRESSIVE POLICY INSTITUTE (Apr. 8, 2021), *available at* https://eadn-wc05-3904069.nxedge.io/cdn/wp-content/uploads/2021/04/Why-Users-Arent-Locked-Into-Their-Smartphone-Brand4.8.21.pdf.

[7] *Ohio et al. v. Am. Express et al.*, 585 U.S. __ (2018) ("Unlike traditional markets, two-sided platforms exhibit "indirect network effects," which exist where the value of the platform to one group depends on how many members of another group participate.").

[8] Opposition brief of Apple Inc., *Epic Games, Inc. v. Apple Inc.*, Case No. 4:20-cv-05640-YGR, at 5 (N.D. Cal. 2020), *available at* https://www.courtlistener.com/recap/gov.uscourts.cand.364265/gov.uscourts.cand.364265.73.0.pdf ("In the interest of stoking more creativity, and to bring more apps to its users, Apple supports developers in a variety of ways, investing billions in tools that simplify the development process, across Apple's iOS.").

[9] *See* Yana Poluliakh and Victor Osadchiy, "What to expect from the App Store and the Google Play Store When you Launch Your First App," YALANTIS, *available at* https://yalantis.com/blog/apple-app-store-and-google-play-store/; Nikita, "Apple App Store vs. Google Play Store: A Comparison," 21 TWELVE INTERACTIVE, Blog (Sept. 20, 2019), *available at* https://www.21twelveinteractive.com/apple-app-store-vs-google-play-store-a-comparison/; Priya Viswanathan, "iOS App Store vs. Google Play Store," LIFEWIRE (Mar. 9, 2020), *available at* https://www.lifewire.com/ios-app-store-vs-google-play-store-for-app-developers-2373130.

major app stores have demonstrated a clear track record of competing with each other for developers, as our recent report details.[10] Lastly, the analysis of the relevant developer-facing side of the market does not end with whether there is competition between those two app stores, as there are other software distribution options that can serve as alternatives: smart TV app stores, gaming console app stores, and even video conferencing platforms[11] (a development accelerated by the pandemic). The open internet can also be a workable alternative for developers and consumers to the two major app stores (especially for larger developers with an established customer base or market share).[12] And for consumers who favor less data-intensive apps (for example, because they have limited data plans) or want to access certain apps across devices and browsers, progressive web apps[13] are a means of accessing mobile content and services outside the major app stores. As described above, however, there is plenty of evidence that the general-purpose app stores do compete with each other both for consumers and for developers. And if they are competing, that means the app stores are a) driving better services and offerings for developers, while b) pushing each other to provide the most attractive, diverse, and safe marketplace for consumers. And consumers currently benefit from differentiated products, as the App Store provides a more "premium" offering with tighter privacy and security controls, while the Google Play store boasts a greater variety.

Platforms have helped create or expand markets like digital health services. Just as ridesharing fundamentally changed how we get around, developers and platforms also revolutionized how we access healthcare. Digital health capabilities are maturing at a critical time when the pandemic has forced American patients to rely on virtual visits and remote monitoring. Secure smart devices and the software platforms that animate them are foundational elements to our current ability to manage healthcare wherever we happen to be. But this would not be possible if not for software platforms performing a gating function and securing operating systems and app stores from fraudulent apps and other threats to healthcare data. Those functions make smart devices worthy of the trust we must place in them to keep sensitive health data or conduct virtual physician visits on them.

There is reason to believe digital health will continue to play a central role in care delivery in the United states. A current shortage of about 30,000 physicians in the United States—projected to increase to up to 90,000 in the next five years[14]—contributed to the need for caregivers and

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[10] ACT | The App Association, A Brief History of Time: The App Stores (Apr. 7, 2021), *available at* https://actonline.org/wp-content/uploads/A-Brief-History-of-Time-The-App-Stores.pdf.
[11] *See* Vishal Mathur, "Apple's Response Proves App Store Isn't Any More a Monopoly Than the Google Play Store," NEWS18 (May 30, 2019), *available at* https://www.news18.com/news/tech/apples-response-proves-app-store-isnt-any-more-a-monopoly-than-the-google-play-store-2164875.html; David Pierce, "Zoom has a plan to dominate the virtual events industry," PROTOCOL (Oct. 14, 2020), *available at* https://www.protocol.com/onzoom-virtual-events (describing Zoom's new Zapps app store).
[12] Online Platforms and Market Power, Part 2: Innovation and Entrepreneurship, hearing before the House Judiciary Committee, Subcommittee on Antitrust, Commercial, and Administrative Law (statement of Morgan Reed, President, ACT | The App Association) 7 (Jul. 17, 2019), *available at* https://actonline.org/wp-content/uploads/Online-Platforms-and-Market-Power-Part-2-Innovation-and-Entrepreneurship-1.pdf.
[13] Sam Richard and Pete LePage, "What are Progressive Web Apps?" WEB.DEV (Feb. 24, 2020), *available at* https://web.dev/what-are-pwas/.
[14] *See* Connected Health Initiative, "Testimony of Morgan Reed, Executive Director, The Connected Health Initiative, Before the U.S. Senate Committee on Health, Education, Labor, and Pensions (HELP) Subcommittee on Primary Health and Retirement Security," (Sept. 25, 2018), *available at* https://actonline.org/wp-content/uploads/CHI-Testimony-Health-Care-in-Rural-America.pdf.

patients to find new ways of communicating. Compounding the caregiver shortage, 133 million Americans currently live with chronic conditions—most of them residing in rural areas with long drives to their nearest provider.[15] Devices, sensors, and software are now capable of gathering and analyzing physiological data like movement, heart rate, electrocardiogram, or pulse oximetry so that physicians can better monitor their patients at home and address potential problems before they occur or worsen.[16] Studies show that preventive care regimes that use connected health tools are especially useful for patients with chronic conditions like diabetes and heart failure, which tend to affect underserved and rural communities in particular.[17] But how do these capabilities reach patients and consumers, specifically those who need them most? Most Americans already interact with platforms, through a variety of devices. We know that smartphone adoption rates are increasing among underserved populations in the United States and that for many, their handheld device is their only means of accessing the internet.[18] Here again, developers are leveraging the ubiquity and trusted framework of platforms to produce healthcare innovations that address a variety of health conditions. Moreover, in this case, the platform-developer dynamic helps caregivers reach patients in rural and underserved areas.

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[15] *See Id.*

[16] *Id.*

[17] *See, e.g.,* Clinical Outcomes, Care innovations, at 2, available at http://www.connectwithcare.org/wp-content/uploads/2017/06/2016_Outcomes_Clinical-1.pdf (showing the results of a study by Care innovations and University of Mississippi Medical Center, indicating that the first 100 patients with diabetes enrolled in a program with a remote monitoring component saved the state $336,184 in Medicaid dollars over six months); Testimony of Michael P. Adcock, Exec. Dir., University of Mississippi Med. Ctr., Hearing on "Telemedicine in the VA: Leveraging Technology to Increase Access, Improve Health Outcomes & Lower Costs," (May 4, 2017), available at https://www.appropriations.senate.gov/imo/media/doc/050417-Adcock-Testimony.pdf ("The Mississippi Division of Medicaid extrapolated this data to show potential savings of over $180 million per year if 20 percent of the diabetics on Mississippi Medicaid participated in this program").

[18] Charkarra Anderson-Lewis, MPH, PhD, et al, "mHealth Technology Use and Implications in Historically Underserved and Minority Populations in the United States: Systematic Literature Review," (Jun. 18, 2018), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6028762/.

II. Developers are Pushing for More from the Platforms

Software platforms have historically responded to the needs of developers and consumer demands as those forces have evolved. Right now, app companies are pushing for several things from software platforms that government intervention would likely undermine. Specifically, app companies are seeking:

1. Expedient removal of scam apps, fake reviews, and fraudulent actors. Scam and fraud apps have slipped through the review and removal cracks,[19] and our member companies are concerned about these incidents. We strongly disagree, however, with suggestions that software platforms should give up on the exclusive app store model. The fact that app stores have such a high volume of apps to review, posing security review difficulties, is cited as a reason for steamrolling Apple's closed App Store system with a government prohibition on app store exclusivity. If our member companies choose to distribute through the App Store, they expect tough security reviews and fast removal of bad actors. A complete removal of the gatekeeping function would accomplish the exact opposite.

2. Better security. App companies depend on software platforms to provide a trusted marketplace. Software platforms ensure security by both reviewing proposed apps and by pushing out security updates for a device operating systems. These functions are exceptionally important for a trusted marketplace, and investment should reflect this importance.

3. Better privacy. App companies compete on privacy. They are working hard to produce tech-driven privacy features that address evolving consumer expectations and technical realities, and some of them provide products and services focused solely on privacy protections.[20] The privacy functions of software platforms, however, are also critical to foster a trusted ecosystem in which to operate.

4. More investment in developer relations. Software platforms have significantly lowered barriers to entry for software sellers. But the app stores can seem vast and impersonal for the smallest app companies, and rejections or other adverse decisions can seem impossible to surmount without proper explanations or personal interactions with software platform staff. A lack of personal attention can lead to dissatisfaction and resentment, so it is in software platforms' best interests to help developers find success on the platform. Conversely, individual attention for the smallest app companies helps nurture the truly robust app marketplace where the best ideas flourish from the most surprising corners—and that is what consumers, software platforms, and app companies alike want most.

Subjecting software platforms to substantially heightened antitrust liability for managing app stores to better protect privacy, security, remove fraudulent actors, and provide individual services would undermine everything our member companies are asking for from software platforms. Similarly, creating nondiscrimination or other regulatory regimes specifically for current incumbents would inadvertently create a regulatory moat around them, protecting each from known competitive

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[19] Statement of Morgan Reed, president, ACT | The App Association (Feb. 11, 2021), *available at* https://actonline.org/statements/.

[20] *See, e.g.*, "The Rise of Privacy Tech Helps Privacy Tech Founders Solve Their Biggest Pain Points," TROPT (Jun. 5, 2020), *available at* https://www.riseofprivacytech.com/tropt-helps-privacy-tech-founders-solve-pain-points/.

pressures and from potentially unforeseen entrants providing increasingly analogous services like Square. Such protection removes their incentives to respond to developer demands, supplanting it with bureaucracy and lobbying battles.

II. Antitrust Intervention to Limit Software Platform Functions Would Harm Small App Companies

In the software platform context, policymakers are considering a variety of structural or quasi-structural remedies from a Glass-Steagall-like separation of lines of business to prohibitions on specific kinds of exclusivity. Mostly, concerns about the economic health of these markets animate legislative interest, but policymakers are also examining possible political motives behind app store decisions. Some of those inquiries are already leading to broad ideas of exposing software platforms to additional liability related to speech or other causes of action for trial attorneys.[21] Although lawmakers are raising these concerns against a backdrop of concentrated markets, expanding antitrust law is not the optimal path to address perceived political externalities arising from app store rejections. We agree that departing from the consumer welfare standard could "cripple our economy at a time when millions are already struggling . . . and . . . undermine one of the foundational principles of our republic."[22] The last thing our member companies want is for app store functions to get bogged down in decade-long antitrust litigation over what are essentially political disagreements.

Aside from these concerns, there is a fair amount of interest in examining the ability and "incentive to impede competition in lines of business dependent on" platforms.[23] This is a worthy line of inquiry with a framework that should respect the fact-driven analysis involved with identifying and stopping harms to competition and consumers. Accordingly, an important step in this process is to examine the benefits for smaller software competitors of ongoing and recent activities by software platforms that have drawn antitrust scrutiny in light of proposals to separate them from adjacent markets or restrict their functions as platforms. Those in favor of structural separation and other competition remedies in software markets seem to target two areas of perceived "gatekeeper" power: 1) control over the kinds of software that can be downloaded onto a device's operating system; and 2) control over the kinds of software that can be offered via an app store. These are important functions for our member companies, which caution against weakening them too much to benefit other competitors.

Prohibitions on exclusivity. Several state legislatures have considered or are actively considering proposals that would impose a quasi-structural restriction at the operating system level by prohibiting software platforms from acting as gatekeeper for software installed on a device.[24] Among other things, the bills bar operating systems from accepting software unless it is distributed exclusively through a certain app store marketplace and prohibit "retaliation" against software developers that circumvent approval through that distribution channel.[25] Although this may sound

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[21] Republican Leader McMorris Rodgers, Big Tech Accountability Platform, House Committee on Energy and Commerce, Memorandum (Apr. 15, 2021), *available at* https://republicans-energycommerce.house.gov/wp-content/uploads/2021/01/Big-Tech-Accountability-Platform-Memo.pdf.
[22] Press Release, "Sen. Lee Sets Senate Republican Antitrust Agenda for 117th Congress," Sen. Mike Lee (Feb. 6, 2021), *available at* https://www.lee.senate.gov/public/index.cfm/2021/2/sen-lee-sets-senate-republican-antitrust-agenda-for-117th-congress.
[23] ACAL Report at 35 (citing report accompanying Antitrust Reform Act of 1992).
[24] *See, e.g.*, SB 2333, 67th North Dakota General Assembly (2021), *available at* https://www.legis.nd.gov/assembly/67-2021/documents/21-1044-01000.pdf.
[25] *Id.*

like it lowers a barrier to entry by weakening the platforms' gatekeeper capabilities, it does the exact opposite and removes a steppingstone to the market. Moreover, the proposals' supporters are some of the largest companies on the app stores that openly seek to avoid their obligations to pay *at all* for the software platforms' developer service bundles.[26] The bundles include a wide variety of services for developers and, contrary to how some are characterizing them, are not just a "payment processing fee."[27] Specifically, those services include:

- Immediate distribution to hundreds of millions of consumers across the globe;
- Marketing through the platform;
- Accessibility features;
- Platform level privacy controls;
- Assistance with intellectual property (IP) protection;
- Security features built into the platform;
- Developer tools;
- Access to hundreds of thousands of application programming interfaces, or APIs; and
- Payment processing.

From these services, small app companies obtain easy access to a global market, the ability to offload overhead (like managing payment options and preventing piracy), but most importantly, they **can leverage consumer trust**. Consumer trust is fundamental for competitors in the app economy, especially for smaller firms that may not have substantial name recognition. Larger firms, meanwhile, may have the resources to put together the bundle of services and generate consumer trust in a known brand name all on their own. Therefore, they might think of the software platform bundle as less valuable to them than it is to smaller companies, which may help explain their calls for government intervention to diminish those services. They simply have less to lose and more to gain from such intervention than do App Association members and consumers.

The state bills reflect a view that takes for granted the platform functions necessary to fuel a trusted ecosystem that lives on our smart devices now. Consumers now depend on mobile devices to store their most important information, and the ability to protect that data is vital. Banning software platforms' gatekeeping function puts users' most vital data at risk. App Association member companies—much more so than the large companies selling software on the app stores—depend on strong privacy, security, and IP protections at the platform level. Therefore, proposals to require platforms to allow circumvention of these protections would harm consumers and app economy competitors alike. Platforms currently work to keep apps that violate user trust out of their stores.

In one example, some bad actors market their device-monitoring apps designed to track children's mobile device use as a way to track anyone, including adults, without their knowledge or permission. These "stalker apps" operate outside the bounds of what is allowable in app stores or mobile operating systems by accessing troves of personal data including location, messaging, and

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[26] Order Granting in Part and Denying in Part Motion for Preliminary Injunction, Epic Games v. Apple Inc., Case No. 4:20-cv-05640-YGR (N.D. Cal. Oct. 9, 2020) ("Epic Games moves this Court to allow it to access Apple's platform for free while it makes money on each purchase made on the same platform. While the Court anticipates experts will opine that Apple's 30 percent take is anti-competitive, the Court doubts that an expert would suggest a zero percent alternative. Not even Epic Games gives away its products for free.").

[27] The full set of developer services software platforms provide includes immediate distribution to tens of millions of consumers globally; marketing through the platform; platform level privacy controls; assistance with intellectual property protection; security features built into the platform; developer tools; access to hundreds of thousands of application programming interfaces, or APIs; and payment processing.

calls. In 2019, the Federal Trade Commission (FTC) pointed to the important function software platforms perform in its first ever action against a purveyor of stalker apps, Rentina-X. The FTC stated in its enforcement action that "the purchasers were required to bypass mobile device manufacturer restrictions, which the FTC alleges exposed the devices to security vulnerabilities and likely invalidated manufacturer warranties."[28] Similarly, as the FTC has investigated and enforced against consumer protection harms on the app stores, the contemplated—and actual—remedies required the platform to act as gatekeeper.[29] Consumer protection efforts encounter difficulty in these marketplaces unless a platform is able to enforce the requirements it imposes on apps, including platform-level controls that prevent videogame companies from taking advantage of children's tendencies toward in-app purchasing if left unchecked.

Limitations on exclusionary conduct. To ameliorate perceived issues with self-preferencing on software platforms, policymakers are considering amendments to antitrust law that fall somewhat short of a set of nondiscrimination rules but expand liability for categories of exclusionary conduct. Again, pointing to the "incentive and ability to abuse"[30] their dominant position against third parties, policymakers are considering an "abuse of dominance" standard applied to software platforms (and generally).

Setting aside the particulars of existing proposals, we urge this Subcommittee to consider a couple of factors when contemplating such an expansion of liability. First, many of the actions of software platforms that have drawn antitrust criticism also have countervailing benefits. For example, Apple's decision to require opt-in consent for ad tracking between apps caught attention in the antitrust space but has a powerful justification in privacy protection. In a stark example of privacy versus antitrust interests, the French Competition Authority recently rejected a competition complaint to enjoin Apple's opt-in framework, noting that it is part of "Apple's long-standing strategy to protect the privacy of iOS users."[31] Second, self-preferencing activities on software platforms that appear to harm some competitors often benefit others and consumers. For example, the installation of pre-loaded apps on smart devices can greatly benefit developers by enabling them to rely on a single default functionality like a camera app while making the device itself more attractive to the consumers App Association members wish to reach. Said Parag Shah of App Association member company Vēmos in a recent antitrust panel discussion, consumers "want to be able to buy [a smart device] from a store, they want to be able to turn it on, and they want it to work on the basic levels of 'I can text someone, I can call someone, I can open up a web browser . . . I want some basic functionality.'" In this case, although the pre-installation of apps plainly advantages a software platform's own offerings over alternative camera, messaging, or browser apps, the benefits to consumers and other competitors of doing so are equally evident. The considerations here weigh against tilting liability for exclusionary conduct too far such that

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[28] Press Release, Fed. Trade Comm'n, FTC Brings First Case Against Developers of "Stalking" Apps (Oct. 22, 2019), *available at* https://www.ftc.gov/news-events/press-releases/2019/10/ftc-brings-first-case-against-developers-stalking-apps.

[29] Press Release, "Apple Inc. Will Provide Full Consumer Refunds of At Least $32.5 Million to Settle FTC Complaint It Charged for Kids' In-App Purchases Without Parental Consent," Fed. Trade Comm'n (Jan. 15, 2014), *available at* https://www.ftc.gov/news-events/press-releases/2014/01/apple-inc-will-provide-full-consumer-refunds-least-325-million.

[30] ACAL Report.

[31] Press Release, "Targeted advertising / Apple's implementation of the ATT framework. The Autorité does not issue urgent interim measures against Apple but continues to investigate into the merits of the case," Autorité de la concurrence (Mar. 17, 2021), *available at* https://www.autoritedelaconcurrence.fr/en/press-release/targeted-advertising-apples-implementation-att-framework-autorite-does-not-issue.

conduct that appears to harm a certain class or classes of competitors is foreclosed or strongly discouraged, even though it is ultimately better for App Association members, competition, and consumers.

III. More Resources and Enforcement in Standards-Setting

We support recommendations to "[i]ncreas[e] the budgets of the Federal Trade Commission and the Antitrust Division."[32] Antitrust cases are a highly resource-intensive undertaking, and federal enforcers are underequipped to carry out their important task.

One area we urge the Subcommittee to focus on in particular, and where the federal enforcement agencies must bring those resources to bear, is the applicability of antitrust law to standard-essential patent (SEP) abuse. In your respective states and districts, the ability for innovators to create jobs and produce cutting-edge products and services in an increasingly broad set of industry verticals depends on strong technical standards like USB, Wi-Fi, 4G, and 5G. However, in order to safeguard the continued growth and success of these key industries and to protect the consumers of their end products and services, Congress must ensure that antitrust law effectively prevents SEP licensing abuses. Incorporating a patent declared as essential into a standard typically confers market power on a SEP owner, so SEP owners make voluntary commitments pursuant to those declarations to license those SEPs on fair, reasonable, and nondiscriminatory (FRAND) terms.[33] These commitments balance the market power SEP owners obtain with the need for innovators to license the patented inventions essential to use the standard. When kept, FRAND commitments prevent anticompetitive licensing behavior by curtailing, in most cases, the ability of an SEP licensor to leverage its market power through exclusionary relief; by rewarding an SEP owner with damages for infringement of a valid patent that are commensurate with the scope of its patented invention; and by ensuring that an SEP licensor cannot discriminate between firms in the manufacturing supply chain when licensing its SEPs. The SEP context is distinct from situations where companies own unencumbered patents or are competing with each other to provide the best vertically integrated product or service. Through standards-setting, stakeholders supplant part of the competitive process with a mechanism for interoperability, necessitating closer antitrust involvement. Unfortunately, some SEP owners break their FRAND promises and engage in activities that harm competition and consumers by increasing prices, reducing the quality and variety of products and services, and diminishing innovation.[34] Breaking these promises implicates antitrust law, in addition to other sources of law.

Conclusion

As this Subcommittee continues its work on antitrust in tech-driven markets, we hope the perspective of small mobile software and connected device companies that leverage software platforms helps guide your work. Antitrust is rightfully a fact-intensive inquiry that must assure the competitive process serves consumers as well as possible. To that end, we support providing more resources for the two federal agencies tasked with enforcing antitrust law—they are woefully

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[32] ACAL Report, at 403.
[33] *See* Brian T. Yeh, "Availability of Injunctive Relief for Standard-Essential Patent Holders," CONG. RESEARCH SERV. Summary (Sept. 7, 2012), *available at* https://www.everycrsreport.com/files/20120907_R42705_9c71ac36b1c0030af0d1bd97b53e8b7ba6fd3e73.pdf.
[34] *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297, 318 (3d Cir. 2007), *available at* https://caselaw.findlaw.com/us-3rd-circuit/1069408.html.

under-resourced to carry out the important and extremely costly task of stopping antitrust harms. In general, our member companies are worried that large, well-resourced companies may successfully create for themselves a new avenue for bending the market in their favor by reorienting antitrust law so that it protects certain (large, well-resourced) competitors to the detriment of smaller companies and consumers. We appreciate this opportunity to weigh in on your important inquiry and look forward to further engagement with you throughout the 117th Congress and beyond.

Sincerely,

Morgan W. Reed
President
ACT | The App Association

Public Knowledge

April 21, 2021

Senator Amy Klobuchar
Chairwoman
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
425 Dirksen Senate Building
Washington, DC 20510

Senator Mike Lee
Ranking Member
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
361A Russell Senate Office Building
Washington, DC 20510

Dear Chairwoman Klobuchar and Ranking Member Lee,

Public Knowledge commends the Subcommittee for holding this hearing on the competition problems presented by app stores and is pleased to offer its expertise as you consider potential reforms and solutions. As a consumer advocacy organization, we urge the Subcommittee to not forget consumers in what can many times devolve into a business versus business debate.

App stores have made it easy for users to find and install software, and the security features of modern mobile devices protect users from many harms. We do not discount these consumer benefits. However, left unregulated, dominant app stores can wield the same gatekeeper power threatening consumers in other digital industries such as social media and search. App store practices from dominant platforms such as Apple and Google warrant heightened scrutiny.

There are safeguards that should be in place for phone capabilities and categories of apps that can be harmful or misused, such as always-on location tracking, device management, "stalkerware," and other apps that pose a security or privacy threat to consumers. However, this should not prevent us from introducing more competition both *against* and *on* the dominant app stores. Nor do these concerns justify app stores taking advantage of their position to require that apps use particular in-app purchase systems for digital goods and services, or other business model restrictions.

It is not even clear that Apple and Google are living up to the promises they make with respect to app stores. Their stores are rife with scams and rip-off apps, exploiting consumers by taking their money to benefit unscrupulous app developers and the platforms themselves. Many of these problems only came about because app stores pushed developers into business models based on subscriptions and in-app purchases, or based on ads and tracking that violate user privacy.

Public Knowledge supports a strong non-discrimination rule for platforms so that they cannot favor their own offerings. This rule is particularly relevant to app stores and mobile devices, which have become so central to our lives and the economy. We believe that third-party competitors should be treated the same as the platforms themselves unless there is a compelling reason otherwise. Discrimination can be thorough unfair fees, such as music streaming competitors (*i.e.*, Spotify) being forced to pay a 30% commission to Apple while Apple's own offering (Apple Music) faces no such obstacle. However, the issue can also be technical, such as

Apple granting itself access to location services and near-field communications technology it does not grant to third-party competitors.

App stores also present free expression problems. At a high level, it is not objectionable for app stores to offer a curated experience. However, this should not stand in the way of users accessing the lawful software and content of their choice *outside* the app store. With the Mac, Apple itself has shown that it is possible to "sandbox" apps and protect user privacy without requiring that all apps come through a single app store. Additionally, the chokepoint that app stores create provides a tempting target for authoritarian governments around the world. When governments require that platforms take certain apps down from their app stores, users should have alternatives.

A detailed analysis of the app store market, as well as a menu of potential solutions, are presented in the attached paper from Public Knowledge Legal Director John Bergmayer, "Tending the Garden: How to Ensure App Stores Put Users First." We hope the paper will serve as a resource as your Subcommittee considers legislation and oversight to empower competition and consumers in app stores. Antitrust reform, such as that already proposed by the Chairwoman, would go a long way to combatting many of the competitive ills presented by app stores today. However, Public Knowledge also believes that additional laws and rules specific to platforms are needed as well.

Consumers, existing app businesses, and future entrepreneurs will benefit from fair competition on app stores, fair access to device features, and free expression safeguards. Public Knowledge hopes this hearing is just the beginning of Congress exercising its proper role in safeguarding and promoting competition in digital markets.

We look forward to continue working with you,

/s/ John Bergmayer
John Bergmayer
Legal Director
Public Knowledge

/s/ Charlotte Slaiman
Charlotte Slaiman
Competition Policy Director
Public Knowledge

/s/ Alex Petros
Alex Petros
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Public Knowledge

PUBLIC KNOWLEDGE

Tending the Garden:

How to Ensure That App Stores Put Users First

June 2020

John Bergmayer

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Executive Summary

App stores provide security, privacy, and trust for users, while giving platform maintainers significant gatekeeper control over the software that users can access, what that software can do, and how it can be monetized. This gatekeeper control can be used to benefit platforms at the expense of independent software developers as well as users. Switching costs, network effects, and other factors mean that competition between platforms for users and developers cannot be enough to ensure that app stores and their associated software platforms will be operated in a way that promotes consumer rights, the public interest, and broader economic benefits. This paper suggests specific measures that should be implemented by dominant app stores to promote these interests—reducing the gatekeeper control that app stores inherently have, but not eliminating it. These measures are suggested as baseline structural remedies that would apply broadly, and do not fully displace the need for a competition law framework, an individualized, complaint-driven procedure that addresses matters these measures do not address, or other remedies.

Specifically, this paper recommends that platforms allow users and developers to bypass the app store entirely through side-loading, but only subject to strict code-signing requirements. Code-signing ensures that only software from known developers can run on a device. At the same time, this paper suggests that code-signing authorities themselves can be decentralized. It also recommends a few measures that app stores can implement to reduce the advantage their first-party apps have over competitors, such as allowing users to change defaults, and proactively providing third-party application programming interfaces, or APIs, for major new features at a more rapid cadence. This paper also calls for app stores to allow greater business model flexibility to developers, such as allowing things like paid upgrades and not requiring the use of in-app purchase systems for media purchases and subscriptions. It calls for due process for developers to ensure consistency in the application of rules. Finally, even older versions of dominant platforms and software that run on them can be of historical and technological interest. Platforms should, therefore, ensure that it remains possible to archive and emulate software that may still be protected by copyright but is of limited commercial significance.

These measures are not costless to implement. Dominant platform maintainers (the companies that operate the app stores and their associated software platforms) would have to spend time and money, hire extra staff, and add more internal processes to carry them out. This give-and-take is how the nature of regulation of private enterprises "of public consequence" necessarily works.[1]

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[1] *See Munn v. Illinois*, 94 U.S. 113 (1876) ("Property does become clothed with a public interest when used in a manner to make it of public consequence, and affect the community at large. When,

App stores that follow these practices can still be successful, self-funding business endeavors—that is, not merely operated as a loss leader for hardware sales or service upselling. Indeed, the broader positive economic effects promoted by these measures may indirectly benefit the platforms as well. In this paper's final analysis, even the recommendations aimed at benefitting developers should be considered consumer protection measures, as the aim of this paper is to advocate that users have more control, more ability to access content, and access to a more competitive software market than an unregulated, dominant software platform is likely to provide absent intervention.

Introduction

App stores—along with broadband internet access, cloud services, and the like—are part of the infrastructure of the internet and of the digital economy. Much of how people now engage in commerce, look up information, communicate with family and friends, find dates, work, and entertain themselves is mediated through apps. While apps and app stores exist on various computing platforms—smart TVs, desktop PCs, and game consoles, for instance—they are of central importance to smartphones and tablets. Due to platform design decisions as well as technological constraints, functions that could be done via a web browser on the relatively uncontrolled open web on a desktop PC or a laptop, often must be mediated through an app on mobile devices. This is not necessarily a bad thing—so-called "native" apps can offer features, performance, and security unavailable to web apps—but it brings into focus the power that app stores, the software platforms they run on, and the companies that control them (platform maintainers), have over the lives and activities of users, and the livelihoods of the developers who need access to app stores to reach users. (This paper uses the term "platform maintainer" rather than "platform owner" or some other term to avoid suggesting that the company that develops the platform owns or should be credited with the economic and social value of a platform. Users and third-party developers are equally, if not more responsible; the world's greatest operating system, app store, and devices are nothing without them.)

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therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good, to the extent of the interest he has thus created.") To be as clear as possible: the regulation of dominant platforms does not imply that platforms are somehow at "fault" for being dominant. It is not punishment, it is not a question of "fairness," and regulation of this kind does not have to be justified in terms of antitrust or other forms of competition law. It is a response to their importance to the public interest and the economy, an importance their smaller rivals may lack, which justifies imposing extra regulatory requirements on dominant platforms and dominant platforms alone. One consequence of this is that smaller rivals may be permitted to engage in activities that dominant platforms cannot. If the consequence of this is that smaller rivals gain a relative advantage, then this is a pro-competitive side effect of regulation, but not the intended consequence.

Broadly defined, the "app economy" has been variously estimated to be worth $950 billion (as of 2018, domestically),[2] $6.3 trillion (globally, by 2021),[3] and $568 billion.[4] These different numbers include different things—direct app sales and in-app purchases, purchases of physical and in-person goods and services through apps, the value of advertising, the value of devices controlled through apps, the jobs directly created by apps, and the economic ripple effects created by all these things. For this paper, it is enough to say that the economic impact of app stores is large, and their role in the economy is important.

The same features that make app stores compelling for users and (at times) the developers of third-party apps also give the companies who run them an unprecedented level of control over both what users can do with their devices, and developer livelihoods. App stores are one component of software platforms,[5] particularly mobile software platforms, that have become essential infrastructure enabling commerce, communication, and culture. Dominant app stores and their associated software platforms deserve scrutiny because decisions taken by platform maintainers like Apple and Google can harm competition more broadly. Moreover, absent some intervention, these platform maintainers may not have the incentive to invest in areas of the platform that create positive externalities that ripple through the economy, but that they cannot directly capture. Whatever the estimate of the "app economy" you pick, platform maintainers shouldn't capture that full value for themselves. (Similarly, broadband providers shouldn't try to capture the full value of commerce their infrastructure enables, and the maintainers of toll roads do not deserve a percentage of the profits or salary of the people who drive on their roads.)

This paper's recommendations are meant to benefit users and independent developers directly. Another way of looking at them, however, is as designed to ensure that platform maintainers operate in a way that maximizes the overall positive economic effects of app stores. This is why this paper is concerned with "dominant" app stores—they are the ones that, due to their popularity or the markets they serve, have wide-ranging economic effects, and affect the most users.

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[2] The App Association, *State of the App Economy (6th Ed.)*, (2018), https://actonline.org/wp-content/uploads/ACT_2018-State-of-the-App-Economy-Report_4.pdf.
[3] App Annie, *The State of Mobile 2020*, (January 15, 2020), https://www.appannie.com/en/go/state-of-mobile-2020; *see also* Sarah Perez, *App Economy to Grow to $6.3 Trillion in 2021*, TECHCRUNCH (June 27, 2017), https://techcrunch.com/2017/06/27/app-economy-to-grow-to-6-3-trillion-in-2021-user-base-to-nearly-double-to-6-3-billion.
[4] Deloitte, *The App Economy in the United States*, (August 20, 2018), https://www.ftc.gov/system/files/documents/public_comments/2018/08/ftc-2018-0048-d-0121-155299.pdf.
[5] Some of the recommendations of this paper directly concern app store policies, such as the kinds of apps allowed in the store, what those apps can do, and how they can be sold. Others may require changes to the underlying software platform itself as a prerequisite before such apps can be carried in the store, or even relate to integration with specific hardware features.

The recommendations of this paper are not all costless for platform maintainers to implement. Some may require hiring extra staff, taking more time to roll out features, or even signaling to the marketplace planned changes. They may interfere with monetization opportunities or make it more difficult for a platform maintainer to enter new lines of business while opening opportunities for smaller competitors who do. (They are, however, designed to preserve the main security benefits of modern secure computing platforms.) Nevertheless, the broader social and economic effects of following these recommendations for dominant platforms suggests they're worth it. The public benefits outweigh the private costs, without making app stores unprofitable to operate.

While this paper does not dwell on whether platform maintainers should voluntarily follow these practices or somehow be required to, Public Knowledge has extensively argued for a digital platform regulator that would have the legal authority to require that platforms adopt specific policies,[6] as well as enact structural changes to platform marketplaces as a whole. It is also worth briefly mentioning the connection of these issues to antitrust, especially given heightened attention to Apple's highly restrictive policies around in-app purchases, which will be discussed at length below. The EU has opened an investigation into Apple's practices in this area,[7] and Representative Cicilline, Chairman of the House Subcommittee on Antitrust, which is currently investigating tech industry practices generally, has called Apple's practices "highway robbery."[8] The question of antitrust is therefore unavoidable, and in many areas, there seems to be a strong *prima facie* antitrust case that specific actions by Apple or Google in terms of how they manage their platforms are unlawful. Nevertheless, antitrust is unlikely to be the best tool to bring about most of these paper's recommendations. First, antitrust is often narrowly focused on specific anticompetitive actions, as opposed to market structure and incentives. In the case of private antitrust suits, any relief might be targeted just to one company, and any policy changes that result might only affect that company, or companies in an identical situation. Second, many of the harms this paper seeks to address—for example, issues around free expression and cultural archiving—are simply not competition harms that can be addressed by antitrust at all. Still, antitrust investigations by public authorities are likely to bring to light facts about the marketplace, differential treatment given to some developers, and other matters that could be generally informative to regulatory and policy efforts of all kinds. Further, need for a comprehensive, regulatory approach should not dissuade litigants from bringing cases where the facts merit it.

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[6] Harold Feld, THE CASE FOR THE DIGITAL PLATFORM ACT, (May 2019), https://www.publicknowledge.org/assets/uploads/documents/Case_for_the_Digital_Platform_Act_Harold_Feld_2019.pdf

[7] European Commission, *Antitrust: Commission Opens Investigations Into Apple's App Store Rules*, Press Release (June 16, 2020), https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1073.

[8] Nilay Patel, *Apple's App Store Fees Are 'Highway Robbery,' Says House Antitrust Committee Chair*, THE VERGE (June 18, 2020), https://www.theverge.com/2020/6/18/21295778/apple-app-store-hey-email-fees-policies-antitrust-wwdc-2020.

Thus, the best way to contextualize this paper's recommendations is as the specific requirements sector-specific platform regulator, applicable to platform maintainers that operate dominant app stores. That said, smaller platforms should feel free to follow them if they so choose—all of the recommendations, in the end, benefit users (users, of course, are the ultimate beneficiaries even of pro-developer changes). Additionally, it may be that specific recommendations are closer to baseline consumer protection measures that every platform maintainer, however small, should follow.[9]

While theoretical considerations of this kind motivate this paper, its purpose is not to provide an economic, political, or legal theory of infrastructure, competition, or dominance. Rather, it is to address some of the technical details of app stores that platform maintainers—and potentially, regulators—may have to consider in this area. Its fundamental thesis is that app stores and controlled software platforms are in general beneficial, and that their benefits to user security and confidence should not be thrown out in favor of a vision of "openness" that, in practice, puts ordinary users at risk. Nevertheless, the loss of openness has downsides. The challenge then is to manage the disadvantages of greater control by the platform maintainer without creating problems for security or privacy (or even device stability, battery life, and performance). After discussing some of the techniques and policies that platform maintainers deploy to ensure control, this paper will review some of the problems that app stores can create before suggesting ways to address them.

* * *

App stores have empowered users by allowing them to confidently install software from a trusted source with the knowledge they can just as easily uninstall it, and that it won't damage their device. This is a significant improvement from the days when ordinary users had no way of knowing whether a given piece of software was a legitimate application or a data-harvesting, spam-sending piece of malware. Those experiences often resulted in users avoiding installing software on their computers altogether, or leaving it to experts to decide what was safe.

App stores have benefitted many developers, too, providing them with a large addressable market, a distribution and payments infrastructure, a community of developers, tools and documentation, and other services. They have given rise to the "app economy," and many successful and sustainable small businesses, as well as many headline-grabbing billion-dollar ones, would not have been possible without the reach and services that app stores provide.

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[9] While privacy rules are beyond the scope of this paper, they offer a good example of rules that digital services of all kind should be required to follow regardless of whether they are "dominant" in the marketplace. Rules against deceptive user interface techniques ("dark patterns") may be in the same category.

But app stores have well-known downsides. The very features that allow platform owners to protect their users also enable them to restrict developers. The processes designed to keep malicious apps off of the store can keep apps that pose a competitive threat to the platform owner off the store, as well. The same policy might protect user privacy and inhibit competition. It is not always clear at the outset whether it is possible to protect user privacy in ways that do not have competitive side-effects, or even how one is to compare harms to competition to offsetting, but incommensurable benefits.

Criticism of app stores has been ardent, but often contradictory, and often centers on whether the platform exercises too much control or not enough.

App stores have taken upon themselves the role of curating the material they carry. As a result, people blame them when bad stuff slips through, or argue that Apple or Google fails to adequately prevent harmful apps, or apps from businesses with harmful business models, from being listed in its app store. For the Washington Post, Geoffrey Fowler wrote, "You might assume you can count on Apple to sweat all the privacy details. After all, it touted in a recent ad, 'What happens on your iPhone stays on your iPhone.' My investigation suggests otherwise." His investigation showed that popular iOS apps, including "Microsoft OneDrive, Intuit's Mint, Nike, Spotify, The Washington Post and IBM's the Weather Channel" were sending personal data to the cloud. He called for Apple to do more to prevent apps on its store from doing these things, though stated that "The result shouldn't be to increase Apple's power."[10] Joanna Stern of the Wall Street Journal has also shown how popular apps, including kid's apps, have questionable privacy practices, writing that "My app-tracking adventures show that more transparency and stronger protections are needed."[11] Offering similar but more extensive criticisms, Ian Bogost has observed,

> Companies such as Google and Facebook get access to iPhone users by offering their apps—Messenger, Gmail, Google Maps, and so on—for download from the Apple App Store. Most cost consumers nothing, because they exist to trade software services, such as email or mapping, for data. That business model helped stimulate the data-privacy dystopia we now occupy.

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[10] Geoffrey A. Fowler, *It's the Middle of the Night. Do You Know Who Your iPhone is Talking To?*, WASHINGTON POST (May 28, 2019), https://www.washingtonpost.com/technology/2019/05/28/its-middle-night-do-you-know-who-your-iphone-is-talking.

[11] Joanna Stern, *iPhone Privacy is Broken…and Apps Are to Blame*, WALL STREET JOURNAL (May 31, 2019), https://www.wsj.com/articles/iphone-privacy-is-brokenand-apps-are-to-blame-1155931640.

Arguing that "Apple reaps huge profits selling the glass rectangles on which the more invasive apps run,"[12] he has called for Apple to do more to restrict these apps from gathering user data. Indeed calls for Apple (or another platform maintainer) to remove an app or category of apps from the app store are relatively common. Mark Cuban even called for Apple to remove Twitter from its app store.[13]

App stores have also created an easy way for developers to reach users. Still, the low barriers to entry lead to a saturated market, and downward pressure on prices, which app stores fail to alleviate by offering features such as free trials and upgrade pricing. Additionally, app store features like in-app purchasing may have been introduced with the best of intentions but often used as part of addictive, casino-like game mechanics, such as loot boxes[14] and pay-to-win designs.

Another line of criticism is uneasy with the idea of app stores themselves, and the control they afford platform owners—the ability to privilege some apps over others, the ability to impose cultural or moral norms on users, and the ability to extract revenue from apps the platform maintainers did not themselves create. David Weinberger once called the Apple app store, "the seductive angel of death for computing. It enables Apple to keep quality up and, more important, to keep support costs down. But a computer that can't be programmed except by its manufacturer (or with the permission of its manufacturer) isn't a real computer."[15] Less poetically, but along the same lines, Jonathan Zittrain has argued that the iOS app store is "much worse" than the anticompetitive behavior that Microsoft was sued over in the 1990s, calling for users to abandon closed platforms for open ones in a spirit of "hewing to the original spirit of the PC."[16]

App stores are not wholly "good" or "bad," but they can be operated well or poorly. Some tradeoffs are inevitable: a fully "open" software platform for everyone is risky from a privacy and security perspective, while a closed one would lack the third-party energy and creativity that generates new ideas, drives the platform forward, and benefits users. Rather, after discussing some of the issues that have arisen, the paper will suggest specific ways that these tradeoffs can be *managed* in ways that

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[12] Ian Bogost, *Apple's Empty Grandstanding About Privacy*, THE ATLANTIC (January 31, 2019), https://www.theatlantic.com/technology/archive/2019/01/apples-hypocritical-defense-data-privacy/581680.

[13] Hope King, *Mark Cuban Says Apple Should Ban Twitter*, CNN (December 10, 2015), https://money.cnn.com/2015/12/10/technology/mark-cuban-apple-twitter-criticism/index.html.

[14] Responding to criticism, Apple now requires that games disclose the odds of obtaining particular rewards. Chaim Gartenberg, *Apple Now Requires Games with Loot Boxes to Disclose Odds*, THE VERGE (December 21, 2017), https://www.theverge.com/2017/12/21/16805674/apple-loot-box-app-store-games-odds-probability-disclosure.

[15] Jonathan Zittrain, *Tales of Technolust: the appStoreless Droid*, JoHo the Blog (October 18, 2019), https://web.archive.org/web/20100415155852/https://www.hyperorg.com/blogger/2009/10/18/tales-of-technolust-the-appstoreless-droid/.

[16] Jonathan Zittrain, *The Personal Computer is Dead*, MIT Technology Review (November 30, 2011), https://www.technologyreview.com/2011/11/30/189455/the-personal-computer-is-dead/.

maintain the benefits of both security and control, as well as competition and dynamism.

It is undeniable that platform maintainers—and Apple will be the primary but not sole focus of this paper[17]—have the incentive to manage these issues themselves, since they benefit both from a platform that users trust and can rely on, and from a vibrant ecosystem that includes many third-party developers. Still, a platform maintainer can sometimes err on the side of self-preferencing, or even in favor of making policy choices that are easier to administer or cheaper to implement. When a platform such as iOS or Android achieves a certain amount of marketplace dominance, the platform maintainer in its role as a gatekeeper may fail, at times, to make the socially optimum tradeoff or one that benefits users. When switching from one platform to another carries high costs due to a user's software investment or exclusive services, and when a platform's value is enhanced via various forms of network effect, normal market forces alone are not enough to discipline a platform's behavior.

Any software platform might raise questions of consumer protection, user rights, or competition. However, *dominant* platforms in particular, if managed correctly, can create positive externalities that ripple through the economy that the platform maintainer might not (and should not) be able to capture for itself. While these positive externalities are one of the chief benefits of well-maintained infrastructure, platform maintainers may lack the incentives to maximize them. Again, while various policy proposals exist that discuss precisely *how* to encourage or require a platform owner to make various changes (e.g., through antitrust, or sector-specific regulation), this paper will focus on what those changes should be.

Examples of App Stores

The app stores that this paper will primarily address are the dominant and default ones on the two major mobile platforms: Apple's App Store on iOS, and Google's Play Store on Android. They are the app stores that control access to mobile devices, which are the most indispensable general-purpose computing devices in most people's lives, and the two platforms that most easily meet the standards of "dominance."

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[17] Globally, the market share of iOS is much smaller than that of Android. iOS has greater market share in the US overall, but is dominant in the premium segment of the smartphone market, and in tablets. Additionally, Apple simply has a more controlling approach to its platform than other platform maintainers like Google and Microsoft so it simply offers more fodder for discussion. Being more "controlling" in this context is not necessarily a bad thing; this approach also means that in many ways Apple protects user security and privacy better than the competition. But its policies are stricter in many senses and thus deserve more consideration.

As Public Knowledge has discussed before, "dominance" is a complex question, but determining whether or not a platform is dominant can be guided by looking at the "cost of exclusion" from a platform—a measure of what costs a business, organization, or individual would bear from being excluded from the platform.[18] A platform where being excluded carries a high cost would most likely be considered dominant.

Additionally, dominance may correlate with but is not identical to "market power." By way of analogy, when the Financial Stability Oversight Council (FSOC), which identifies risks and responds to emerging threats to financial stability, considers whether a bank is "systematically important," its inquiry is not limited to market share, but its structural role.[19] Market power itself must be considered both from the perspective of users and developers. From the user's perspective, what matters is not just whether a consumer can choose an Android phone or an iPhone, but whether, once invested in a particular platform, it is easy to switch. A user switching from Android to iOS not only must purchase a new device but also might lose access to a library of purchased software or full integration with Google Assistant. Conversely, a user switching from iOS to Android would lose access to iMessage and other Apple services as well as a library of software.

But even if users could seamlessly switch between numerous platforms at a moment's notice, developers still have no choice but to meet users where they are. Other factors, such as the extent of bottleneck control, barriers to entry, the nature of the user base, and industry structure, also contribute to a finding of dominance. As with other aspects of proper implementation, the exact legal mechanisms by which an app store (or any other platform) would be found to be dominant is beyond the scope of this paper, which is more concerned with what the consequences of such a finding should be.

Apple and Google stores have significant policy differences. For example, Apple is more stringent in its app review standards, while iOS devices do not allow "sideloading," or the installation of apps from other sources than the official app store; Android devices do. But, Android devices are not just controlled by Google—while Google does have contractual relationships with phone manufacturers that ship devices that can access the Google Play Store and other Google services, manufacturers still have some leeway, and can include their own apps and even app stores on devices in addition to Google apps, and this can raise competitive concerns. There are also policy differences with respect to in-app purchase requirements and other matters. That being said, the stores are broadly similar in

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[18] Harold Feld, THE CASE FOR THE DIGITAL PLATFORM ACT, (May 2019), https://www.publicknowledge.org/assets/uploads/documents/Case_for_the_Digital_Platform_Act_Harold_Feld_2019.pdf.

[19] John Bergmayer, EVEN UNDER KIND MASTERS, (May 2018), https://www.publicknowledge.org/assets/uploads/blog/Even_Under_Kind_Masters.pdf

most ways, and even though, unlike on iOS, the Play Store is not the only way for most users to load software on their devices, as a practical matter being listed on the Play Store is vital to most developers.

However, these two are not the only app stores. Apple also has an app store for the Mac, for instance. Installing software on the Mac is still possible from other sources, though through user interface choices, Apple is increasingly making it difficult for users to install *unsigned* software—a technical point (discussed in more detail below) that provides security benefits, but is not without its own potential pitfalls. Similarly, Microsoft has an app store for the Windows platform, and Amazon has one for its Fire tablets (and the ability to purchase "skills" for the Alexa voice platform). While examples from these app stores may be illustrative to show what different practices are possible, the Amazon Fire platform for tablets, and the Mac and Windows app stores (which are lightly used, compared with traditional software installation methods) are not likely to be found dominant.

Modern video game console platforms all include app stores. While it is (for now) still possible to buy a video game on disc, or memory card, increasingly games are distributed as digital downloads, and if anything the policies of video game consoles are much stricter than found anywhere else. Console platforms have more rigorous quality, content, and performance requirements than Apple or Google, and they also approve all disc- and card-based software before it's distributed. However, because of the limited range of software that these app stores distribute, and because their business model is consistent with the decades-old model for the distribution of console games, they appear to be less controversial. From a computer science perspective, a video game console is just a computer. But modern microwaves and cars include powerful (by historical standards, at least) computers as well. Video game consoles are different, of course, in that they are platforms that run third-party software, and because video games are an important means of cultural expression. Nevertheless, the existence of more open, general-purpose platforms like the PC and modern mobile devices, and the competitive nature of the game console market, slightly lessens the need for the same level of openness from dedicated devices with a limited purposes, and factors into the "cost of exclusion" factor in a dominance analysis. Thus, without disregarding that video game consoles (as well as cars and microwaves) can carry with them competition and consumer protection problems of their own, this paper will largely concern itself with general-purpose devices.[20]

TV app stores pose a similar issue as video game consoles. Modern TVs (and TV-connected devices such as the Apple TV or a Roku) are full-fledged computers, integrated with various app stores. However, the predominant apps for TVs are for

[20] It is also the case that video game consoles are often sold at a subsidized price, or at cost, with the expectation that software licensing fees will make up the difference. The same is not true of most other devices, such as phones, where relatively few users pay for third-party apps at all.

streaming media, and to a lesser extent, games—the occasional productivity app like James Thompson's PCalc[21] for Apple TV notwithstanding. There is likely a stronger case for applying the recommendations of this paper to TV devices than to game consoles but owning to their relatively narrow use cases, and because it is not clear which, if any, TV platforms are dominant, this paper will not discuss them in-depth.

On desktop platforms—which are typically the most open of all major consumer computing platforms—several third-party app stores thrive. The most successful is Steam, which has almost become the default way to distribute PC games. Users are rarely forced to go through Steam to obtain games, and PCs can have multiple game stores installed simultaneously, as well as supporting installing software directly from a developer (what would be called "sideloading" on mobile devices). Yet developers still choose to distribute through Steam, even though it takes a 30 percent cut of sales,[22] because users demand it. This is a useful demonstration of how, while it may be true that some app stores abuse their gatekeeper position, many users still prefer to rely on them despite having alternatives, and that users can benefit developers by generating and aggregating demand. (Other popular third-party app stores on PC platforms include the Epic Games store and GOG ("Good Old Games"), which offers titles free of DRM (digital rights management).) For reasons similar to the issues with game consoles, and because these third-party app stores, by definition, lack the same level of gatekeeper control as app stores that are integrated and run by the platform vendor itself, these app stores are beyond the scope of this paper's recommendations, while serving as examples of how the policies of the dominant mobile app stores are not set in stone.

App stores vs security architectures

App stores are typically associated with a series of security and control measures that, strictly speaking, are conceptually separate. That is, it is possible to have an app store without any security measures. And it is possible to implement most security measures without an app store—that is, security measures are platform features, or features of the operating system or device, more than "app store" features. Much of this paper will be concerned with Apple's iOS App Store and platform for a number of reasons, as it presents an example of an app store and platform that implement all of the security and control measures discussed here. In discussions of Apple's App Store, the distinction between what counts as a platform restriction and an app store restriction may be overlooked. But, for clarity, this section will briefly describe the various security and control measures that an app

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[21] James Thomson, *About PCalc for Apple TV*, https://pcalc.com/tv/index.html.
[22] Tom Marks, *Report: Steam's 30% Cut Is Actually the Industry Standard*, IGN (October 7, 2019, updated January 13, 2020), https://www.ign.com/articles/2019/10/07/report-steams-30-cut-is-actually-the-industry-standard.

store and platform may implement, and which Apple's platform does implement, before providing examples of app stores that implement only some or none of them.

Exclusive source of software

An app store may be, practically speaking, the only way to install software on a platform, which gives it competitive importance and makes it a key gatekeeper—if a developer can't reach the app store, it can't reach users, and users look exclusively to the app store to install software.[23]

An app store doesn't have to be completely airtight as a source of software for it to have effective gatekeeper power.

For example, on iOS it is always possible to run web apps. In fact, after the iPhone was announced, but before the App Store was, web apps were the only way to run third-party software on the iPhone. Steve Jobs called this a "pretty sweet solution." Apple commentator John Gruber called it a "shit sandwich," instead. This is because web apps are widely viewed as inferior to "native" software, which is[24] faster, more capable, and behaves in a more predictable manner due to using system-standard controls and features. Since that time, web apps have become significantly more capable. Apple has also been accused of slow-rolling the implementation of the new web standards that allow its Safari browser, while not allowing browsers with competing web rendering engines into its App Store.[25]

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[23] The app developer Rogue Amoeba has noted that this gatekeeper power makes it difficult for developers to publicly air grievances with how app stores function. Rogue Amoeba, https://twitter.com/RogueAmoeba/status/1273637152685985795 (June 18, 2020) ("Unfortunately, shipping iOS software means being on the iOS App Store. Because of this, many developers are scared to speak out.")

[24] Web apps are typically run in the browser, though they can be "installed" to a user's home screen as well, and newer "progressive web apps" can offer features previously restricted to native apps (and can raise similar security and privacy considerations). Web apps can also be simply packaged up as "native" apps and released into the app store. Mark Zuckerberg once called using web technology rather than native code for its app Facebook's "biggest mistake," Christina Warren, *Zuckerberg's Biggest Mistake? 'Betting on HTML5'*, (September 11, 2012), https://mashable.com/2012/09/11/html5-biggest-mistake.

[25] While third-party browsers are allowed in the app store, they must use Safari's WebKit rendering engine, which is available system-wide to apps that want to display web pages. So, while Firefox, Chrome, and other browsers can compete on the basis of UI enhancements, and can sync with their desktop counterparts, they cannot compete with Safari in terms of implementing new web standards more quickly, or JavaScript performance. In fact, until iOS 8, third-party apps could not even use the same JavaScript engine that Safari used, and were stuck with a slower version, due to apparent security considerations that Apple proved able to work around. Finally, even with those caveats, third-party browsers still cannot be set as system defaults, meaning that links from apps will still default to opening in Safari instead of what a user's preference might be.

Web apps aren't the only alternative to the App Store. iOS developers, for instance, can install their own apps on their devices after compiling them from source code. In fact, an iOS developer can download, compile, and install any app for which the source code is available, including apps in categories that Apple does not allow in the iOS app store at all. While various tools try to automate this procedure for less advanced users, it is in general a technically daunting process requiring detailed knowledge of software development processes. And there are other reasons why this is hardly a loophole that undermines Apple's gatekeeper control: Without a paid developer account (which costs $100 per year), apps installed in this way expire after a few days and need to be re-compiled and re-installed. That might be fine for a student or a hobbyist to test an in-progress app, but it is hardly a convenient alternative to the app store.

Finally, it is possible to install software outside of the app store by using an "enterprise certificate." This is a capability offered to businesses that want to make job-specific apps that don't necessarily belong in a public app store—apps that concern inventory management, reserving company resources, and internal communications, for instance. Apple's control over these certificates is not fool-proof. Facebook and Google were found to be using them to distribute apps to the public that would not be allowed in the Apple App Store, due to how they intrusively monitored user activity; Apple subsequently temporarily revoked both company's certificates, not only disabling the customer-monitoring apps but also internal iOS apps used by both companies. Various grey-market companies also use enterprise certificates in an unauthorized way to sell users apps in categories not allowed in the app store (e.g., BitTorrent clients and game emulators) as well as pirated software.

Code-signing

Modern cryptography often uses a pair of keys, public and private. With this sort of public-key cryptography, anyone can encrypt a message to a desired recipient using the public key, which can be freely shared, but only that recipient can read it by using the private key, which is not shared.

Code-signing is a variant of this design. It allows a sender to cryptographically "sign" a message—that is, attach a sequence of characters and numbers to it—that can only be generated with the private key, but that can be verified as having come from a particular sender with the public key.[26] The exact methods vary, but what they have in common is that if even one character of the message is changed, removed, or deleted, the signature verification will fail. Code-signing thus provides

[26] The "message" that is signed in the case of code-signing is simply the computer code of a given software program instead of "Attack at dawn" but this makes no fundamental difference—computers store everything as numbers and the same kinds of cryptographic techniques can be used on any kind of data.

a way to verify that a given piece of computer code is exactly what a developer shipped and hasn't been changed or added to by malware or other sources.

By itself, code-signing doesn't do anything besides provide a method of verification. But if the platform also enforces rules related to code-signing—namely, that all code must be signed, and that unsigned code will not be run or will be subject to greater restrictions, then it can be quite powerful, both as a means to protect users and as a method of establishing and strengthening the control of platform maintainers.[27]

Notably, code-signing not only allows a user's device to verify the integrity of computer code, but also enables the platform maintainer, which typically issues developer certificates, to revoke software that has already shipped—meaning that already-installed software on user devices will no longer launch.[28] This can be useful if a developer's app is found to be harmful after it's available to the public. It is also another powerful tool in a platform maintainer's arsenal that could potentially be misused, or that the platform owner can be compelled to use at the request of a government.

Sandboxing and permissions

Sandboxing refers to techniques at the operating system level that ensure apps only have access to certain data and features— i.e., they have to "play in the sandbox." It might be implemented in many ways, and it might entirely prohibit apps from certain behaviors and certain kinds of access, or grant them that access in a controlled way (e.g., after user consent or via a trusted, system-provided intermediary process known as a "powerbox").[29]

Take the example of a user's contact database. Early versions of iOS let any app access this information, which follows the standard set by desktop operating systems such as Mac OS and Windows. However, users began to see this capability as a privacy violation, as some apps would access a user's contacts database and

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[27] In the early 2000s Microsoft worked on a trusted computing platform "that could make PCs resistant to tampering even by those who have physical access and control. The initiative would go under a variety of names, including Palladium, TCPA, and the Next-Generation Secure Computing Base." *See* Timothy B. Lee, *How four Microsoft engineers proved that the "darknet" would defeat DRM,* (November 24, 2017), https://arstechnica.com/tech-policy/2017/11/how-four-microsoft-engineers-proved-copy-protection-would-fail/. These efforts provoked serious backlash, and were in many ways ahead of their time. One difference between secure computing efforts like this and code-signing is that code-signing is typically enforced by the operating system; more comprehensive efforts are enforced at a hardware level, and in the case of PCs, could prevent the installation of alternative operating systems (e.g., Linux instead of Microsoft Windows). Modern smartphones and tablets do often implement security technologies of this kind. However, discussion of the extent to which secure hardware platforms limit competition at the operating system level.

[28] Apple's implementation of this used to require that it revoke all of a developer's apps at once, but its newer implementation, which is called "app notarization," allows it to revoke only specific apps.

[29] C2 Wiki, "PowerBox", http://wiki.c2.com/?PowerBox.

upload it to a server, for instance, to spam people with messages asking them to join a new social network. Subsequently, Apple began requiring apps to ask for permission to access contacts when they needed to do so (and preventing apps that do not truly need access to contact information from refusing to run until such consent is granted.)

Another example is document storage. Again, historically, desktop operating systems allowed all apps to read and write files from common storage areas in folders named things like "My Documents" or the Desktop. But in today's era of increased security consciousness, even this can cause problems. For example, if an app that has access to sensitive-use data stores it in such a location, other apps might access it without user consent. Platforms can design around this by denying apps access to such common storage areas, requiring explicit user permission before being granted such access, or by having such access being granted only during explicit user interaction and mediated by a "system-provided dialog." In other words, users can choose to open a file in an app, but that does not give the app unrestricted background access to the folder it was stored in).

Other features that may be "sandboxed" include camera and location access, the ability to view connected Bluetooth devices or Wi-Fi networks, other device sensors, and microphones, calendars, and photo library access.

Sandboxing can be incompatible with many kinds of apps—for example, an app that makes a complete backup of a user's computer or device may need unrestricted levels of system access. It can also cause competitive issues if first-party apps from a platform owner are not sandboxed, and thus have greater or more seamless capabilities than third-party apps, which are.

API restrictions

Software platforms offer "application programming interfaces" (APIs) which provide common functionality, preventing developers from having to write their own code to handle solved problems, or for apps to include third-party libraries. APIs can also offer functionality that can only be accessed through the API—for example, access to device sensors, personal data, or location information. Additionally, some APIs are "private" which means that third-party applications cannot use them. Undoubtedly restricting access to certain potentially sensitive functions can be good for security.[30] However, as with other points of control, the way that access to certain APIs is gated can raise competitive concerns, as first-party applications

[30] For instance, Uber was calling private APIs to access device serial numbers, so that it could track users even after they had uninstalled and reinstalled its app. The API that allowed this was not intended to be accessed by third-party developers and Apple required that Uber stop the practice. *See* Thomas Claburn, *Apple Frees a Few Private APIs, Makes Them Public*, THE REGISTER (June 13, 2017), https://www.theregister.co.uk/2017/06/13/apple_inches_toward_openness.

might have access to a functionality that third-party apps cannot replicate. For example, until iOS 8, only Apple's own apps could use the superior Nitro JavaScript engine, meaning that web views, and third-party browsers on iOS, were at a performance disadvantage relative to Apple's own Safari. On other computing platforms, developers were always free to use private APIs at their own risk. However, because they were not officially supported and documented, the platform might change how they work at any time without notice, breaking apps that rely on them. Whatever the merits of this *caveat emptor* approach, the app store review process adds yet another way to discourage the use of private APIs: namely, scanning submitted applications to see if they make calls to these APIs, and rejecting them if they do.

DRM

While code-signing ensures that a particular app is the actual code released by a particular developer, DRM ties a copy of an app to a particular user. Short for "Digital Rights Management," DRM can be controversial (for example, when it locks ebooks to particular services and devices like the Amazon Kindle, creating an obstacle to users switching devices or even shopping around for a new source to access ebooks). Even so, many developers approve of DRM as they view it as a way to reduce piracy. In the context of modern devices with app stores and other methods of control, DRM is just one piece of the puzzle, but it serves critical technical functions, such as preventing apps without proper DRM from running on a device, and preventing users from moving even a fully code-signed app from one device to another.

Benefits of App Stores

App stores have benefits and drawbacks, and a primary purpose of this paper is to propose remedies for those drawbacks. But it is important to review the ways that app stores have been good for developers and for users—a narrow focus only on the drawbacks of app stores could lead one to reasonably ask why we should have them at all. But even with their various drawbacks, app stores have likely done more good than harm, and the recommendations of this paper are not only designed to promote the interests of users and independent developers, but to ensure that app stores continue to be a net benefit.

Perhaps the most vital feature that app stores provide users is trust.[31] Before home internet use was ubiquitous, and for some time thereafter, those relatively few

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[31] F. Cuadrado and J. C. Dueñas, Mobile Application Stores: Success Factors, Existing Approaches, and Future Developments, IEEE COMMUNICATIONS MAGAZINE, vol. 50, no. 11, pp. 160-167, (November 2012) ("We believe that consumer trust towards the individual applications from the platform is influenced by

homes that had PCs would (apart from the technically adept few who used bulletin board systems and the like) typically buy a PC in a box from a reputable retailer. Retailers served a number of important functions, such as curating and selecting software of reasonable quality. This reduced a user's search costs—consumers could just look through the software on the shelf, rather than researching every offering on the market—and perhaps ask store clerks and other experts what they recommended. And the buyers could be reasonably sure that the software they purchased from such retail establishments worked, more or less, and would not damage their machines or be malicious in other ways. This trust between consumers and home-PC retailers enabled the widespread adoption of one of the most important communication devices we've ever seen.

The advent of ubiquitous home internet access combined with the ability to install software directly from the web would seem to be another boon for both developers and users. No more gatekeepers! No more price markups! But the reality was far more mixed, since without the architecture of trust and selection that retailers provided, most users were at a loss as to what software was actually worth installing. Only enthusiasts would have the inclination to do the necessary research to figure out what software to install and what to avoid. It was worse than that, even, since nefarious users took advantage of the situation to release actively harmful software. Our ability to disseminate computer code far outpaced security practices that keep people, data, and computers safe.

The result of this wasn't just that people were confused as to what software to install, but that one group of ordinary users was often too afraid to install software at all, while another group would install software willy-nilly. (This latter group being inflated, perhaps, by the poor browser security architectures prevalent at the time, whereby simply visiting a web page and clicking a dialog box could result in the installation of fraudulent "antivirus" software, harmful browser toolbars, and so on.)

Web apps offered one solution to this problem by enabling people to use different software and services without "installing" anything at all—their computers became, in effect, terminals interacting with distant servers, along the lines of old time-sharing systems. (The ability to "install" a web app so that it can work offline and even interact with local data came later.)

App stores offered the other solution. By the time Apple launched the iOS App Store, app stores (and related ideas, like package managers in open source

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the approval process, and consequently the willingness of users to pay."), https://eecs.qmul.ac.uk/~fcuadrado/papers/commag12-appstore.pdf; *see also* S. Hyrynsalmi, M. Seppänen, & A. Suominen, *Sources of Value in Application Ecosystems*, JOURNAL OF SYSTEMS AND SOFTWARE, 96, 61-72, (2014), http://tutcris.tut.fi/portal/files/3591220/hyrynsalmi_sources_of_value_in_application_ecosystems.pdf.

operating systems) had been around for a number of years, and commercial app stores, like Valve's Steam, a very popular game store, had already achieved some success. And while even app stores on mobile platforms had pre-Apple precursors, it was Apple's App Store that gave the model for mainstream success, with ordinary users installing general-purpose software on a popular platform.

Apple's App Store became popular, in part, because there was no other way to install software on iPhones or distribute software to them. The iPhone was a popular platform and the App Store was popular because of that. But the success of optional, third-party app stores like Steam does show that the model has some inherent benefits, and that given the choice between buying software from an app store, and buying it directly from a developer, many users prefer the intermediation of the app store. The various benefits that app stores provide can help explain this.

Like traditional retail stores, app stores perform a curation and trust function. Because shelf space is not limited with digital app stores, curation becomes more a matter of editorial promotion, top-selling lists, user reviews, and recommendations, but the basic function is the same. App stores also provide trust—apps must be approved before being listed in the store, in most app stores by a human reviewer, and on all of them software is subject to batteries of tests to ensure compatibility, security, functionality, accessibility, and other issues.

App stores give users a place to search for software to install that is more structured than just searching the web. Because there is typically just one major app store for a platform (though not always), it gives users just one place to search—not great for competition, to be sure, but it does at least mean that if a developer is listed in that app store, a user is likely to encounter its app. This reach can benefit developers—if you're listed in the app store, you can be sure that you can reach the entire addressable market.

App stores also provide various services to developers and users. App stores install updates to software, ensuring that users have the latest features and security patches. They provide payment services, both for paid apps and in-app purchases. Deloitte categorizes some of the benefits of app stores as follows:

- *ubiquity in user interface/user experience features,*
- *a secure platform to promote their products,*
- *storage systems for hosting apps and managing downloads,*
- *billing service,*
- *a payment management system (micropayments) which makes it easy for mobile app developers to recover sales revenue.*[32]

[32] Deloitte, THE APP ECONOMY IN THE UNITED STATES, (August 20, 2018), Pg. 8. https://www.ftc.gov/system/files/documents/public_comments/2018/08/ftc-2018-0048-d-0121-155299.pdf.

It points out that these features generally reduce transaction costs—that is, they make it easier for developers to connect to users. This function—along with security and curation, and the concomitant increase in user trust—can be viewed as the primary benefits of app stores.

There are a few other benefits of app stores as well. Apps distributed via app stores may also have access to system APIs that might not otherwise be available; for instance, for a time iCloud synchronization services were only available to Mac apps distributed through the Mac app store.[33] (This paper will argue later that one solution to competition issues created by app stores without compromising security is to extend this idea of differential access to certain system features.) Finally, it should not be overlooked that app stores prevent piracy. While DRM can cause as many or more problems than it solves (particularly in the area of media), and while it is not foolproof, developers that choose to sell software on a commercial basis appreciate that platform enforcement of copy protection technology reduces unauthorized copying.

Drawbacks of App Stores

The same control and curation that make app stores an appealing method of software distribution, given the nature of computer security, privacy concerns, and other matters, also give the companies that control app stores and their associated platforms a tremendous degree of control over how users can interact with their devices, and whether and how developers can reach users. This control can be abused, and even if not abused, can lead to negative consequences. The most salient of these are harms to competition (and relatedly, constraint of developer business models), and harms to free expression. This section will discuss these in broad terms, and this paper will later detail a few specific instances that could be remedied with app store or platform policy changes.

It is hard to compete with a platform

One fundamental competitive concern is that it is very difficult to compete with a platform's own first-party apps. This manifests in a number of ways.

The power of defaults

The "power of defaults," or the default effect,[34] is a well-known phenomenon where default choices, options, and software settings will be what the majority of users

[33] While certain Android APIs are only available on Google-approved devices that carry the Play Store, sideloaded Android apps on official devices are not restricted in the APIs they can access.
[34] Wikipedia, "Default effect", https://en.wikipedia.org/wiki/Default_effect.

stick with, even if they can freely change them or choose a competitive alternative. Awareness of the power of defaults underlies many policy debates in the technology space; e.g., whether particular privacy regimes should be opt-in or opt-out. It also explains why a platform maintainer (or, in some cases on Android, a phone manufacturer) has such power—it sets the defaults, and can structure them in ways it finds advantageous. This plays out a number of ways. First, a platform's own apps may be preinstalled on user devices, and thus bypass the app store entirely. Users may not even bother to look for alternatives, or even be aware that they can. Even if first-party apps are downloaded through an app store, they may have other advantages: the user may be prompted to download them, they may get priority promotion within the store, or they may rank higher in app store search results. For example, the Wall Street Journal found that Apple's own apps routinely rank above those in app store search results.[35] While many developers attribute this to poor design rather than anticompetitive intent, the result can be the same.[36]

An extreme example of this is known as "Sherlocking"—when a platform maintainer takes a concept from a third-party app and creates its own similar app, or incorporates the functionality into the system itself. (The term derives from an instance where version 3 of Apple's Sherlock program replicated the functionality of a third-party app called Holmes.[37]) In economic terms, it has been "suggested that platform owners can bundle their own complementary application with their platforms to foreclose competitors' access to their customers and profitably capture the whole of their markets."[38] Even when a platform buys third-party software, the effect can be the same on competitors—for example, when Apple bought SoundJam and turned it into iTunes, the popular app Audion was driven out of the market.[39] Particularly when a platform maintainer bundles its own application, or uses data it has access through platform or app store metrics to decide which products or features to copy, this can be anticompetitive. Indeed, some developers have complained that Apple uses them for "market research"—using its visibility into what third-party apps are popular on its platforms to help decide what features it should introduce itself.[40]

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[35] Tripp Mickle, *Apple Dominates App Store Search Results, Thwarting Competitors*, WALL STREET JOURNAL (July 23, 2019), https://www.wsj.com/articles/apple-dominates-app-store-search-results-thwarting-competitors-11563897221.
[36] John Gruber, *Malice or Incompetence: On the Rankings of Apple's Own Apps in App Store Results*, DARING FIREBALL (September 12, 2019), https://daringfireball.net/2019/09/on_the_rankings_of_apples_own_apps_in_app_store_results
[37] *You've Been Sherlocked,* THE ECONOMIST (July 13, 2012), https://www.economist.com/babbage/2012/07/13/youve-been-sherlocked.
[38] Fung Zhu, *Friends or Foes? Examining Platform Owners' Entry into Complementors' Spaces*, J. Econ. Manag. Strat. 23, 24 (Spring 2019).
[39] Cabel Sasser, *The True Story of Audion,* (November 11, 2004), http://panic.com/extras/audionstory.
[40] William Gallagher, *Developers Talk About Being 'Sherlocked' as Apple Uses Them 'For Market Research'*, APPLE INSIDER (June 6, 2019), https://appleinsider.com/articles/19/06/06/developers-talk-about-being-sherlocked-as-apple-uses-them-for-market-research.

At the same time, "ideas" are not protectable by intellectual property rights (copyrights protect specific expression and patents protect specific implementations; neither protect general concepts) and it is beneficial when good ideas are copied widely. Platforms even copy good ideas from each other—for example, the Macintosh operating system was heavily inspired by the Xerox Alto, and in turn influenced Microsoft Windows—to, in turn, copy Windows features such as Command-Tab app switching (Alt-Tab on Windows)[41] and contextual "right click" menus. Additionally it makes sense to distinguish between a platform maintainer entering an adjacent or complementary market (such as an operating system vendor creating media streaming services and bundling them), versus a platform maintainer improving the platform itself, even in instances where the idea for the improvement was first implemented by a third party.

For example, hundreds of app developers hit on the idea of "flashlight apps" before iOS or Android included a feature that activated a phone's camera flash for that purpose. But it is difficult to see flashlight apps as a true independent market worthy of public policy concern. This applies broadly to "system utility" apps and, more generally, implies that when analyzing competition in platforms, it is important to distinguish a platform leveraging its position to capture an adjacent market from a platform improving its core product. Even when certain ideas are first introduced by third parties, the history of technology, and consumer products more generally, shows that some features should be included in the core product itself.[42]

Thus, while this paper argues that dominant platform maintainers should institute guardrails to protect independent developers, particularly when it comes to a platform maintainer selling or bundling standalone apps and giving its own apps and services technical or business model advantages not available to third parties, it does not recommend a complete ban on platform maintainers integrating new features into their system. Promoting competition does not requiring freezing technology products in time.

To be sure, distinguishing a bundled app from a feature of the system itself may be difficult, and is necessarily imprecise endeavor that requires knowledge of broader market and technological trends as well as user expectations. The analysis may

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[41] Prior to Apple directly incorporating this feature, it was available from a third-party application called LiteSwitch X. *See* Ammon Skidmore's Old Apps, https://sysbeep.com.

[42] Another example is how a third-party utility, Growl, first introduced a system-wide standard notification system for the Mac. Notifications are now seen as a basic feature of computing platforms. Further examples are almost endless. Cars did not initially ship with radios, now they do. Modems used to be aftermarket add-ons to computers, then were bundled, with their successors eventually integrated directly into a computer's motherboard. On mobile devices, taking panoramic photos used to require a third-party app, now this is a build-in camera mode. Image search used to be performed by specialized search engines, and now major search engines all have an image tab. It would not benefit users to prohibit these kinds of developments.

even change over time. Microsoft bundling its Internet Explorer browser with Windows as widely seen as anticompetitive in the 1990s. Now, a computing device that does not include a browser would be considered broken, since web browsing is a primary purpose of computing devices, and the web may be the only way to install software onto a desktop computer. (The changes that have occurred since the 1990s may be most profoundly illustrated by the fact that while Microsoft still bundles a browser with Windows, Google's Chrome, which has to be installed by users, nevertheless has much higher usage share, showing that user preference can still overcome the power of defaults.)

The advantage that first-party apps may have on a system can even be as mundane as the platform reserving basic, generic terms to itself, naming its music app "Music," its notes app "Notes," or its browser, "Internet" (the name for Samsung's browser)—words that, among other things, users are more likely to search for and associate with their basic function.

First-party apps may also be set as defaults, even when third-party apps are installed, with no way to change this setting. Thus, even if a user would prefer to use Outlook or Gmail as their email client, on iOS, "mailto" links open in Apple Mail, and even if a user would prefer to use Firefox or Brave, web links open in Safari.

First-party apps exempt from platform rules and given special privileges

Similarly, first-party apps may simply play by different rules and have different access to technical features of the system than third-party apps available on the app store. Apple's own apps can take advantage of private system APIs that third-party apps cannot.[43] There are good reasons for third-party developers not to use private APIs; namely, they can change without notice, rendering an app non-functional. Public, documented APIs are typically only changed with ample notice to developers who depend on them.[44] Private APIs may also have access to information that may be kept from third-party apps for privacy reasons, such as a device's serial number. At the same time, when key, useful functionality is only available through a private API, or not at all, third-party developers can be put at a disadvantage—the fundamental disparity is not the restriction on the use of private APIs but that certain functionality is only available through them.

First-party apps may even have default access to information that, for third-party apps, must be affirmatively granted. As discussed more at length below, Apple's

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[43] Michael Mimoso, *Apple to Remove 256 iOS Apps Using Private API's, Collecting Personal Data*, THREATPOST (October 19, 2015), https://threatpost.com/apple-to-remove-256-ios-apps-using-private-apis-collecting-personal-data/115098.

[44] *See* John Gruber, *Private*, DARING FIREBALL (December 22, 2018), https://daringfireball.net/2008/12/private.

first-party apps and services have access to system-level location information that third-party apps must ask for.

First-party apps may also be able to access certain sensors or data without first asking for permission, or may be the only apps that can access certain things at all. For example, until Apple released iOS 13, only Apple apps could use an iPhone's near-field communication (NFC) chip, which is used for such functions as contactless payments.[45] A similar scenario is currently playing out with the iPhone's new ultra-wideband chip, which only Apple apps can access.[46]

A platform maintainer can better plan for platform changes

Additionally, when system features change from one OS version to the next, third-party apps may suddenly become incompatible or exhibit new bugs, putting them at a major disadvantage until developers update them to address the changes. In the meantime, platform-provided apps tend to be updated along with the OS itself, and the platform company's own developers have access to the future platform roadmap in ways that outside developers do not.

One extreme example of the difficulty third-party apps can have when competing with first-party apps is from early in the iOS App Store history, when Apple forbade third-party apps from "duplicating the functionality" of first-party apps.[47] While Apple eventually eased off this policy, it shows the power and control that app stores have.

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[45] Blue Bite, iPhone NFC Compatibility, (April 16, 2020), https://www.bluebite.com/nfc/iphone-nfc-compatibility.

[46] Nick Statt, *Airdrop on the iPhone 11 Will Let You Point at People to Share Photos*, THE VERGE (September 10, 2019), https://www.theverge.com/2019/9/10/20859550/apple-iphone-11-pro-airdrop-u1-locator-chip-tag-tile-bluetooth-tracking. Among other things, UWB allows devices to more accurately gauge the position and distance of other UWB devices, and is harder to spoof. While macOS is not the specific topic of this paper, it is notable that on the Mac App Store, Apple has exempted its own apps from sandboxing rules that third-party apps were required to follow. For some time, its own iWork apps were available on the Mac App Store, but not sandboxed. *See Michael Tsai, iLife, iWork, and the Sandbox*, MICHAEL TSAI BLOG (October 30, 2013), https://mjtsai.com/blog/2013/10/30/ilife-iwork-and-the-sandbox/. XCode, Apple's development environment for iOS and Mac apps, is distributed through the Mac App Store and is not sandboxed to this day.

[47] Charles Arthur, DIGITAL WARS 186 (Kogan Page 2012) ("Apple began behaving in odd ways: it would ban apps for seemingly random reasons, such as 'duplicating the functionality of existing iPhone apps'. Mail programs, browsers, podcast downloaders – those would be rejected. Developers howled, and howled even more loudly at being told they couldn't howl publicly because of Apple's non-disclosure agreement on rejections." *See, e.g.*, Angelo DiNardi, *MailWrangler and the Apple App Store* (September 20, 2008) https://angelo.dinardi.name/2008/09/20/mailwrangler-and-the-apple-app-store.

A platform maintainer doesn't need to make money on apps or services

Finally, platforms don't need to make money on any of their apps at all, at least not their basic apps. Apple, for instance, makes money selling iPhones, not licenses to its Notes app. The purpose of the Notes app is simply to enhance the value of the iPhone. This paper does not suggest that it is anticompetitive for platforms to provide basic apps of this kind for free, as devices should have basic out-of-the-box functionality. But competing with free is obviously a challenge for any developer.

App stores place business model constraints on developers

App store requirements and policies can also place competitive constraints on developer business models.

The sales commission reduces developer revenue

The most straightforward of these is the often mandatory commission that app stores charge developers for paid apps, which reduces developer revenue. Most app stores—Apple's, Google's, and Steam, for instance—take around 30% of the list price.[48] Although this is a lower rate than what physical retailers typically charge for boxed software, it's still much higher than the rates charged by pure payment processors and pure storage providers. App stores do provide value beyond those simple services, of course, but in many cases, developers do not have the choice of whether to avail themselves of that value. On the Mac, for instance, developers can choose whether the distribution, exposure, update mechanisms, subscription systems, and promotion that come with distributing on the Mac App Store is worth it or not. Many apps find that it is. Many do not. In this instance, this has forced Apple to improve the Mac app store while also ensuring that apps distributed outside of it have some measure of security and are not locked out of platform features like iCloud sync. However, iOS provides no alternative. On Android, the other major mobile platform, it is possible to distribute apps outside of the app store, but it is a somewhat complex process that most users will only undertake for the most compelling of apps (e.g. the popular game, Fortnite).

Restrictions on free software prevent users from accessing some apps

"Free software" is released under a license such as the GNU General Public License (GPL) that allows software to be redistributed and modified freely, but only on the condition that the application's source code be made publicly available.[49] (As the

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[48] Tom Marks, *Report: Steam's 30% Cut Is Actually the Industry Standard*, IGN (October 7, 2019, updated January 13, 2020), https://www.ign.com/articles/2019/10/07/report-steams-30-cut-is-actually-the-industry-standard.

[49] "Free software" is a more restrictive category than software that is merely "open source," which may not face the same difficulties with app store distribution.

saying goes, it is free as in speech, not free as in beer, though it is often both.) Of course, the sole author or rightsholder of a piece of free software can release that software on any app store, since a rightsholder is not bound by the terms of a license it issues to others. But a developer that incorporates a piece of free software into its own app, or even a person that wants to distribute an existing free software project on an app store, may find that doing so would violate the terms of the license for any number of reasons. The problem can be particularly complex with free software projects where individual volunteer developers retain the rights to their individual contributions.[50] The DRM that app stores may require may itself violate the terms of a free software license that requires the software to be redistributable, for instance, or it may not be possible to distribute or make source code available using app store tools.

A lack of paid upgrades removes a traditional source of recurring revenue

Another example is paid upgrades—or the lack thereof. A standard software business model has historically been to sell customers an initial license at one price and future licenses at a discounted rate. This rewards loyal customers and gives developers a recurring source of revenue and the ability to make a living from a fixed customer base instead of continually needing to reach new customers. It allows users to decide whether particular upgrades are worth paying for—some users might choose to skip a version or two. At the same time, from the developer's perspective, this model makes customers more likely to continue using the developer's software instead of shopping around for a better deal.

None of the major mobile app stores have a paid upgrade mechanism, however. This has several consequences. It might mean that a developer sells a license to its software once and continues to provide updates for free, indefinitely.[51] This may seem to be the most customer-friendly option. However, almost all software requires

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[50] This was the issue that popular free video player VLC faced. After being pulled from the app store because of complaints from individual contributors / rightsholders, *see* Marco Tabini, *Licensing Dispute Could Drive VLC Out of the App Store*, MACWORLD (November 1, 2010), https://www.macworld.com/article/1155338/vlc_licensing.html, its returned after a substantial rewrite. *See* Felix Paul Kühne, Press Release, *VLC for iOS 2.0*, VideoLAN (July 18, 2013), https://www.videolan.org/press/ios2out.html.

[51] Certain updates—such as security patches, and compatibility updates that require minimal developer effort (for example, a recompile with some settings adjusted)—perhaps *should* be provided for free. But developers of commercial software often depend on recurring revenue from upgrades, and the alternatives (subscription models, selling new versions as new apps) can fall short in a number of ways. This issue has been often discussed in the Apple community. *See* Nat Swanner, *Apple's Refusal to Allow Paid Upgrades in the Mac App Store Hurts Developers and Users*, THE NEXT WEB (August 16, 2015), https://thenextweb.com/insider/2015/08/16/apples-refusal-to-allow-paid-upgrades-in-the-app-store-hurts-developers-and-users/, also Kirk McElhearn, *App Store upgrades: It's not that Apple can't do it, but they won't do it*, Macworld (May 12, 2017), https://www.macworld.com/article/3196016/app-store-upgrades-it-s-not-that-apple-can-t-do-it-but-they-won-t-do-it.html.

ongoing maintenance to add new features, patch security flaws, and keep up with platform changes. A business with one-time income but recurring costs is simply not sustainable. It may work if the initial payment is high enough or the velocity of new customers is great enough—but it rarely is, and many applications soon reach a saturation point. In the initial growth phase of mobile platforms, perhaps these problems were masked. But now, the lack of upgrade pricing causes many developers to abandon apps after release or to seek out an alternative business model where possible.

One alternative to upgrades is to list major app updates on the app store as a new app, rather than an update to the existing app. Under this model, an existing app may get basic security and compatibility updates for a time, but a user would have to buy the new app—or rather, the new listing for the updated version of the same app—to get major updates. But this approach has costs. Users who are accustomed to free updates, or discounted upgrades, may feel they are getting ripped off—even if the cost of the new app, up front, is simply what the cost of an upgrade would have been to begin with.[52] Upgrade pricing feels like a perk for loyal customers, and this model lacks that. More saliently to developers, the lack of a lower-cost upgrade path for existing users makes it more likely they will just buy an entirely different app rather than upgrading. While arguably good for competition, this leads to less predictability for existing developers.

It is possible to work around these shortcomings—for example, the iOS App Store has a "bundle" feature that enables consumers to buy apps together at a discount, which is pro-rated if a user has already purchased an app in the bundle. By creating a bundle containing both the old app and the new app, some developers have created what amounts to a discount on the new app for people who have already purchased the old app. While this does somewhat replicate upgrade pricing, it has downsides as well; namely complexity, and the fact that it requires that the old app continue to be listed on the store, which can lead to inadvertent purchases of the old, rather than the new, app.

The increased ease of creating and distributing software that platform maintainers have created, as well as forcing all sales into a single channel, has created a downward pressure on app pricing—it is difficult for a developer to charge an up-front price for an app at all (or at least not a significant one) which to an extent makes problems around paid upgrades beside the point—the problem is getting paid at all. As early as 2009 observers were noting that the pricing of apps was headed close zero,[53] and according to Business of Apps, "In May 2019, the average

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[52] Selling all copies of a new app at the price of an upgrade could lead to lower developer revenue, or lead to more due to increased sales. The lack of flexibility for developers means it is hard to run natural experiments.

[53] John Herrman, *The App Store Effect: Are iPhone Apps Headed for Oblivion?*, GIZMODO (October 16, 2009), https://gizmodo.com/the-app-store-effect-are-iphone-apps-headed-for-oblivi-5378390.

cost of apps on the Apple App Store came to a $1.01. Games (in which the freemium revenue model is particularly prevalent) average $0.49. Collectively the average price for all apps is $0.88."[54] While niche software developers have found ways to charge up-front prices for apps,[55] the lack of paid upgrades as well as the general downward pressure has led to various other business models.

Arbitrary rule enforcement discourages developer innovation

Arbitrary and inconsistent application of app store rules can also prevent developers from creating certain kinds of apps, even if they do not violate any written rule. When Apple first introduced a "widget" function, for instance, it at first disallowed complex widgets like calculators,[56] before changing course.[57] Independent app developer Rogue Amoeba has observed, "Apple first approved, then removed, a major v3 update, seemingly because it competed with an Apple HARDWARE product. A huge feature, which violated no written rule, had to be pulled. Months of work were lost,"[58] and "After an incident-free v1.0 launch, v1.0.1 bug fixes were held up for 3+ months, due to Apple's total misunderstanding of how IP law works at a basic level. After much public fighting, our updates were eventually allowed."[59]

Typically, app stores provide little in the way of explanation as to why an app might have been rejected beyond a reference to a general rule, without individualized guidance or feedback, or an explanation of why similar apps might have been accepted, but not the one in question.[60] Developers have no formal due process rights, and platform maintainers appear free to apply "rules" that don't really exist, or develop new interpretations of existing rules on the fly, with little recourse other than the court of public opinion.

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[54] Mansoor Iqbal, *App Download and Usage Statistics (2019)*, BUSINESS OF APPS (April 24, 2020), https://www.businessofapps.com/data/app-statistics/.

[55] For example, Tot for iOS, a new app, costs $20. Federico Viticci, *Tot Review: Collect and Edit Bits of Text*, MACSTORIES (February 27, 2020), https://www.macstories.net/reviews/tot-review-collect-and-edit-bits-of-text.

[56] Jordan Kahn, Apple Making iOS 8 Notification Center a Bit Less Useful by Banning Calculator Widgets (October 29, 2014), https://9to5mac.com/2014/10/29/apple-making-ios-8-notification-center-a-bit-less-useful-by-banning-calculator-widgets.

[57] *See* PCalc, About PCalc for iPad, iPhone, and Apple Watch, https://www.pcalc.com/ios.

[58] Rogue Amoeba, https://twitter.com/RogueAmoeba/status/1273635569617305601?s=20 (June 18, 2020).

[59] Rogue Amoeba, https://twitter.com/RogueAmoeba/status/1273634800751050753?s=20 (June 18, 2010).

[60] While most developers do not publicly document their app store rejection stories, there are numerous examples. This story provides an overview of some of them: Ryan Christoffel, *10 Years of App Store Controversies*, MACSTORIES (July 18, 2018), https://www.macstories.net/stories/10-years-of-app-store-controversies. *See also* TJ Addams, *My Apple App Store Rejection and Approval Story* (August 13, 2019), https://medium.com/swlh/my-apple-app-store-rejection-and-approval-story-cc692a6cb7e3;

Incentivizing ad-supported apps is problematic in a number of ways

Advertisements are one common business model that developers adopt in response to the business model constraints of the app store. An ad-supported app does not have to pay 30% of its sale price, or of an ongoing subscription or of continuing in-app purchases, to the app store. It does not have to worry about the lack of recurring revenue that the lack of a paid upgrade model creates. It does not have to worry about "race to the bottom" pricing.

That said, advertisements are hardly an ideal outcome as a means to support software development. Ads are necessarily intrusive, and on smaller devices, may take up valuable space that would otherwise be devoted to application functions or content. Downloading and displaying ads may degrade the performance or battery life of a user's device. Ads may present a risk to user privacy, and depend on or incentivize intrusive data-collection and the user of personal information in other ways.

These considerations concerning advertisements raise concerns and questions beyond the scope of this paper, but it is at least relevant to observe that plentiful ad-supported "free" apps for users is not necessarily the best market outcome given the externalities that ad-supported business models create, even if users tend to gravitate toward apps with the lowest up-front cost. (One example where this can go wrong is with "free" weather apps. Because weather apps, by their nature, are more likely to gather granular user location data, they are more likely to carry unacceptable privacy tradeoffs that users may not even be aware of.[61])

To the extent that platform maintainers value user privacy and promoting quality experiences, they should not actively promote and favor ad-supported apps over other business models. Instead, ads should be one option among many, instead of the path of least resistance for developers looking to develop a sustainable business model.

App stores encourage subscriptions, which don't always make sense

Some developers have adopted subscriptions as another business alternative. Subscriptions are, of course, the logical and predominant business model for video and music streaming services. The subscription model is ideal for software in some ways, as it creates ongoing revenue that offsets ongoing costs—both development and maintenance costs, as well as infrastructure costs for back-end services that may be associated with software.

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[61] Jason Koebler, *Stop Using Third-Party Weather Apps*, MOTHERBOARD (January 4, 2019), https://www.vice.com/en_us/article/gy77wy/stop-using-third-party-weather-apps.

But this model has its downsides as well. First, in-app subscriptions are treated as in-app purchases, which means that the developer pays the 30% of the subscription price (less, after a time) to Apple or Google up front. Subscriptions also add complexity to how developers design and monetize their apps. As developer Brent Simmons wrote,

> The best part of the App Store, years ago, from this developer's point of view, was that it was easy to charge money for an app. No need to set up a system — just choose the price, and Apple takes care of everything. So easy!
>
> But these days, in almost all cases, you'd be ill-advised to charge up front for your app. You need a trial version and in-app purchasing (IAP) and maybe a subscription.
>
> Here's the thing: this is a *massive* pain in the ass to implement, test, and support — Apple does *not* make it easy.[62]

Additionally, customers may object to paying for subscriptions for services that are not immediately visible to them. Subscriptions are traditionally seen as a subscription *to* something—in the digital context, perhaps some cloud service or media library. Subscribing to a podcast player or a calendar app is another matter. In general, subscriptions might make the most sense for major app developers like Adobe or Microsoft, not smaller developers, or for software that is more typically sold to businesses.

Increasingly, subscriptions are more like a patronage model that provides ongoing support for a developer to continue work on her project rather than a fee that offsets a specific marginal cost. Patronage models have many benefits and can work well for some kinds of creators, as the success of services like Patreon shows. At the same time, users have little insight to whether their payments truly are going to fund further development and maintenance of the app. In any event, patronage is not how the software industry has traditionally worked, and the terminology and tools that developers have access to are not well-suited to the task.

There are further drawbacks to a subscription approach, as well. Subscriptions to various apps and services can add up and are harder to mentally keep track of than one-time purchases, leading to "subscription fatigue,"[63] or even people paying for subscriptions to things they no longer use. Subscriptions can be abused, as well: App stores have faced a problem with scam apps that prey on unwary users by

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[62] Brent Simmons, *One Advantage of the App Store That's Gone*, INESSENTIAL (June 20, 2020), https://inessential.com/2020/06/20/one_advantage_of_the_app_store_thats_gon.
[63] *See 'Subscription Fatigue': Nearly Half of U.S. Consumers Frustrated by Streaming Explosion, Study Finds,* VARIETY (March 18, 2019), https://variety.com/2019/digital/news/streaming-subscription-fatigue-us-consumers-deloitte-study-1203166046.

offering a "free trial" for a basic app (say, a weather app, or a voice memo recorder), but that auto-renews at an absurd rate, such as $50/week. Subscription abuse of this kind is an unintended consequence of app store design decisions, and one that, due to the cut off the top that the platform takes, platforms actually profit from.

In-app purchase requirements can limit developer flexibility and revenue

Yet another business model that is enabled by app stores—and also, to an extent, forced on developers, given pricing constraints—is the use of in-app purchases to unlock new features. Under this approach, the basic app can be free or low-cost, and advanced functionality can be unlocked with further payments. This allows for a degree of beneficial price discrimination—only "pro" users need pay for pro features that only they would use—and allows for new features to be presented as new in-app purchases. However, this approach also has many limitations and drawbacks. Software applications sometimes need to be rewritten or rearchitected to make them more expansible, to increase performance or as the result of major platform technology transitions. Such a rewritten app may make sense as a paid upgrade, even if it has no new customer-facing features, but it's not feasible to offer "rewritten app" as an in-app purchase. Determining which, if any, features can even be logically separated out as an in-app purchase may be difficult or impossible, and it is likely not possible to keep selling new in-app purchases to a single customer indefinitely, even if that same customer would happily pay an upgrade every 18 months or so for an important tool.

In-app purchases have also led, unfortunately, to the rise of abusive business models—games with addictive casino-like mechanics like loot boxes, for example, take advantage of human psychology and prey on children to encourage users to continually spend to keep playing. And while in-app purchases may be a good way for players to unlock additional game content that doesn't affect the fundamental nature of the game (such as cosmetic features like new outfits or more levels of play), far too many games employ "play-to-win" mechanisms where they cannot reasonably be completed unless users purchase in-app "gems" or weapons or other content—a fact which is usually not apparent to users before they invest time in playing a game. The abuse of in-app purchases, which unscrupulous developers and platforms alike both profit from, shows that the design and policies of app stores can not only encourage some business models while discouraging others, but can also negatively impact users directly.

In-app purchases are also at the heart of one of the main ways that app stores constrain developer business models—platforms, to varying extents, require that developers use platform-provided payment systems in order to conduct sales, from which they (at least, both Apple and Google) take the same 30% cut as they do from paid apps.

At a high level, this is not necessarily objectionable: If app stores take a 30% cut from the sale of paid software, but allow in-app purchases to be provided by any means, then many apps that are not paid might simply switch to a "free" (to download) model, with most app functionality locked behind a credit card purchase. At the outset, this could annoy customers, as platform-provided in-app purchases use a customers' saved payment information and do not require the inconvenient, and potentially risky from a privacy and fraud standpoint, entry of payment information. Also, while it is fair to argue about the exact rates, it is reasonable for an app store to earn a return, or at least cover costs, instead of simply being a file host for developers. The question then is not the existence of in-app payment rules, but what those rules apply to.

Here, the differences between the leading mobile app stores, Google Play and the iOS App Store, are salient. Both require that developers use the platform payment system for app features such as game levels, additional tools and features, and so forth. Neither of them requires that the in-app purchase system be used for payment for physical goods and services. But Apple, and not Google, does require that the in-app payment system be used for media purchases and subscriptions. Apple views these as more akin to app features than physical goods. Thus, while Amazon can sell you a paper book via its app without giving Apple a 30% cut, it cannot sell you a Kindle book the same way. To buy a Kindle book, you must go to a web browser or some other device without such a restriction. Similarly, Netflix or Hulu cannot sign customers up for new subscriptions in their apps using their own payment systems—they either must pay Apple the commission, or simply allow users with existing accounts that they have created elsewhere (e.g., on the web) to sign in, and hope that new users don't find this confusing.

These rules can seem arbitrary, even confusing, to developers. According to one developer:

> If we wanted to launch, we had to disable a part of the app that allowed Tech Top 10 users to preview The Information articles and subscribe to read them. The reason: our The Information subscription—which is a separate subscription from the Tech Top 10 —doesn't go through the App Store. I knew that to sell the Tech Top 10 app through the App Store, we had to use the App Store payment method. But I didn't realize how far Apple's grip on commerce went. [64]

The enforcement of this requirement can seem quite severe, as not only are developers required to use in-app purchases if they offer any in-app payment system at all, they are also forbidden from informing customers of alternatives (e.g., subscribing on a website).

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[64] Jessica E. Lessin, *Inside Our App Store Ordeal*, (December 9, 2019), https://www.linkedin.com/pulse/inside-our-apple-app-store-ordeal-jessica-e-lessin.

This developer limitation carries profound competitive implications, as Apple itself competes in many media and digital services markets. It sells music and music subscriptions; TV and movies as well as a video subscription service; ebooks; and even cloud storage. In all of these markets, Apple can offer in-app payments without paying 30% to some third party, and none of its competitors can. (In fact, Apple prevents apps from even directing users to a web browser to purchase a subscription. If they don't offer an in-app purchase, they simply have to be silent on how a user might sign up.) This allows Apple to give its own media apps and digital services an advantage in the marketplace and enables it to achieve success for reasons other than their merits.

Analyst Ben Thompson offered the following analysis of this issue:

> To put it another way, Apple profits handsomely from having a monopoly on iOS: if you want the Apple software experience, you have no choice but to buy Apple hardware. That is perfectly legitimate. The company, though, is leveraging that monopoly into an adjacent market — the digital content market — and rent-seeking. Apple does nothing to increase the value of Netflix shows or Spotify music or Amazon books or any number of digital services from any number of app providers; they simply skim off 30% because they can.
>
> To be clear, Apple absolutely did create the modern app marketplace, and, as the company loves to brag, an entire new economy full of new types of jobs. That, though, is precisely the problem: the App Store is not a fun side diversion; it is one of the largest platforms we have ever seen, on which hundreds of thousands of people are seeking to build real businesses, and that carries different types of responsibilities — and legal limitations — than an OS feature. It is bad for society generally and, I strongly believe, illegal for Apple to have crafted App Store rules such that it can leverage its smartphone share into monopoly profits on digital goods and services that are on iOS not because iOS is anything special, but because that is the only possible way to reach nearly 50% of the U.S. population.[65]

Compounding this issue, Apple has recently begun interpreting its rules even more strictly—instead of just requiring that, if there is an in-app purchase functionality at all, that it use Apple's system, but *requiring* that some kinds of apps offer in-app purchase functionality, when they would otherwise prefer not to. While this policy

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[65] Ben Thompson, *Antitrust, the App Store, and Apple*, STRATECHERY (November 27, 2018), https://stratechery.com/2018/antitrust-the-app-store-and-apple. From the perspective of this paper whether or not Apple's behavior is "illegal" is irrelevant; the question is whether it would be broadly beneficial if it changed its practices.

change has been in place for some time, it recently has received more attention due to a dispute regarding Hey, a premium email service from Basecamp.[66]

Rule 3.1.3(a) of the App Store review guidelines state:

> Apps may allow a user to access previously purchased content or content subscriptions (specifically: magazines, newspapers, books, audio, music, video, access to professional databases, VoIP, cloud storage, and approved services such as classroom management apps), provided that you agree not to directly or indirectly target iOS users to use a purchasing method other than in-app purchase, and your general communications about other purchasing methods are not designed to discourage use of in-app purchase.[67]

Apple has begun to interpret that rule as *only* applying to the app categories that are specifically listed, and disallowing other categories of app from offering "reader" functionality. Thus, while Amazon is free to allow Kindle users to access Kindle books purchased on the Amazon website inside the Kindle app, Apple has told the developers of Hey that if Hey can only function with a paid subscription, that it *must* offer iOS users the ability to purchase one from within the app, paying Apple 30%.[68] (When pressed on how inconsistently it appears to apply this rule—for example, it is not applied to the Gmail app, even though GSuite, like Hey, is a paid email service, Apple claims to be applying a "business vs. consumer" distinction which is not found anywhere in its app review guidelines.[69]) It goes further than even taking a cut of transactions that happen on a platform to *require* that transactions take place that otherwise would not, or to require apps to offer new features or functionality in order to be listed on an app store. (Hey has since changed its iOS app to offer a free option, meaning that Apple no longer requires it to offer an in-app purchase for subscription plans.[70])

Putting aside the fact that the app store may be the sole way to get software onto a device, it does not seem unreasonable for Apple or Google to require that apps use their billing systems for in-app purchases of genuine app functionality, such as

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[66] Nick Statt, *Apple Doubles Down on Controversial Decision to Reject Email App Hey*, THE VERGE (June 18, 2020), https://www.theverge.com/2020/6/18/21296180/apple-hey-email-app-basecamp-rejection-response-controversy-antitrust-regulation.
[67] Apple, *App Store Review Guidelines*, https://developer.apple.com/app-store/review/guidelines.
[68] David Heinemeier Hansson, https://twitter.com/dhh/status/1272976901762478080?s=21 (June 16, 2020).
[69] John Gruber, *The Flimsiness of 'Business vs. Consumer' as a Justification for Apple's Rejection of Hey from the App Store for Not Using In-App Purchases*, DARING FIREBALL (June 16, 2020), https://daringfireball.net/2020/06/hey_app_store_rejection_flimsiness. There may be a broad difference between software and services that are usually purchased in bulk by employers for their employees, and ones that are usually purchased by individuals for their own use, but there is likely so much overlap between those two categories that attempting to embody this in app store rules would lead to unintended outcomes.
[70] Jason Fried, Apple, Hey, and the Path Forward (June 22, 2020), https://hey.com/apple/path.

application features, game levels, or feature unlocks of various kinds. That is, if a feature could have been offered via a single up-front purchase, but the app instead is a free download with premium features locked behind an in-app purchase, requiring that those features use the app store's payment system seems like a reasonable way to avoid a form of arbitrage, where apps are "free" but unusable until a user pays using a third-party billing system. Instead, requiring that software features be available via a platform's in-app purchase system allows for apps to provide basic functionality for free, or work analogously to free trials, depending only on consumer demand, instead of a desire of developers to avoid paying a 30% cut of sales.

But this does not mean that digital content purchases in an app, or subscriptions associated with an app, should require a 30% payment to the platform maintainer. In-app purchase rules around software functions simply preserve the integrity of the app store as a retail store, but retail stores do not typically take a percentage of later purchases or subscriptions relating to a product they sell. For example, if Best Buy sells a Kindle, it doesn't require that Amazon pay it 30% of the proceeds of books purchased on that device, or if it sells a Nintendo Switch, it doesn't require that Nintendo use a Best Buy-provided payment system for subscriptions to Nintendo Switch Online.[71]

As mentioned above, Apple's practices in this area are under investigation by both the European Commission, as well as the House Subcommittee on Antitrust. This issue will be discussed further as it relates to Spotify's specific complaint, as well as in the section on policy recommendations.

Censorship and curation

App stores have effectively unlimited "shelf space," but for various reasons, they are selective about what apps they will actually carry. As discussed above, one of the most useful functions that app stores provide is preventing (or trying to prevent) harmful software from being distributed. This can include software that is harmful to a user's device, violates privacy, or is simply fraudulent. However, app store curation can go far beyond that.

One kind of curation is moral. App stores typically do not want to carry apps whose primary purpose is to access or display explicit sexual content and may restrict

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[71] In part, app stores being far more restrictive than traditional retail stores may relate to customers, and sellers, have other options. To be sure, alternatives to the app store such as sideloading could be one way of ensuring that the cut taken by the store owner is not excessive. However, even in a world where all the major platforms supported sideloading, competition and consumer protection issues are still at play, since sideloading, even on platforms that support it, is inevitably more difficult for users than just relying on the default app store.

violent and even "controversial" subjects, as well. This is unsurprising; mainstream brick-and-mortar retail stores also typically exclude such content. Even so, this kind of restriction raises some issues. First, of course, much of the content that app stores want to exclude for moral or taste reasons is, in fact, lawful content that adults have a constitutional right to produce and access. This doesn't just mean pornography—app store policies will generally exclude content (at least of a sexual nature, or content touching on controversial subjects) that is commonly found in R-rated films or in literary novels. But Best Buy or Target refusing to stock something doesn't mean that no one can get it elsewhere. These retailers are merely serving as curators, and consumers have other choices. But when an app store that is the only possible way to access certain kinds of content (say, a game) refuses to carry something, it can look more like censorship than curation. That being said, few people complain that app stores have policies designed to exclude hateful or harassing content, even though such content is generally lawful and protected by the First Amendment. The question for most people is not whether there should be some sort of curation, but where to draw the line.

There are practical difficulties, as well. The same platforms that operate app stores often also operate services that sell or stream music, movies, and books. They are typically far less prudish with respect to what media of this kind they will carry than with apps. Why the difference? It could be that a publisher, a record label, or movie studio will be the entity seen as directly responsible for the content — in other words, not the retailer — but nevertheless, the inconsistency in the kinds of material that creators can produce in one medium and not another seems unsustainable.

Additionally, apps that access online content are sometimes held to be responsible for that content, but the basis for this is somewhat confusing, and it is hard to fashion a one-size-fits-all rule. For example, the maker of a dictionary app was rejected from the app store because it could access databases that provided definitions for "urban slang,"[72] which seemed questionable, but it is hard to argue with Apple taking down the Tumblr app from the app store for that service's failure to remove child pornography.[73] Apple requires Reddit clients to block adult content by default, unless users opt into that account in their Reddit account settings, on the Reddit website (apps themselves are not allowed to offer such a setting).[74] At the same time, Apple's own Safari web browser can access any material that is posted online and does not block it by default. There may be no completely straightforward way for a platform maintainer to both preserve a family-friendly

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[72] Rik Myslewski, *Apple Denies Censoring App Store Swear Words*, THE REGISTER (August 6, 2009), https://www.theregister.co.uk/2009/08/06/apple_denies_dictionary_censorship.
[73] Jon Porter, *Tumblr was Removed from Apple's App Store Over Child Pornography Issues*, THE VERGE (November 20, 2018), https://www.theverge.com/2018/11/20/18104366/tumblr-ios-app-child-pornography-removed-from-app-store.
[74] Nicolas Deleon, *Apple is Cracking Down on NSFW Content Inside Reddit Apps*, MOTHERBOARD (April 12, 2016), https://www.vice.com/en_us/article/78k8yb/reddit-ios-apps-disappear-nsfw-content.

app store while allowing apps that can access internet and user-generated content, but it does not seem unreasonable to ask app stores to be transparent as to their reasoning and to treat similar apps similarly.

Restrictions on apps that touch on "controversial" topics are, in many ways, more troubling than app restrictions on salacious or sexual content. A few examples will be discussed below.

App stores may also refuse to carry entire app categories. Apple will not carry apps that it feels are used to facilitate copyright infringement, for instance, such as BitTorrent clients and retro game emulators, even though both of those app categories are capable of, in the Supreme Court's phrase, "substantial noninfringing uses."[75] Apps that download and install executable code are also prohibited by Apple. In fact, Apple's rules used to be much stricter, prohibiting even *interpreted* code—a prohibition which made many categories of apps difficult or impossible to implement, such as educational and programming apps, and which severely limited the functionality of advanced apps that use scripting to enhance and automate their functionality. Apple has since relaxed these rules, which now state that:

> [A]n Application may not download or install executable code. Interpreted code may be downloaded to an Application but only so long as such code: (a) does not change the primary purpose of the Application by providing features or functionality that are inconsistent with the intended and advertised purpose of the Application as submitted to the App Store, (b) does not create a store or storefront for other code or applications, and (c) does not bypass signing, sandbox, or other security features of the OS.[76]

However, it is worth considering exactly why Apple would ever put so much effort into what may seem to the outsider like a seemingly arbitrary retraction. It is because, having put certain restrictions on what it carries in the app store, and instituting a process for approving apps, it then had to think of ways its policies might be circumvented. Allowing apps to change their functionality via downloaded code is one such way. But if, as discussed below, the app store was not the *only* way to distribute apps to iOS devices, the incentive for developers to attempt to skirt the rules may be lessened.

Customer ownership, resale, and preservation

One drawback of app stores and related platform rules is a feature of DRM generally: It interferes with basic consumer rights, including the right to resell or transfer property.

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[75] *Sony Corp. of America v. Universal City Studios*, 464 U.S. 417, 428 (1984).

[76] This user comment from Hacker News gives the history of this. DerekL (July 20, 2017), https://news.ycombinator.com/item?id=14809096.

In the first place, despite what app store terms and conditions (and confused judges) might say, customers purchase copies of apps—not mere "licenses." This is because customers usually own the devices where the apps are saved. Copyright law defines a "copy" as a "material object,"[77] meaning that whoever owns the material object, owns a copy of whatever copyrighted work is embodied on that material object. A person who owns an iPhone owns a copy of iOS, and a copy of the various apps installed on the phone, in the same sense that a person who owns a vinyl record owns a copy of an album, or a person who owns a video game cartridge or disc owns a copy of the game. This ownership is, of course, distinct from ownership of intellectual property rights, and many of the uses that a copy owner can put a copy to do not require permission of the underlying rightsholder. While software industry lawyers attempt to confuse this issue, no flurry of EULAs, terms of service, licenses, and contracts can rewrite the basic terms of the Copyright Act.

When customers purchase a copy of an app, they also receive a license—that is, permission to use the app and make new copies of it in certain circumstances. However, customers do not need permission to run software they own a copy of, just as a reader doesn't need a license to read a book.[78] Additionally, under the first sale doctrine, users do not need permission to transfer copies of software they lawfully own (in the case of mobile devices, the copies are typically stored in the device's memory). However, there are caveats to this. While a license is properly defined as permission, not a contract,[79] some of the terms of something styled as a "license" may function as contract conditions. While a contract cannot redefine legal realities (e.g., transfer a sale into a "license"), people can give up legal rights they would otherwise have via contract. Additionally, apps being tied to specific user accounts via DRM, the anti-circumvention provisions of the DMCA, as well as the fact that a customer's right to transfer a copy of software refers to just that—the right to transfer a copy, not to make a new copy and then delete the old one—puts practical and legal difficulties in the way of any consumers who might want to avail

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[77] 17 U.S.C. § 101.

[78] Courts have (probably wrongly) held that executing a software program, which copies portions of the program into a computer's RAM from its permanent storage, implicates the reproduction right in copyright. However, 17 U.S.C. § 117, though initially designed to cover the *installation* of software on a device, not its use, also applies these "RAM copies" and states that any "new cop[ies]…created as an essential step in the utilization of the computer program in conjunction with a machine" are noninfringing provided the user owns a copy of the computer program. By attempting to assert that customers do not actually own material objects (copies of software) that they plainly do own, software industry legalese attempts to render 17 U.S.C. § 117 inapplicable, meaning that customers need a license to make RAM copies—to actually use software they paid for—and provides the opportunity to place conditions on that license. Strongly asserting that users do in fact own material objects such as phones thus carries the implication that they don't need a license to merely use software, or to transfer copies, but only to do things that actually would otherwise infringe on the exclusive rights of a copyright owner.

[79] Lawyers and even judges are not generally very clear about this. A contract that grants a user a license may simply be called a "license" or a "license agreement."

themselves of the resale and transfer rights (codified in the first sale doctrine) that are traditional with most forms of media and software. That said, customers do at least retain the basic right to sell or give away their devices—thanks to the first sale doctrine, the fact that those devices embed copies of software does not by itself interfere with this.

None of this changes the fact, though, that customers effectively cannot resell individual apps. Nor can they even transfer entire accounts. It's not even possible to meaningfully leave a digital account to your children or spouse after you die—while it is possible to give them your user name and password, platforms typically provide no way to merge an existing account and its various purchases with another account, meaning that perhaps thousands of dollars of purchased apps (as well as music, movies, books, and other media) simply vanish at the time of one's passing. Imagine if a person's library of books just vanished into a puff of smoke when they died, and couldn't enrich and educate future generations. This is the reality of app stores.

Similar issues stand in the way of software preservation. Software, unlike most other forms of media, is tied to particular platforms (both hardware and software) and these platforms change, become obsolete, and are even forgotten. App store terms, legal restrictions, and practical challenges stand as obstacles in the way of archivists, librarians, avid fans, and historians who might want to preserve apps as cultural and historical artifacts.

Single target for scams

Any time you make a single source the only place where a user can access apps—or anything else—you set up that source as a target for bad actors. This has happened on app stores, as persistent bad actors are able to get harmful apps past app review, or even to change the nature of their app after it has been approved.

One common scam involves apps that use deceptive user interface patterns to trick users into "agreeing" to expensive subscriptions that offer no useful functionality.[80] Even when it comes to apps that are not, strictly speaking, scams, it is common for top-grossing apps to offer functionality that is already built-in to the phone or

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[80] *See* John Gruber, *Gaming the App Store*, DARING FIREBALL (December 3, 2018), https://daringfireball.net/linked/2018/12/03/barnard-game-app-store, https://www.forbes.com/sites/johnkoetsier/2018/10/04/app-scams-cheap-utility-apps-are-stealing-260-2500-or-even-4700-each-year-per-user/#5d5f91ee162a.

available for free elsewhere.[81] Platform maintainers are aware of these problems and seek to curb them,[82]even though it is true that they profit from them, as well.

Apart from the financial harm caused by scam in-app purchases or subscriptions, and even though apps are limited in the damage they can cause by sandboxing and other protections, they can still attempt to exfiltrate user data (e.g., by tricking users into enabling location tracking, or entering passwords that they then capture) in ways that are hard to solve through purely technical means. While these problems are not unique to app stores, the lack of user options means that problems on the app store are all the more serious, and a lack of competition between different sources of apps may limit the incentives of the platform owner to improve matters.

Exclusion of certain markets

For any number of reasons, a platform might not offer services, or only a subset of services, in a given country. When app stores are the sole way to install software on a device, this leaves people with nowhere else to turn for what may be basic categories of apps.[83] While the details of national content laws, trade sanctions, and other matters are beyond the scope of this paper, people in the United States and other developed countries sometimes do not appreciate the extent to which the availability of digital services—including app stores—varies globally.[84]

App store tradeoffs may not be the best for all users

App store policies can constrain what apps can and can't do. Even if you assume that the policies that app stores adopt correctly balance security, convenience, and functionality for most users, there will always be a category of user who is willing to make different tradeoffs. For example, it might make sense to prevent apps from over-aggressively tracking a user's location, as this could both be bad for privacy or the device's battery life. But there may be situations where an informed user is aware of these tradeoffs but is still willing to take them. The one-size-fits-all approach of app stores that are the sole source of software on a platform can limit a device's usefulness for some category of user, with switching costs, network effects, and other factors making it difficult or impossible for a user to just switch to

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[81] Sarah Perez, *Sneaky Subscriptions are Plaguing the App Store*, TECHCRUNCH (October 15, 2018), https://techcrunch.com/2018/10/15/sneaky-subscriptions-are-plaguing-the-app-store/.
[82] Dami Lee, *Apple Adds Extra Step to App Store Subscriptions to Prevent Scams and Accidental Purchases*, THE VERGE (April 12, 2019), https://www.theverge.com/2019/4/12/18307785/apple-ios-subscription-confirmation-scam-accidental-purchases.
[83] Bryan Pon, WINNERS & LOSERS IN THE GLOBAL APP ECONOMY, Farnham, Surrey, United Kingdom: Caribou Digital Publishing (2016).
[84] *See* Apple Support, Availability of Apple Media Services, https://support.apple.com/en-us/HT204411#latam-car.

another platform. Here, as in many situations, the problem isn't the choices the app store makes per se, but the lack of alternatives to the app store, that can create consumer harm. Even if the app store allows for some flexibility, the power of defaults selected by a dominant app store will have outsized influence.

Case Studies

Specific instances of behavior where app store policies have harmed competition, or reduced user choices, can be more instructive than generalizations. This section will list a few illustrative examples. They are not intended to be exhaustive or present the most extreme or egregious cases of app store practices gone wrong. Some of the issues discussed may have even been resolved. These examples, instead, are intended just to provide context and to show that the proposals given here are intended to solve real-world problems.

Duplicating built-in functionality and defaults

Early in the life of its App Store, Apple didn't allow third-party apps that competed with its built-in apps at all. Apple rejected the apps for "duplicat[ing] built-in functionality" of the phone. Thus, third-party email and podcast apps[85] weren't allowed on the store at all. They couldn't compete on the app market, much less compete on an even playing field. Eventually, this restriction was lifted, but other restrictions remain.

For instance, third-party browsers cannot use their own rendering engine—the part of a web browser that actually decodes and displays HTML, CSS, and JavaScript. Instead, they are mere user interface wrappers to iOS's built-in rendering engine. Apple cites security and performance reasons for this, and there likely are concerns in these areas. Nevertheless, the restrictions prevent third-party browsers from competing with Apple's built-in Safari browser through greater compatibility with sites or higher performance, limiting them to offering different user interface choices, different syncing options, and other more superficial features.[86]

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[85] Chris Foresman, *Apple Rejects Another App For "Duplicating Functionality,"* ARS TECHNICA (September 22, 2018), https://arstechnica.com/gadgets/2008/09/apple-rejects-another-app-for-duplicating-functionality; Robert Palmer, *App Disqualified From App Store Because It 'Duplicates Itunes Functionality,'* ENGADGET (September 12, 2008), https://www.engadget.com/2008/09/12/app-disqualified-from-app-store-because-it-duplicates-itunes-fu.

[86] Additionally, even in its browser, Apple makes some choices it justifies in the name of security and privacy, that some developers see as impeding competition and user functionality—for example, the ability of web pages to create persistent local storage can be seen as an attempt to unfairly privilege native apps over web apps. *See* Aral Balkin, *Apple Just Killed Offline Web Apps While Purporting To Protect Your Privacy: Why That's A Bad Thing And Why You Should Care*, ARAL BALKIN BLOG (March 25, 2020), https://ar.al/2020/03/25/apple-just-killed-offline-web-apps-while-purporting-to-protect-your-privacy-why-thats-a-bad-thing-and-why-you-should-care. Browser competition would allow different

Further, while Apple is reported to be considering changing its policy here, it is not possible to set third-party apps as defaults. This means at least three things: First, third-party apps cannot be set as the defaults for certain kinds of URLs. Web URLs (that begin with http:// or https://) open in Safari. Mail URLs (mailto://) open in Apple Mail or, if that app has been uninstalled, nowhere.[87] (According to Phillip Shoemaker, who oversaw the Apple's app store approvals from 2009 to 2016, this is because Apple is worried that companies like Google or Facebook would promote apps to replace core iPhone functions like calling and messaging.[88])

Second, iOS provides certain functionality of its built-in apps to third-party apps as an API: For instance, a user might be able to send an email via an Apple Mail compose sheet. It is not possible to replace this functionality systematically. Third, Siri—which itself cannot be replaced with a third-party voice assistant, unlike Google Assistant on Android—uses certain apps as its default. For example, if a user says, "Make a note that says, 'Buy some milk,'" the note will be created in Apple's Notes app. If a user says, "Play music by Bob Dylan," Siri will try to use Apple Music. It is possible to use third-party apps but only if you specify the app's name for each command ("Play music by Bob Dylan in Spotify"), which may seem like a small inconvenience but is enough to discourage users from using the feature at all.

Finally, there is the simple issue that Apple preinstalls its own apps and increasingly advertises them to users in various parts of its software—particularly those apps that generate subscription revenue. It is hard, especially for mass market apps, to compete with built-in offerings. It is probably going too far to suggest that there should not be built-in apps at all. Devices should have certain built-in capabilities over time, and user expectations about what those should be might expand over time. But it's one thing to say that a phone should come with a built-in browser, calculator, or email app, and quite another thing to say that there should be a built-in, highly preferenced music streaming app or video service. Where to draw the line (and how to draw it) may be a hard question, but this doesn't mean there shouldn't be a line.

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browsers to make different choices, with Apple able to make the privacy choices it does without being under a cloud of suspicion of anticompetitive motives.

[87] Apple allows users to "uninstall" certain default apps, and "redownload them" from the app store, but in reality, the code for the apps in question is always on-device, just hidden. So "uninstalling" these apps does not actually free up any storage space.

[88] James Vincent, *Apple's Former App Approval Chief Says He's 'Really Worried' About Company's Anticompetitive Behavior*, THE VERGE (May 29, 2019), https://www.theverge.com/2019/5/29/18643868/apple-app-store-approval-process-antitrust-phillip-shoemaker-interview.

Spotify, and the required use of in-app purchase system for non-app content

As touched on above, one of the most significant controversies over in-app purchases in app stores is Apple's requirement that they be used not just for application functionality (such as extra game levels, additional processing tools in graphics apps, and so on), but for media purchases and digital subscriptions[89] as well. To be sure, these things fall somewhere between real-life goods and services and app features. Calling an Uber or buying batteries on Amazon seem like clear examples of real-life services, and with these, Apple and Google both allow developers to provide their own payment processing.[90] However, Apple categorizes things like music streaming subscriptions as more like app features, while Google categorizes them as more like services like ordering an Uber.[91] But if developers can sell users a music CD without paying the platform 30%, they should be able to sell music downloads the same way—Google's policy seems more developer-friendly and straightforward.

Spotify, in particular, has drawn attention to the ways that Apple's app store policies preference its service, Apple Music, at the expense of consumer choice. Spotify's Daniel Ek has laid out the changes he believes Apple should make:

- *First, apps should be able to compete fairly on the merits, and not based on who owns the App Store. We should all be subject to the same fair set of rules and restrictions—including Apple Music.*
- *Second, consumers should have a real choice of payment systems, and not be "locked in" or forced to use systems with discriminatory tariffs such as Apple's.*

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[89] Apple requires that apps and services like Dropbox, Microsoft Office 365, and Adobe Creative Cloud use its in-app purchase system for subscriptions. It may not be straightforward to determine whether a service is closer to unlocking actual app functionality or not, but a company in Apple's position should likely err on the side of permissiveness and treat digital services such as cloud storage (or, for example, domain name registration) as not requiring use of its IAP system, since they offer functionality which is useful outside of the app itself. A harder question is whether games that require or allow some form of continuing payment that could not have been offered via a single, up-front purchase should be required to use the in-app purchases system.

[90] Apple does now allow Apple Pay to be used for these kinds of purchases, though it is not required. Apple Pay is just a normal payment service like PayPal or Venmo that can be used in apps and in the Safari browser, or in real-life stores, and is distinct from the in-app purchase system, which uses the billing infrastructure originally designed for iTunes.

[91] Google, Developer Policy Center, Monetization and Ads, https://play.google.com/about/monetization-ads.

- *Finally, app stores should not be allowed to control the communications between services and users, including placing unfair restrictions on marketing and promotions that benefit consumers.*[92]

The first request would be mostly realized by implementing the other two, which are more concrete. Specifically, he argues that Spotify should be able to provide its own payment processing for in-app subscriptions, rather than having to use Apple's own. This practice would bring Apple in line with Google's policies, which allow media apps like Spotify's to bypass the in-app purchase system. He also believes that Apple should not be able to prevent apps from telling users where they can go to sign up for subscriptions.

Spotify's problem is magnified by the business it is in. Music subscription services pay out most of their revenue to rightsholders. They simply cannot afford to lose 30% of their revenue to Apple, and if they simply up their subscription rates to make up the difference, they risk becoming uncompetitive with Apple, whose own music service does not have to pay 30% to a third party.

This conflict of interest applies in other areas, as well. Customers cannot buy ebooks in the Kindle app on iOS, for instance, but they can in Apple's own Books app. Nor can Amazon direct users to the web, where they can purchase books which then appear in the app. The popularity of the Kindle store relative to Apple's ebook store shows that many consumers are aware of how to get around Apple's restrictions, but certainly many are not. And Apple does not even compete in some of the categories where its policies make it difficult to sell media purchases or subscriptions, such as digital comics—even though it is increasingly entering new categories, such as video streaming subscriptions. But even viewed from a consumer protection rather than a competition perspective, Apple's policies, at best, inconvenience users for reasons that are less than compelling. It doesn't even seem likely that they even generate much revenue for Apple, at least not directly, since many apps appear to simply lack in-app purchase functionality altogether rather than paying Apple 30%.[93]

Apple adds to this issue by not even allowing Spotify, Amazon, or any other app developer to provide a link to a web page for sign-up, or even explanatory text describing how to do so. Apps that require some sort of subscription to work, but that don't use Apple's in-app purchase system, are required to be black boxes: They don't work, and developers are not allowed to communicate to customers how to get

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[92] Daniel Ek, *Consumers and Innovators Win on a Level Playing Field*, SPOTIFY NEWSROOM (March 13, 2019), https://newsroom.spotify.com/2019-03-13/consumers-and-innovators-win-on-a-level-playing-field.

[93] Netflix used to have in-app purchases through Apple, but it stopped offering them to new customers, though existing subscriptions continue to work. YouTube TV recently decided to cancel all in-app iOS subscriptions, requiring users to re-subscribe through alternate means.

them to work. If the app even links to a web page for unrelated reasons (for example, a privacy policy, or a password recovery form), and it is possible to tap on a logo and be taken to the developer's home page, where there is a sign-up form, Apple, will reject the app. Customers might be able to figure out how to go to Spotify's website, or Netflix.com to sign up for a subscription, but it is easy to see how this policy disadvantages smaller apps without the same level of brand recognition.

Fortnite and the Google Play Store

Fortnite by Epic Games shows that it is difficult, even for popular apps, to successfully bypass an app store, even when the platform makes it possible. Specifically, on Android, to install Fortnite users used to be required to sideload—download the app from a web page an install it—rather than installing it from the Google Play Store.[94] Epic Games did this because Fortnite's entire business model is charging users for optional in-app items, such as costumes for their characters,[95] and it did not want to give Google 30% of each transaction. But the difficulty that ordinary users had in sideloading software meant that Epic Games eventually had to start offering the game in the Play Store regardless.[96] These events show that while sideloading remains an important way for certain kinds of apps to bypass app stores, and can be extremely valuable in some cases, by itself it does not provide a reason to avoid other scrutiny of app store policies.

Exclusive access to hardware features

A similar issue to a platform maintainer giving its own apps preferential treatment is when it gives its own hardware accessories access to platform features unavailable to other companies. For example, Apple's AirPods and Beats Headphones can not only set up and pair with Apple devices much more easily than third-party headphones can, but they can be immediately used with any of a user's other Apple devices without cumbersome unpairing/repairing steps. As Nilay Patel of The Verge has written, "There is literally no way for another headphone company to compete with the advantages Apple gives itself[.]"[97]

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[94] John Callaham, *Here's How to Install Fortnite for Android*, ANDROID AUTHORITY (April 17, 2020), https://www.androidauthority.com/how-to-install-fortnite-for-android-894001.
[95] Akhilesh Ganti, *How Does Fortnite Make Money?*, INVESTOPEDIA (March 27, 2020), https://www.investopedia.com/tech/how-does-fortnite-make-money.
[96] Nick Statt, *Epic gives in to Google and Releases Fortnite on the Play Store*, THE VERGE (April 21, 2020), https://www.theverge.com/2020/4/21/21229943/epic-games-fortnite-google-play-store-available-third-party-software.
[97] Nilay Patel, https://twitter.com/reckless/status/1188964589553143809?lang=en (October 28, 2019).

Tile, a company that makes hardware tracking tags, has similarly sounded the alarm about Apple's rumored competing product, which is likely to have access to iPhone features that Tile cannot match.[98]

Preferential treatment of important apps

At times it can appear that preferred or important developers get treatment from app stores not available to average developers.

For example, when Uber was caught not only violating Apple's privacy policies, but attempting to use location access to hide this behavior from Apple's app reviewers, instead of being kicked out of the App Store, Apple CEO Tim Cook called Uber CEO Travis Kalanick and told him to change it.[99] It is hard to believe that an app less important to Apple's platform would have gotten away with Uber's behavior with a scolding.

Some developers have noticed that the enforcement of rules against major companies and app developers is less exacting than against smaller companies. For example, The Information noted that "the rule that we couldn't require users to enter their email" applied to them, but not to Disney and the New York Times.[100]

A more recent example is Apple exempting Amazon for its in-app purchase rules for some video content because it is a "premium subscription video entertainment provider"—a category of provider that seems only previously to have included cable services.[101] This appears motivated by Apple's desire for video services to support Apple platform features like its video-aggregating TV app and AirPlay—but it remains to be seen whether smaller video service providers will win the same exemption from App Store rules as the major providers thus far covered.

Businesses cut special deals with preferred partners all the time, and certain apps (such as Uber, Netflix, Facebook, or YouTube) may be so important to a platform that they get more leeway than others, or at least more time to comply with rules and more flexibility in their interpretation. It is even rumored that some of them pay less than the 30% or 15% that Apple typically requires, though this has not

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[98] Adi Robertson, *Sonos and Tile Execs Warn Congress that Amazon, Google, and Apple are Killing Competition*, THE VERGE (January 21, 2020), https://www.theverge.com/2020/1/21/21070812/sonos-tile-basecamp-popsocket-congressional-hearing-amazon-google-apple-competition.
[99] Andrew Liptak, *Uber Tried to Fool Apple and Got Caught*, The Verge (April 23, 2017), https://www.theverge.com/2017/4/23/15399438/apple-uber-app-store-fingerprint-program-tim-cook-travis-kalanick.
[100] Jessica E. Lessin, *Inside our Apple App Store Ordeal*, (December 9, 2019), https://www.linkedin.com/pulse/inside-our-apple-app-store-ordeal-jessica-e-lessin/.
[101] John Gruber, *Amazon and Apple Strike Deal for Prime Video In-App Purchases and Subscriptions*, DARING FIREBALL (April 2, 2020), https://daringfireball.net/2020/04/amazon_apple_prime_video.

been publicly substantiated. If developers that did not get such treatment were able to reach customers without having to go through the App Store, e.g. through sideloading, this would be less of a competitive and fairness concern.

HKmap.live, and government pressure to censor

Last year, Apple removed an app called HKmap.live from the App Store in Hong Kong. This app allowed people to track the location of police during the civil unrest in Hong Kong. Apple attempted to argue that the app violated its policies, and violated local law, but neither claim could withstand the barest of scrutiny.[102] Yaqiu Wang from Human Rights Watch stated that this app removal "is just the latest incident of Apple caving to the Chinese government's political pressure."[103]

An even more recent incident involved Apple removing Pocket Casts and Castro, third-party podcast clients, from its App Store in China.[104] Podcast apps, like web browsers, simply access content that is available on the open web. They do, however, typically provide a directory of available podcasts. The makers of podcast apps, like browser developers, are likely to resist efforts to require that they restrict what content their users can access,[105] either by blacklisting URLs of certain podcasts or removing listings from their directory. But while independent app developers may be willing to simply forgo the Chinese market rather than comply with local laws they object to, large multinational companies like Apple are not likely to make that decision.[106] Indeed, instead of removing its own podcast app from the App Store in China, Apple simply removes "objectionable" podcasts from its directory in that country.

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[102] Maciej Ceglowski's Twitter thread explains why. Maciej Ceglowski, https://twitter.com/Pinboard/status/1182348757360234497 (October 10, 2019).

[103] David Crawshaw and Reed Albergotti, *Apple Pulls Police-Tracking App Used by Hong Kong Protesters*, WASHINGTON POST (October 10, 2019), https://www.washingtonpost.com/world/asia_pacific/apple-pulls-police-tracking-app-used-by-hong-kong-protesters/2019/10/10/4aad5ebe-eb14-11e9-a329-7378fbfa1b63_story.html.

[104] Sam Byford, *Apple Pulls Podcast Apps in China After Government Pressure*, THE VERGE (June 11, 2010), https://www.theverge.com/2020/6/11/21287436/pocket-casts-castro-china-apple-government-pressure. China is able to block the functionality of another major independent podcast app, Overcast, without having the app removed from the store. Overcast, https://twitter.com/OvercastFM/status/1271122252868784140 (June 11, 2020) ("Overcast's servers have been blocked in China for years, so it already didn't work.") Apple also has removed other categories of app from its store in China, such as Virtual Private Network (VPN) apps that allow users to bypass government internet restrictions.

[105] While most podcast clients, including Apple's, do not host podcasts themselves, some "podcast" clients, such as Spotify, do not actually offer access to podcasts on the open internet, but host audio files themselves in a proprietary system. Apps that choose to forgo the open internet in this way may be required to make decisions about what content to actually host, and where to make it available.

[106] Google did leave the Chinese market in 2010. That said, its business in China at the time was marginal, and it has since explored ways to reenter the Chinese market in ways that are consistent with the requirements of the Chinese authorities, via its now-terminated "Project Dragonfly." Wikipedia, "Project Dragonfly", https://en.wikipedia.org/wiki/Dragonfly_(search_engine).

Again, there are solutions to this. It is not necessary to look to companies to disobey what they view as unjust local laws, to ignore political pressure from local governments or, except in extreme instances, to simply decline to do business in certain countries at all. (Apple's position in China of course is more precarious since it not only sells billions of dollars of devices into the Chinese market, but depends on Chinese manufacturing and supply chains for its global operations.) Rather, a better approach is for companies to avoid putting themselves in a situation where they even can prevent customers from installing an app if they choose. One approach would be for Apple to outsource the operation of its services in countries where it might be subject to local pressure or laws that may be objectionable from its standpoint. But this is merely passing the buck. A better approach, to be discussed below, will be the often-mentioned sideloading, which would allow users to install apps without going through a centralized app store.

Apple, AT&T, and the FCC

When the iPhone was first released, it was available only on AT&T, in the United States. Voice-calling apps were not, at first, permitted to use an iPhones mobile connection—just WiFi. While the FCC generally has jurisdiction over phone carriers like AT&T,[107] it does not have direct authority over information services like the iOS app store. However, it came out that Apple only had this restriction in place under the terms of a secret agreement with AT&T,[108] and AT&T released Apple from this agreement after the FCC signaled its intention to subject wireless networks to some form of net neutrality rules.[109] This early app store controversy shows how the gatekeeper control that app stores enable can be used in ways that are contrary to the public interest, and even due to outside pressure on the platform maintainer itself. Clear rules of the road can not only protect users from platform maintainers but also from pressure put on platform maintainers from their business partners.

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[107] Leaving aside how the FCC under Chairman Ajit Pai decided to abdicate authority over broadband. *See* Lindsay Stern, *Two Years Later, Broadband Providers Are Still Taking Advantage of An Internet Without Net Neutrality Protections*, PUBLIC KNOWLEDGE (December 20, 2019), https://www.publicknowledge.org/blog/two-years-later-broadband-providers-are-still-taking-advantage-of-an-internet-without-net-neutrality-protections.

[108] Free Press, Press Release, *AT&T-Apple Deny and Confirm Blocking VoIP*, (August 21, 2009), https://www.freepress.net/news/press-releases/att-apple-deny-and-confirm-blocking-voip.

[109] Ryan Singel, *AT&T Relents, Opens iPhone to Skype, VOIP*, WIRED (October 6, 2019), https://www.wired.com/2009/10/iphone-att-skype/. Any reasonable legal regime would not distinguish between AT&T blocking a category of app at the network level, and it directing a third party to block a category of app from being installed on a phone to begin with.

Moral censorship

Apple is frequently subject to charges of censorship, including moral censorship, and it does apply strict standards to the App Store that are not applicable to its other content stores, where it sells movies, books, and music that touch on or feature the same subject matter that will get an app removed.[110] In an earlier version of its app store guidelines, Apple was forthright about this:

> We view Apps different than books or songs, which we do not curate. If you want to criticize a religion, write a book. If you want to describe sex, write a book or a song, or create a medical app.[111]

Some examples of this kind of content-based censorship (sometimes reversed, with the app put back after the developer makes some changes) include the removal of an app that featured the political cartoons of a Pulitzer Prize-winning artist,[112] a game about dealing with the government in a dystopian society,[113] an app that provides news about U.S. drone strikes,[114] and a strategy game about the Afghan war.[115] More recently, Apple removed all vaping apps from its store,[116] including apps that perform functions not possible on iOS without native iOS apps. As John Gruber wrote:

> The stuff about selling cartridges and sharing news — it's fine for that stuff to be out of the App Store because you can get it on the web. But Bluetooth stuff where apps were used as the interface for controlling hardware — web apps can't do that (nor should they be able to). There is no alternative to a native app, and native apps are only available on the App Store. This would be an

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[110] Jess Bolluyt, *Why Does Apple Censor its App Store but not iTunes?*, CHEATSHEET (April 26, 2016), https://www.cheatsheet.com/gear-style/why-does-apple-censor-its-app-store-but-not-itunes.html/.
[111] Leander Kahney, *Here's the Full Text of Apple's New App Store Guidelines*, CULT OF MAC (September 9, 2010), https://www.cultofmac.com/58590/heres-the-full-text-of-apples-new-app-store-guidelines/.
[112] Ian Paul, *Apple Rejects Pulitzer Prize Winner's App*, PC WORLD (April 16, 2010), https://www.pcworld.com/article/194387/apple_rejects_pulitzer_prize_winners_app.html.
[113] Kyle Orland, *Apple Reverse Decisions, Allows Unedited Papers, Please on iPad,* ARS TECHNICA (December 12, 2014), https://arstechnica.com/gaming/2014/12/apple-forces-nude-immigrants-to-cover-up-in-ipad-version-of-papers-please/.
[114] Louise Matsakis, *Apple's Long History of Rejecting 'Objectionable Content' From the App Store*, MOTHERBOARD (July 17, 2017), https://www.vice.com/en_us/article/a3dwq8/apples-long-history-of-rejecting-objectionable-content-from-the-app-store.
[115] Charlie Hall, *Afghanistan '11, Featuring US and Taliban forces, Removed from App Store*, POLYGON (December 6, 2018), https://www.polygon.com/2018/12/6/18128924/afghanistan-11-taliban-app-store-removed.
[116] Ina Fried, Mike Allen, *Exclusive: Apple to Remove Vaping Apps from Store*, AXIOS (November 15, 2019), https://www.axios.com/exclusive-apple-to-remove-vaping-apps-from-store-8669fd94-e92a-4ce4-a9e2-ce5afa598b67.html.

> easy call to make (and would have been made from the get-go by Apple) if vaping were illegal. But it's not illegal.[117]

There may be good reasons for consumers to criticize where Apple draws the line when it comes to content decisions, and the apparent double standard between apps and other media. At the same time, its decision to not host apps that feature genuine hate speech or pornography raises fewer objections. But, as with politically-motivated removals such as that of HKmap.live, sideloading is an escape valve.

Location data in iOS 13

Another example of where the privacy and security needs of users can come into tension with free and open competition relates to how apps can access location information on current versions of iOS. Previously any app could ask for permission to access this information, and users would be presented with a dialog box where users could allow the app to access location just once, while using the app, not to allow it—or to always allow it.

However, it has become apparent that allowing apps to track users in the background can have serious privacy implications,[118] and that many apps that ask for such access do not truly need it. Thus, Apple has changed iOS to make it more difficult for apps to track users. Developers have complained—in open letters and to Congress—that this, by itself, is anti-competitive. Some of the implementation details—specifically that Apple does not subject itself to the same rules it applies to outside developers—do have competitive effects that must be considered. But the privacy of users is also a legitimate concern, and the interests of developers as a whole should not take precedence over this, either.

Specifically, Apple has changed iOS so that apps cannot directly ask for always-on tracking. Users can activate it on a per-app basis in system settings, but apps themselves present a dialog box asking for location access for just one use, or while the app is in the foreground. The system also periodically prompts users to confirm their choice.

A number of app developers complained about this change, arguing that the new feature would confuse users, who would not be able to figure out how to enable location tracking, or understand why apps that require this functionality weren't working properly without it. Tile has argued that Apple requires users to re-confirm their choice too often, and that Apple has promised to bring back some form of an

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[117] John Gruber, *Apple is Removing All Vaping Apps from Its Store*, DARING FIREBALL (November 18, 2019), https://daringfireball.net/linked/2019/11/18/app-store-vaping.

[118] Jennifer Valentino-Devries, Natasha Singer, Michael H. Keller and Aaron Krolik, *Your Apps Know Where You Were Last Night, and They're Not Keeping It Secret*, NEW YORK TIMES (December 18, 2018), https://www.nytimes.com/interactive/2018/12/10/business/location-data-privacy-apps.html.

"Always Allow" prompt.[119] One coalition of developers added, "The changes also have the added effect of removing critical geolocation functionality while simultaneously not applying to Apple's own apps, some of which compete with the products we develop."[120] This is because when built-in iPhone functionality requires always-on tracking, Apple bypasses the app-based system of permissions entirely, and gives users instead buttons in a system settings area, which are by default set to allow tracking. For instance, Apple Maps does not even have an "always" option for location services—the most that users can give it is "While Using the App." Nevertheless, Apple tracks users at all times and gathers location information in the background on iPhones to improve Maps other services whether or not users actually use Apple Maps, or an alternative like Waze. Thus, Apple gains telemetry about traffic conditions—which improves Apple Maps—even from users who use a competing app, or who are not using a mapping app at all. The setting that controls this is found in the Settings app, under Privacy, then Location Services, then System Services (which is at the bottom of a very long list, which is otherwise alphabetical) and then, at the bottom of another long page of options, there is an "Improve Maps" button which is by default set to "on."

Certainly, some services require location access—such as "Emergency Calls and SOS," "Cell Network Search," and "Setting Time Zone" that do not raise any competitive implications, and having these services have access to location information by default is beneficial. Even so, this thin wedge should probably not be used as a justification for Apple to privilege any or all of its apps and services over those of competitors, or to rule out ways to limit the competitive harm that legitimate measures to improve user privacy and enhance device performance may cause.

Parental control apps

It is possible to install something called "profiles" on iOS devices that add features or functions not available to normal apps or that apply certain settings. One kind of profile for "Mobile Device Management" was designed for companies that issue their employees phones or otherwise need to have more centralized control over devices than iPhones and iPads allow off-the-shelf. As Apple describes it, "MDM includes updating software and device settings, monitoring compliance with organizational policies, and remotely wiping or locking devices."[121]

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[119] Diane Bartz, *Tile Says Apple's Behavior Is Anticompetitive And Has 'Gotten Worse, Not Better,'* REUTERS (April 1, 2020), https://www.reuters.com/article/us-tech-antitrust-apple-tile/tile-says-apples-behavior-is-anticompetitive-and-has-gotten-worse-not-better-idUSKBN21J72V?.
[120] Juli Clover, *App Developers Claim Apple's iOS 13 Location Tracking Changes Are Anti-Competitive*, MACRUMORS (August 16, 2019), https://www.macrumors.com/2019/08/16/app-developers-tracking-restrictions-ios-13.
[121] Apple, Support: Mobile Device Management Settings, https://support.apple.com/guide/mdm/mdm-overview-mdmbf9e668/web.

Third-party developers, however, realized that by using MDM profiles, they could offer parents a similar level of control over their children's devices. (As a technical matter, the app developer would become the manager of the child's phone and would then provide tools for the parent to access and control it.) For example, using such software, a parent might restrict whether and to whom a child can send messages.

Apple, however, claimed that it felt that this was a misuse of MDM. It stated:

> Over the last year, we became aware that several of these parental control apps were using a highly invasive technology called Mobile Device Management, or MDM. MDM gives a third party control and access over a device and its most sensitive information including user location, app use, email accounts, camera permissions, and browsing history. We started exploring this use of MDM by non-enterprise developers back in early 2017 and updated our guidelines based on that work in mid-2017.[122]

However Apple's timing raised eyebrows, as after seemingly tacitly tolerating apps that make these kinds of uses of MDM profiles on the App Store for some time, it began cracking down on them only after it rolled out its "Screen Time" feature, which offers similar functionality to many parental control apps.[123] Developers of such apps banded together to ask Apple to reverse course,[124] which Apple eventually did.[125]

These profile features raise several very nuanced issues. The fact is that MDM profiles can be a privacy and security risk if misused. MDM profiles are sometimes used by malicious actors to spy on people, and even by "stalkerware," which is software that is like parental control apps but that is used, for instance, by abusive spouses to track their partner's whereabouts and read their communications.[126]

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[122] Andrew Liptak, *Apple Explains Why It's Cracking Down on Third-Party Screen Time and Parental Control Apps*, THE VERGE (April 28, 2019), https://www.theverge.com/2019/4/27/18519888/apple-screen-time-app-tracking-parental-controls-report.
[123] Jack Nicas, *Apple Cracks Down on Apps That Fight iPhone Addiction*, NEW YORK TIMES (April 27, 2019), https://www.nytimes.com/2019/04/27/technology/apple-screen-time-trackers.html.
[124] Dieter Bohn, *Parental Control App Developers Band Together to Demand an API from Apple*, THE VERGE (May 30, 2019), https://www.theverge.com/2019/5/30/18646601/parental-control-app-developers-band-together-to-demand-an-api-from-apple.
[125] Sean Hollister, *After Outcry, Apple Carves Out Room for Rival Parental Control Apps to Exist*, THE VERGE (June 4, 2019), https://www.theverge.com/2019/6/4/18653142/apple-mdm-parental-control-screen-time-app-store-guidelines-update.
[126] Charles Osborne, *Apple Reveals Why App Store Parental Control App Crackdown Took Place*, ZDNET (April 29, 2019), https://www.zdnet.com/article/apple-refutes-anti-competitive-parent-control-app-claims-says-removal-was-for-security-user-privacy.

Additionally, Apple's competitive motives are not as straightforward as it might appear, because Apple does not actually *sell* Screen Time—it's included for free with iOS.[127] Rather, it seems like Apple chose to allow apps that may have technically violated the terms of the App Store until it was able to offer alternatives—a bait and switch that puts developer's livelihoods at risk, even if it did not have a straightforward financial motivation in terms of generating new sales of its own apps.

Apple's approach was essentially to continue to allow third-party MDM use for settings such as parental control apps, but to pledge to monitor them carefully. This solution though expedient at the time is not ideal, and there may be better solutions, as discussed below.

Solutions

This paper does not argue against the existence of app stores or controlled software platforms in service of some vision of openness, freedom and creativity. The benefits that app stores and controlled platforms create in terms of user trust, security, and privacy mean that the risks from gatekeeper controls they give to platform maintainers are worth tolerating. However, in the case of dominant platforms, certain policy changes can reduce those risks and benefit users and developers, without significantly undermining either the security and integrity of the platform, or the app store, nor a platform maintainer's incentive to invest in and maintain the store. Many of the solutions discussed here have already been hinted at above or follow straightforwardly from the descriptions of the problems they are intended to address.[128]

Sideloading

It is possible to preserve the benefits of a controlled app store without making it the only way to install software on devices. Alternate ways of installing software on devices would allow users to access software that is not available on an app store

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[127] You could say that Apple was attempting to entice people with older phones to upgrade to iPhones that support the version of iOS that includes Screen Time, rather than continuing to use older phones that may work with third-party parental control apps. This motivation cannot be discounted but is likely not what drove Apple's decision.

[128] As this paper was being finalized, Astropad, a company that sells software that allows iPads to be used as an external display on Macs, a feature which Apple itself now offers, published a blog post with recommendations that in some ways mirror the ones in this section. It calls for users to be able to set default app preferences, to open up alternate in-app payment options, to allow sideloading, to give third-party developers better equal access to APIs, and to "stop sherlocking third-party developers." Savanah Reising, *Dear Apple: Here's How to Stop the Antitrust Investigations* (June 16, 2020), ASTRO BLOG, https://astropad.com/dear-apple. However, as mentioned earlier, while being Sherlocked is not a pleasant experience for developers, this paper calls for guardrails to ensure fair competition, not an outright ban on platforms integrating new features into their core system.

due to content reasons, government censorship (e.g., podcast and VPN apps in China), or simply because the developer's business model is not a good fit with the app store.

Before the advent of app stores, "sideloading" is how all software was installed on computing devices—through installation disks, web downloads, and the like. On many platforms like Windows and macOS, it remains the predominant method of installing native software. However, for devices where the primary way of installing software is through app stores, these "old-fashioned" ways of installing software go by the name of "sideloading," coined by analogy to "uploading" and "downloading."[129] Sideloaded software may be installed any number of ways—via physical media, an internet download, "package managers" of the sort that are popular on Linux, like RPM and APT, or from another device (e.g., a phone connected to a PC via USB). The question isn't whether sideloading is possible or the best way to do it—it's how to preserve the security and curation benefits of app stores, and to preserve the incentives of platform owners to invest in their app stores, while still giving users and developers more freedom than a fully locked-down platform allows. A few real-world examples of how sideloading works on existing platforms will provide context for the recommendations to follow:

- *Windows*. Windows is a typical "open" platform where the distribution and installation of software was completely decentralized. In recent years, app store models have been introduced to varying degrees of success, however. Interestingly, third-party game stores, such as Steam, have been much more successful than Microsoft's own app store (which is simply called "Microsoft Store"). There are many reasons for this, including the kinds of apps that Microsoft allowed in the store in the first place Though the driving reason for the slow uptake of the Microsoft Store is probably (1) user habits, and (2) developers being unwilling to give Microsoft a cut of the sales of paid apps unless there was a truly compelling reason to do so, which the Microsoft Store does not provide.
- *macOS*. On the Mac, whose operating system has been variously named System Software, then Mac OS, then Mac OS X, and now macOS, has a similar historical situation as Windows. Users traditionally installed software from discs and internet downloads, and user and developer habits are hard to change. Apple, after its experience with iOS Apple also rolled out its own Mac App Store, and introduced new security features that apply for apps installed from outside the store, as well. Its "Gatekeeper" feature encourages apps to be code-signed, and certain features that at first were restricted to Mac App Store apps (such as iCloud connectivity) are now available to all signed apps. At the same time, the Mac still allows users to

[129] Wikipedia, Sideloading, https://en.wikipedia.org/wiki/Sideloading#Historical. "Sideloading" is a form of "retronym," like "acoustic guitar" or "dumbphone"—a new term needed to specify what used to be the default.

run unsigned apps—though they may have to click a checkbox in System Preferences, or right/two-finger click on an unsigned app and select "Open" the first time it is launched.[130]

- *Android*. Android has allowed sideloaded apps from the beginning, and it has received some usage, as the Fortnite situation discussed above demonstrates. However, sideloaded apps have no code-signing requirements, which is a potential security problem.

This paper has had to provide a lot of context and detail to get to specific, fairly straightforward suggestions, which are discussed below.

All general-purpose consumer computing devices should allow sideloading.

Many of the problems that app stores create become problems worthy of a policy response only because of their gatekeeper status—there is no way to install software onto a device except through the app store. While perhaps it may make sense to limit any actual legal or regulatory requirements in this regard to dominant platforms, giving users and developers the flexibility to make the most of their devices is sensible across the board.

This is not to say that *all* "computers" should have this capacity. While a few enthusiasts may desire exactly that, there is no pressing general user or developer need to allow people to install "apps" on their smart thermostats or alarm clocks. While limited-purpose devices such as these, or even gaming-specific devices, may improve by being more open, they do not rise to the level of public concern as dominant, general-purpose computing platforms.[131]

Allowing sideloading is not the only change that dominant platforms should make, nor—as we've seen with Android—does sideloading necessarily reduce the importance and potential abuse of a platform's default app store. Additionally, code-signing, automated malware checks, and even placing more stringent sandboxing restrictions on sideloading will still likely not provide the same security guarantees as app store reviews and will do not replicate the other curatorial functions that app

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[130] Several years ago, there was an interesting exchange between James Grimmelman and Jonathan Zittrain. Zittrain has been a critic of locked-down computing models and characterized the Mac App Store and its sandboxing requirements as the beginning of the end for the openness of the Mac platform. However, this model—where a single device has both a "safe" way to install software and a more open space—was called for a few years before by Zittrain himself. James Grimmelmann, *Zittrain vs. Zittrain*, THE LABORATORIUM (November 9, 2011), http://laboratorium.net/archive/2011/11/09/zittrain_vs_zittrain.

[131] Though there may even be good reason for game console platforms to allow certain sideloaded apps at a minimum, such as student or hobbyist programming projects. Additionally, consumer devices should not use software locks or contractual restrictions to limit repairs or resale, so even in that context, some level of openness is desirable.

stores perform, such as ensuring that software is useful, accessible, or even non-deceptive.

With these caveats, one can at least think of sideloading as an escape valve—available on an opt-in basis to users, for apps and situations where distribution through the app store or more formal channels is impossible or impractical. Finally, it is worth noting that a dominant platform itself can benefit from sideloading. Not only is a platform more valuable when users and developers are free to use the apps of their choice, the slight lessening of gatekeeper control that sideloading affords takes away some of the impetus to either use antitrust or common carrier-type regulation of app stores as a means of preserving user choice and developer access.

Mainstream devices should require code-signing of sideloaded apps

Many of the security benefits of app stores come from code-signing, the security technique that allows users to be sure that an app is from whom it purports to be from and has not been modified. (A more exacting form of code-signing is app notarization, where apps are first scanned by the platform provider before they can be signed.) As discussed above, Macs and Windows PCs traditionally do not require code-signing, though Macs encourage it. Android does not require it for sideloaded apps. However, requiring[132] code-signing is not just a good idea for platforms in general, it precisely addresses the specific potential shortcomings of allowing software to bypass an app store.

There should be multiple code-signing authorities

Code-signing does, however, reinforce the power of the platform in the sense that certificates still must be issued by some central authority—typically, the platform. To sign an app, a developer must be a registered Apple developer, and pay an annual fee. However, it doesn't have be this way. For example, on the web, multiple certificate authorities can provide the necessary authentication for encrypted websites.[133] A platform vendor does not have to be the only central authority allowing users to install apps and developers to sign them. Apple, for instance, could work with different organizations in the United States and around the world and design its devices to allow apps signed by them, as well. For example, a nonprofit organization like Mozilla might be able to issue certificates to some developers allowing them to sign apps,[134] or a government might allow its own apps to be signed under its own authority. Each one of these authorities could become a

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[132] At least by default. Devices could have a "developer" mode that allows self-signed or unsigned apps, provided it is not something that unscrupulous malware developers could somehow trick users into enabling.

[133] Wikipedia, Certificate Authority, https://en.wikipedia.org/wiki/Certificate_authority.

[134] The suggestion is not that Mozilla or some other organization allows apps to be signed with its credentials, but rather that it has the same power to issue new credentials as Apple.

chokepoint, and ultimately the platform vendor retains the power to decide which different code-signing authorities to recognize, and under what terms. However, diffusing power in this way can curtail abuse and, while not perfect, may be preferable to a system where a single entity decides what apps can be installed on user devices worldwide.

In-app purchase requirements should be limited to app functionality

The competitive issues with certain in-app payment rules have been discussed at length above. Provided sideloading is available as an option to allow developers with good reason to bypass the platform's default app store entirely, it is not objectionable for platform maintainers to require that developers use an in-app purchase system for legitimate app functionality—that is, application features that could have been offered as a single up-front purchase, but are made available via in-app purchase instead. In-app purchases of this kind can be a means of facilitating free trials or tiered functionality, and do not raise the same competitive concerns, and requiring the use of an in-app payment system in this narrow case may prevent app stores from simply hosting "free" apps that require that users enter a credit card to begin using.

However, extending the requirement beyond that to other kinds of purchases, like those of ebooks, media subscriptions, in-game items, or cloud services crosses the line from ensuring the sustainability of the app store to taking a cut of someone else's business merely because it is possible. (And from a customer perspective, it makes no sense that ebooks and physical books should be treated differently.)

In-app purchases policies also can result in "reader" apps that offer no in-app purchase functionality at all, which benefits no one. How does Apple benefit from Amazon being unable to sell Kindle books directly in the Kindle app? More recently, Apple has started to *require* that some apps offer in-app functionality when the app developer has made the business decision not to—not even permitting them to function as "reader" apps. This is analogous to a broadband provider deciding to block access to an app store unless it gets a cut of the store's total revenue. In short, it is rent-seeking behavior, not a means of ensuring the viability of the app store or protecting consumers.

With dominant platforms, there can be broad anticompetitive and anti-consumer effects from policies like this. Platform maintainers should therefore limit their in-app purchase rules to application features and functions that could otherwise have been offered via an up-front purchase, not to digital media, in-game items,

subscriptions, or cloud services more broadly, and should never *require* that in-app purchases be used.[135]

Developers should be able to truthfully communicate with their customers

App developers should be able, in their app, to provide truthful and accurate information to their users. The main reason that developers currently find themselves prevented from communicating with their users—telling them how to make purchases outside the app—may perhaps be obviated if the other recommendations in this paper are followed. Nevertheless, there are times when a developer may want to inform customers about features available on other platforms, for example, or deals available if cloud subscriptions or other products and services are purchased elsewhere. As a general matter, developers should be free to inform their customers of these options.

It is a good thing, of course, when platform maintainers seek to protect their users' privacy. For example, by preventing apps from requiring that users turn over unnecessary personal information before using an app, or by requiring that apps offer privacy-protecting login options where feasible.[136] At the same time, developers should not be restricted from establishing a direct customer relationship with their users through the app. And, when developers do so, platform maintainers should not be in a position to tell developers exactly what they can say through those relationships.

Allow users to set and change defaults

Consumers expect devices to come with a certain number of pre-installed apps. A device without a web browser is broken. A device without a camera app, or an email client, similarly so. However, there is no reason for users to be locked into system default apps. Just as on desktop operating systems, users should be able to change their default browser, email client, camera app, and so on. Changing defaults does not just entail changing the apps that respond to certain URL schemes, such as mailto:// for email and http:// for the web. It also includes all the ways that an operating system may default to certain apps—notes and music in a voice assistant, and other touchpoints for an app throughout the system, such as embedded music players, web views, mail sheets, and so on. Changing defaults does not eliminate the advantage of being a default or the privilege that a platform's first-party apps get, but it does offer some breathing room for developers while enabling a greater degree of user customization.

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[135] This applies to cloud subscriptions such as Office 365 or Dropbox storage, to digital media subscriptions like Netflix and Spotify, and to digital purchases such as music from Bandcamp, or in-game items. It should also apply to apps that use a subscription model merely as a form of optional patronage, or to access app features, or to remove ads, on an ongoing basis, as recurring payments of this kind could not have been initially offered as a single, up-front purchase.

[136] E.g., Sign in with Apple, https://support.apple.com/en-us/HT210318.

Limit preinstalled apps to essentials

While devices need to have some set of preinstalled apps, this does not mean that a dominant platform maintainer should be free to integrate just any of its apps and services into a device. As discussed above, default and preinstalled apps have a significant advantage over competing alternatives, even if an interested user can find and install third-party alternatives from the app store. There is no reasonable way to avoid this when it comes to apps that offer basic system functionality, such as taking photos or sending text messages. Additionally, as discussed above, platforms should not be prevented from improving their core product or expanding its functionality in reasonable ways, which is why this paper does not call for a complete ban on "sherlocking."

That said, it should not be fair game for a dominant platform maintainer to bundle any and every app it chooses or to merely assert that a first-party app is part of the "system." At a minimum, services that require an additional subscription, such as cloud storage or music or video streaming services, should not be given any specific preference over alternatives, including being preinstalled on a device.

It may be a judgment call as to exactly which apps a consumer expects to be a basic function of a device, and which should not. It may even change over time. But merely allowing consumers the ability to change defaults and install alternatives should not give a platform vendor free reign to engage in other forms of self-preferencing.

App store search transparency

Preinstalling apps on devices is not the only way that platform maintainers can give their own apps an advantage. The search feature of app stores—searching for app names, or for categories of app—is one of the primary ways that users discover apps. While the curatorial functions of an app store are inherently subjective, users have a reasonable expectation that search results are based on objective criteria. But without knowing what those criteria are, it is difficult to know whether poor app store results are the result of poor design, unscrupulous developers finding ways to game the system, or deliberate preferencing of apps from particular developers, including the platform itself. App stores should therefore make the ranking criteria for the app store search engine public, as well as provide a means for developers to register problems with search results (such as searches for the

exact name of an app not yielding results[137]) or when search results of particular terms are overwhelmed by apps manipulating keywords.[138]

Platforms should avoid using competitors' proprietary data to compete with them

As discussed above, platforms often introduce apps or features that compete with, or replace, offerings from third parties. In some cases, this can be anticompetitive. As a general rule, however, platforms should refrain from using the data that they have privileged access to for competitive purposes. App stores necessarily know how many times an app is downloaded and by whom. Operating systems often report usage metrics, which can be important for security and performance reasons. (For example, if an operating system bug is causing certain apps to crash more frequently, it is good if the platform maintainer is made aware of this so that it can fix the problem.)

However, to the extent that platform maintainers have access to proprietary, non-public information about third-party apps, they should generally avoid using this data in making their own choices about what products to develop, or what features to implement. Restrictions on the use of data of this kind (along with restrictions on bundling) can help limit unfair competition without altogether preventing platforms from competing in general. It can also allow platforms to continue improving core features without making it too risky for outside developers to deliver their own system improvements.[139]

Proactively offer secure APIs to for third-party developers for major new features

Platform owners have found that it is possible to give third-party developers greater power and access to more device features and user data in secure ways when it is in their interest to do so. To give an example: Android has allowed third-party replacements for the system software keyboard since version 1.5, in 2009.[140] This permits device manufacturers or users to have a different software keyboard appear whenever text entry is needed. Different keyboards can offer custom layouts and

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[137] Complaints of this kind are numerous among developers. *See* discussion at the Apple Developer forums, "App Store search of exact app and company name returns no results," https://forums.developer.apple.com/thread/94204.
[138] *See* David Bernard, https://twitter.com/drbarnard/status/1171382087670280192 (September 10, 2019), for one example of this.
[139] Public Knowledge has broader recommendations on these points in Harold Feld, THE CASE FOR THE DIGITAL PLATFORM ACT, (May 2019), https://www.publicknowledge.org/assets/uploads/documents/Case_for_the_Digital_Platform_Act_Harold_Feld_2019.pdf.
[140] Wikipedia, Android Version History, https://en.wikipedia.org/wiki/Android_version_history.

autocorrect systems, and ultimately were the first to introduce features like swipe typing. By contrast, Apple did not introduce third-party keyboard support until iOS version 8.

There are several issues to consider regarding this feature, which shed light on ways that platforms can offer developers enhanced functionality in other contexts. The details will always be different, though common themes emerge.

First, keyboards are not regular apps. A user does not switch from Twitter to Google Maps to a keyboard. Instead, keyboards are a system-level feature and, once installed, are invoked in any number of apps. Platform maintainers need to develop the functionality to allow apps that work this way to be installed and managed. Keyboards also raise security and privacy concerns—and here, Apple has introduced privacy features that Android has not. For instance, any time that iOS recognizes that a user is entering a password, it defaults to the system keyboard. This removes the possibility entirely of a third-party keyboard recording a user's password and perhaps sending it over the internet for some unscrupulous use. Additionally, third-party keyboards by default do not have what Apple calls "full access," which means they cannot connect to the network at all. Users can override this default, and may want to in the case of keyboards that rely on machine learning in the cloud to provide users with smart autocorrect or suggestions, or simply to update their dictionaries with new words without the need for a full app update. But in the case of a keyboard that offers only, for example, a better interface for selecting emoji, there may be no reason at all for a user to allow the app to communicate with some remote servers. In short, although it took Apple much longer to offer a feature than Google, when it did offer it, it baked in protections that either Google did not think were necessary or did not think of at all.

Similar considerations could allow a platform to continue offering third-party developers the ability to reach consumers with their products, and even compete with the platform maintainer itself, while still protecting user security. For instance, as discussed earlier, Apple continually gathers location information to improve its services by default. This policy makes its decision to make it more difficult for users to grant similar permissions to third-party apps potentially anticompetitive in effect, if not intent. Apple claims that the data it collects "to improve navigation, such as routes and search terms, is not associated with your identity. Instead, that information is based on random identifiers that are constantly changing,"[141] and has even claimed that "your route from A to B is fragmented into scrambled sections on Apple servers because nobody else should know your entire route. Not even us. In fact, we don't even know who requests a

[141] Apple, Privacy, https://www.apple.com/uk/privacy.

route."[142] If this is true, then Apple should share this private data that only it can easily collect with other apps on a user's phone. This data might not entirely replace the kinds of location tracking that developers might want to engage in, but, by offering, at a minimum, the data that it collects would offset competitive harm without threatening user privacy.

Similarly, Apple should allow third-party headphone manufacturers to access the same ability to sync their pairing status across devices,[143] so that users can use the same headphones with multiple devices without tedious pairing/unpairing/repairing steps, and allow third-parties to access the iPhone's new ultra-wideband chip and features to ensure that things like Apple's rumored item-tracking tiles do not have an insuperable advantage over market leaders like Tile.[144]

This approach—engineering APIs and solutions to ensure that third parties can offer functionality either not permitted by or that simply does not fit in the standard model of an app used, and then quit, requires work from the platform maintainer. However, dominant platforms have special obligations to ensure they do not unreasonably interfere with competition.

Obligation to allow archiving / emulation of older system versions

Fundamentally, problems of software preservation and research should be solved through changes to copyright law that recognizes copying, modifying, and distributing copies of software, as well as circumventing copy and access control techniques, as lawful when done for lawful purposes, such as research, preservation, and in some cases public access. However, changes such as these are out of the scope of this paper. Platform maintainers can help the effort, though, by providing technical data and source code for operating system versions, apps, and even device information[145] for products that are no longer commercially viable, but remain of interest to professionals, archivists, and even enthusiasts. With older projects, the same security and privacy measures that can, as an unintended

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[142] Christian Zebrig, *How Apple Maps Protects Your Privacy When Navigating*, iDownloadBlog (March 13, 2019), https://www.idownloadblog.com/2019/03/13/apple-maps-navigation-privacy.
[143] As Nilay Patel of The Verge has noted, "There is literally no way for another headphone company to compete with the advantages Apple gives itself." Nilay Patel, https://twitter.com/reckless/status/1188970777917448192 (October 28, 2019).
[144] Chance Miller, *Everything We Know So Far About Apple's Tile-Like 'AirTag' Item Trackers*, 9to5Mac (February 22, 2020), https://9to5mac.com/2020/02/22/apple-airtags-features-release.
[145] In the long term, the only way to continue to access older software is through software emulation or through specialized devices like field-programmable gate array (FGPA), e.g. the MIST 1.4 MIDI FGPA computer, AMIGAstore.eu, https://amigastore.eu/en/358-mist-midi-fpga-computer-with-midi-add-on.html, not continuing to maintain older devices. This requires that developers be able to accurately and completely implement device features in software, an effort greatly assisted by first-party technical information.

consequence, restrict worthy efforts like these have simply outlived their usefulness and should be possible to disable.

Allow users to transfer and merge accounts

The restrictions on software resale and transfer that app stores have brought about are a consumer rights problem that may require some fundamental changes to copyright law, as most media is no longer distributed via unique physical copies to which traditional notions of ownership (which is distinct from the ownership of intellectual property itself) apply to.

However, app stores can make it easier for consumers to exercise rights similar to those they traditionally enjoyed with physical property by 1) expressly allowing users to transfer the ownership of user accounts (with all their associated purchases, data, and subscriptions), and 2) allowing users to merge accounts, so that the digital assets of one account can be easily added to another.

The first issue may be less of a practical problem today than it may seem, because while the terms of service of typically forbid account transfer, all it takes in practical terms is handing over a username and password. While doing this may be helpful at times—for example, a person can leave their user name and password in a will to allow their children to access and download their photos and documents after they pass away—there is generally no clean way to add purchased content from one account to another. Since it is typically not possible, or at best extremely cumbersome, to use more than one account with a device at a time, this makes it all but impossible for a person to transfer, bequeath, or sell digital purchases. A parent can leave a library of books, records, and even software (that is on physical media) to their children-—there is no reason why these basic rights of alienability and ownership should cease to exist in practical terms merely because of technological changes.

Thus, while full "digital first sale" consumer rights may be a matter for legislation, dominant app stores can at least more easily facilitate digital transfers through formally allowing account transfers and create account merger capabilities. This does not mean that they have to allow piecemeal digital first sale of individual apps or media purchases or even acknowledge that consumers do in fact "own" what they have purchased. It simply means that, whatever rights consumers do have with respect to a particular user account, should be transferrable in a practical, authorized way.[146] This will help users regain some of the traditional ownership rights they enjoyed, by default, with physical media.

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[146] Jason Mazzone has argued for a similar policy. COPYFRAUD AND OTHER ABUSES OF INTELLECTUAL PROPERTY LAW 135 (2011).

Due process for developers

Public Knowledge has elsewhere argued that dominant platforms, in general, should offer their users due process.[147] This well-developed legal principle can ensure that rules are being applied fairly, and that mistakes—which are inevitable—can be corrected. In the case of a dominant app store, the right to due process would rest with developers who need to access the store to reach customers or an audience. Due process can ensure that small developers are treated as fairly as large ones, that outcomes are predictable, that precedent is followed, and that different people handling disputes within an organization do not come to arbitrarily different conclusions.

Among other things, due process includes notice of a proposed action and grounds asserted for it, the right to be heard by an unbiased decision-maker, an opportunity to present reasons for the proposed action not to be taken, the right to present evidence, the right to know the opposing evidence, the right to a decision based only on the evidence presented, and the right to written findings of fact including the basis for a decision. While platform maintainers typically have minimal appeal processes (and Apple has recently introduced a mechanism for developers to challenge rules themselves, and not just their application), they generally fall short of the full array of procedural safeguards that full due process rights provide.[148]

Due process can appear different in different situations, and platforms must build in safeguards against abuse, and ways to dispense with trivial disputes. Establishing procedures of this kind can help developers dealing with platforms feel less like they're talking to a black box and can help create both the reality and sense of fairer outcomes.

Greater business model flexibility

The structure of app stores (and retailers in general) always places constraints on how sellers can do business.[149] In many ways, app stores offer more flexibility than traditional retailers do. For example, Apple currently allows app bundles, and both Apple and Google permit sharing of purchases within families, as well as offering in-app purchases and upgrades, as well as subscription plans.

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[147] John Bergmayer, EVEN UNDER KIND MASTERS (2018), https://www.publicknowledge.org/assets/uploads/blog/Even_Under_Kind_Masters.pdf.

[148] Apple, Press Release, Apple Reveals New Developer Technologies To Foster The Next Generation of Apps (June 22, 2020), https://www.apple.com/newsroom/2020/06/apple-reveals-new-developer-technologies-to-foster-the-next-generation-of-apps ("[D]evelopers will not only be able to appeal decisions about whether an app violates a given guideline of the App Store Review Guidelines, but will also have a mechanism to challenge the guideline itself.").

[149] One example is how Apple's app store requires that apps be listed at certain prices—$29.99, for example, not $30. Jessica E. Lessin, *Inside Our App Store Ordeal*, (December 9, 2019), https://www.linkedin.com/pulse/inside-our-apple-app-store-ordeal-jessica-e-lessin.

A simple pricing model for app stores may have made sense early on. However, these examples show that app stores have already moved beyond the approach of just having apps be free, or available with a single up-front purchase. Innovation is fine—subscriptions and in-app purchases have enabled business models and categories of apps that did not exist before and have made some apps more accessible to users. (For example, an Office 365 or Adobe Creative Cloud subscription, that can be cancelled at any time, can be more accessible to ordinary users than an upfront purchase of hundreds of dollars.) But some tried-and-true software pricing models are tried-and-true for a reason. Upgrade pricing benefits developers by giving them a recurring source of revenue (and keeping customers loyal, if upgrade pricing is cheaper than switching to a competing app), and users, by giving them a discount compared with buying a license up front, and by presenting them with the *option*, not the requirement, of paying to upgrade. (Many users happily continue using old versions of software for as long as they work or skip a few cycles of upgrades. This is not possible with subscriptions, or with software that automatically upgrades without user choice.). Free trials allow users to see if they really want software before paying for it, without necessitating convoluted in-app purchases schemes. This gives developers the opportunity to prove to customers why apps with a higher price might nevertheless be worthwhile. Mature app stores should add them as options.

Conclusion

App stores do not signal the end of the open, competitive world of computing that has brought users so much, and created so many benefits for developers, since personal computing first took off in the late 1970s and eventually supercharged by the advent of smartphones. Instead, app stores and related platform technologies help address many of the problems that have accompanied the rise of these fantastically capable devices, guarding consumers against viruses and malware, and protecting their security and privacy. But, the immense power these technologies give platform maintainers can be used to enhance and fortify the platform maintainers' market power and its bottom line, in addition to protecting users. This paper's recommendations are designed to ensure that app stores continue to serve their pro-user purpose, and can continue to be sustainable businesses for platform maintainers, by creating more flexibility and safeguards for users and independent developers without giving up important security protections.

April 21, 2021

The Honorable Amy Klobuchar
Chairman
Senate Committee on the Judiciary
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Washington, DC 20515

The Honorable Mike Lee
Ranking Member
Senate Committee on the Judiciary
Subcommittee on Competition Policy,
Antitrust, and Consumer Rights
Washington, DC 20515

RE: *April 21st Hearing of the Subcommittee on Competition Policy, Antitrust, and Consumer Rights: 'Antitrust Applied: Examining Competition in App Stores'*

Dear Chairman Klobuchar and Ranking Member Lee:

On behalf of the Computer & Communications Industry Association (CCIA),[1] I write to offer some information for consideration in advance of the April 21 , 2021 hearing on "Antitrust Applied: Examining Competition in App Stores."

Competition plays a critical role in the economy as a driver of innovation from which consumers benefit. This is particularly pronounced in the tech sector, an industry characterized by its dynamic competition, driven by rapid innovation. As part of the competitive process, companies that offer better products and services often benefit from increased returns. This cycle incentivizes companies to continue to invest in innovation and compete to the benefit of consumers, as evidenced through lower prices and improved quality of goods and services.

To this end, we encourage consideration of the following facts when examining competition in the Apps store industry.

Consumers & Developers Connect Freely and EfficientlyThrough The App Stores in Open Ecosystems

App stores that operate on open systems provide an ecosystem for app developers to reach consumers in a free and efficient manner. In turn, consumers have a broader choice of software to

[1] CCIA is an international, not-for-profit trade association representing a broad cross section of communications and technology firms. For nearly fifty years, CCIA has promoted open markets, open systems, and open networks. CCIA members employ more than 1.6 million workers, invest more than $100 billion in research and development, and contribute trillions of dollars in productivity to the global economy. For more, visit www.ccianet.org.

use in their daily lives. In open systems, app developers and consumers have a number of platforms available to choose from including SlideME, 1Mobile Market, Mobile9, Opera Mobile Store, Mobango, F-droid, GetJar, and more. Consequently, both App developers and consumers can choose from a wide range of App Stores. Consumers and App developers can also move from one App store to another freely without being locked into any of these services as competition in open ecosystems requires. Closed ecosystems are different. While App developers and consumers might choose to use a closed ecosystem for other reasons, they will not enjoy the benefits of being able to switch to a competing App Store in that ecosystem.

App Stores Invest in Maintaining their Services to the Benefit of App Developers and Consumers Alike

App stores invest significant resources in research and development to maintain these ecosystems. This includes investments in privacy and security systems that protect consumers. The fee that some developers pay for hosting their products on an app store allows companies to continue investing in the ongoing development of protections that safeguard consumers.

Regulations on how app stores may charge developers could deter investments or innovation in software distribution. This is especially the case in open ecosystems where quality is at the center of competition between app stores. By constraining the means by which app stores recover the costs of maintaining a safe and trustworthy ecosystem, companies' efforts to innovate and provide consumers with newer and better app stores could be impaired.

Free market forces, including competition between app stores in open systems, prevent stakeholders from charging excessive fees. Therefore, any attempt to regulate App stores business models that operate in an open ecosystem will be detrimental to consumers and developers as it would eventually limit their options and likely decrease quality of services.

Thank you very much for your thoughtful consideration of these important issues. We look forward to continuing to work with you as Congress considers competition in the app store sector.

Sincerely,

Arthur D. Sidney
Vice President of Public Policy
Computer & Communications Industry Association

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Working Papers on
Pragmatic, Progressive Capitalism
WP # 4

BIG DATA PLATFORMS,
A NEW CHOKEPOINT IN THE DIGITAL COMMUNICATIONS SECTOR
Meeting New Challenges with Successful Progressive Principles

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1. THE ECONOMIC VALUE TO BE PRESEVED

THE URGENT AND COMPLEX NEED FOR POLICY

Many governmental bodies, research institutions, and expert practitioners have concluded that digital technologies have proven their value, but there are also significant harms and abuses of that technology that diminish the current value and threaten it future. In fact, a House Antitrust Subcommittee hearing on July 29th appears to have been "a rout in favor of the anti-monopoly movement" and reflects ongoing efforts to "get Republicans on board with sweeping updates to U.S. antitrust laws." However, the *Washington Post* editorialized that

> getting involved… to consider whether antitrust doctrine needs an update in the digital age, when big data shows skews what regulators thought they knew about pricing, and when unforeseen and often immeasurable harms may arise from the concentration of too much control in too few hands… Is a worthy task."[1]

While the *Washington Post* applauded Congressional hearings, it cautioned that "

> the line-drawing between good business and bad behavior may not be as easy as legislators make it seem… They must take care that… remedies address clear and concrete injuries – and that they don't cause new ones.[2]

The complexity of the situation is quite clear in the finger pointing about how we got into this mess:[3]

- The antitrust laws,
- lax enforcement,
- courts applying a discredited theory that gives all the benefit of the doubt to efficiency claim?

The uncertainty over causes interacts with the uncertainty over remedies:

- a radical antitrust approach that breaks-up all the dominant digital firms with little regard for efficiencies of integration or
- a more nuanced approach that recognizes and seeks to regulate platforms to prevent abuse while capturing some of their large efficiencies?

The goal of this working paper is not to regurgitate those analyses. Rather, it is to locate them in the framework developed throughout the Working Paper series and demonstrate that past approaches embedded in pragmatic, progressive capitalism should provide the launchpad for future policy. The lessons of history are extremely important at this moment.

- The institutional structure needs both antitrust and regulation to ensure a stable basis for the new digital political economy.
- The pragmatic progressive approach ensures both political stability and economic expansion.
- While the principles on which they rest are the same, the practice must be adapted to the new techno-economic relationships in the economy.

- Antitrust and regulation need to be rebooted, after a long period in activity,
- Antitrust and regulation also need to be recalibrated to fit the new economy.
- Antitrust practice needs to be redefined to be better equipped for the challenges of the new economy,
- Regulation practice, which was designed and is well-suited for communications networks (Big Broadband Networks), needs to be redefined for the challenges of digital information (Big Data Platforms).
- A new regulatory agency is necessary because, the existing sector specific expert agencies do not have portfolios and approaches (authority and power) to meet the task of overseeing the digital information sector.
- A new agency designed for the digital sector is important not only to provide oversight, but also to ensure flexibility and adaptability and promote competition.

Guardrails and guidance of pragmatic, pragmatic capitalism are designed to negotiate the classic dilemma:

- Insufficient regulation will allow abuses to continue and grow, ultimately undermining innovation and growth.
- Excessive regulation will compromise innovation and growth.

The studies on which we rely in this working paper, are like pragmatic, progressive capitalism, very much in the middle between these two extremes.[4] They reject both

- overly prescriptive regulatory mandates set in the stone of legislation (e.g. "utility-style regulation), and
- ineffective reliance on unregulated markets (irrational exuberance for deregulation or "horse and buggy" competition..

About 6 months before the House Judiciary Committee hearing, mentioned above, at which the CEOs of the largest digital platforms testified, a dozen antitrust practitioners and scholars filed a lengthy, heavily footnote laden letter as part of the record of the ongoing fact-finding hearings. Although they were narrowly focused on antitrust, that letter is a useful starting point to identify and address the challenges facing public policy at the quarter-life crisis of the 3rd industrial revolution.

Antitrust

They show clearly that antitrust faces a "double whammy" in responding to the challenges of the digital economy.

The first "whammy" reflects the fact that antitrust labored under a long period of increasing inactivity.[5] Lax antitrust enforcement was driven by a theory that gave short shrift to real competition and consumer harm resulting from the absence of such competition by giving all the benefit of the doubt to large, and especially vertically integrated entities.[6] It claimed that the harms of market power were small because powerful market forces prevented its abuse and there

were substantial efficiencies to offset any harms.[7] The theory had been thoroughly discredited, but it was deeply entrenched in the courts, which are always a lagging institution when it came to economic transformation.

The "blame" laid at the door of the courts reflects the details of the long-standing criticism of free market fundamentalism, which can be summarized as follows:

- markets self-correct,
- large, monopoly units promote innovation,
- vertical integration creates efficiency,
- harms of market power are small (the single monopoly rent theory) and
- fleeting (undermined by ease of entry and the contestability of markets, which disciplines behavior without actual entry).
- potential competition has been overestimated (the mere possibility of entry, contestability, is enough so discipline the abuse of market power) and undervalued (actual potential competitors who are harmed by exclusionary tactics or face real and artificial barriers to entry are given little weight).
- evidence of anticompetitive intent is ignored.

These failures of free market fundamentalism are a clear theme of the first working paper in the series on The Brandeis/Stiglitz framework for progressive capitalism.[8] The practical impact of this pragmatic approach can be seen in Brandeis' vigorous support for the Sherman Act and his belief that it needed to be updated and strengthened legislatively.[9] He was also concerned about democracy and participation, which have been the subject of considerable controversy in the antitrust community and tested the limits of antitrust practice.

The second, "whammy" stems from the fact that antitrust was confronted with a new set of economic characteristics of the digital economy. These would have been a severe challenge for traditional antitrust, even if it had been functioning at its full potential.

> Platforms are often insulated from platform competition to a substantial extent by substantial scale economies in supply and demand (network effects) combined with customer switching costs.14 The financial markets appear to value many large platforms at levels reflecting an expectation that they will earn substantial rents from the exercise of market power for an extended period of time….
>
> Large online platforms often exist in winner-take-all and winner-take-most markets. In those markets, there are likely to be long periods where a firm has a monopoly or dominant position, which makes anticompetitive conduct more dangerous. Exclusionary conduct and mergers involving online platforms, particularly dominant ones, can harm competition among platforms and harm competition among users on platforms.
>
> Antitrust law and enforcement have failed to respond to growing market power in substantial part because many key antitrust precedents—particularly those precedents governing exclusionary conduct—rely on unsound economic theories or unsupported empirical claims about the competitive effects of certain practices.[10]

This was a second major theme of the Brandeis-Stiglitz discussion in his support of significant regulation.[11] The aspects of daily life that were undergoing transformation during the 2nd industrial revolution demanded oversight by agencies that delved into the details of the operation of the new economic units. He devoted a great deal of attention to labor relations, financial institutions, social protection, and health and safety, to name a few of the most important major categories identified in the 100 elements of the Brandeis Protocol. He supported the creation of new regulatory bodies in response to the challenges of the 2nd industrial revolution, which Stiglitz celebrated in his model for progressive capitalism.

This is not to suggest that traditional antitrust is unaware of the challenges. The digital platforms have attributes that are magnifications of those that have been challenging for the antitrust law and practice. The solution for Brandeis and the 2nd industrial revolution was pragmatism, flexibility and above all, dual jurisdiction. Both antitrust and regulation were necessary to provide the guardrail and guidance that capitalism needed. Brandeis/Stiglitz also believed that broader policies were necessary, as well, including taxation, (voting) rights, personal freedom (privacy and speech). The importance and limitation of antitrust they identified are particularly trenchant at the critical junctures in industrial revolutions.

The defense of antitrust offered by the experts in their letter to the House Judiciary Committee launches from the observation that the growth of market concentration and the accumulation of market power that flows from it, constitute a failure of competition. This undermines the benefits associated with competitive markets including entrepreneurialism, productivity growth, innovation and fair treatment of labor. Market power leads to bad behavior. Consumers suffer from higher prices, lower quality and fewer choices. The supply-side is distorted by mergers and exclusionary tactics.

Regulation

The challenge that regulatory institutions face is even greater, in a sense a "triple" whammy, although the first two that afflict regulation are similar to antitrust.

Regulation has suffered under a long period of lax enforcement driven by the same, discredited theory that abuse is short-lived and policy action is not necessary.

They suffer from the second "whammy" because they were defined by specific technologies and functions – e.g. telecommunications, commerce. Their jurisdiction to deal with dominant Big Data Platforms is questionable and inadequate at best. Any action they take is likely to be challenged by dominant platforms.

Regulatory authority does not exist to deal with the challenge. While it might be possible to shoehorn new authority into an existing agency through legislation (expansion without legislation if doomed), it would be preferable to create a new agency. The experience under the Telecommunication Act of 1996, describe in the second Working Paper, argues very strongly for the creation of a new agency by legislation.[12]

CAPTURING THE BENEFITS OF TECHNOLOGICAL CHANGE, WHILE PREVENTING THE ABUSE OF MARKET POWER

In this Working Paper we examine how the issues and concerns that pragmatic, progressive capitalism successfully handled in the response to the quarterlifer crisis of the second industrial revolution play out in the contemporary debate around the response to a similar challenge confronting the third industrial revolution. The introduction to a major paper from the Stigler Center that involved over 30 leading analysts and practioners in antitrust, privacy, journalism, and democratic practice framed the issue confronting oversight over big digital platforms in exactly the way the Brandeis-Stiglitz framework does, as described in an earlier working paper.

One the one hand, there are immense benefits flowing from a technological revolution – efficiencies and potential growth that parallel the starting point of the Brandeis-Stiglitz framework.

> One of the key defining factors of the past decade is the rise of Digital Platforms (DPs), such as Google, Facebook, Amazon, Apple. As more and more of our economy and society moved online, these companies ascended from non-existent or nearly bankrupt in the early 2000s to join Microsoft as global behemoths, exceeding (as of August 2019) more than 4 trillion dollars in market capitalization.
>
> This meteoric rise is not surprising. These companies invented new products and services that revolutionized the way we work, study, travel, communicate, shop, and even date. In the process, they created trillions of dollars in consumer surplus.[13]

On the other hand, new technology and the benefits it delivers does not excuse anticompetitive practices or the abuse of market power that causes harm to the public, which was the central concern of Brandeis and Stiglitz.

> Nonetheless, recognizing the enormous gains brought about by these companies to date does not equate to saying that: (i) these gains will endure, especially if markets are no longer competitive; and (ii) there is no room for welfare gains by reducing some of the downsides brought about by them.[14]

However, it is critically important to recognize that there are clear differences in the existence and abuse of market power across companies and markets that require nuanced responses to preserved the benefits.

> The term "Digital Platform" lacks a consistent definition—different companies may be characterized as a platform in different environments. For example, Google, Facebook, Amazon, Apple, and Microsoft raise different concerns regarding how their "bottleneck power" impacts the markets in which they operate. Considerations on market power involve all five companies mentioned above.[15]

The challenges are somewhat different because the nature of the technology is different, but the principles of and effective policy response to promote competition and ensure consumer protection are not, as shown in WP#1. Institutions that worked well to achieve the economic, social and political goals in pursuit of these goals need to be updated, but not abandoned. The Stigler paper advocated, responses that were "least intrusive."

> This *Policy Brief*, aimed at a non-specialized audience, summarizes the main concerns identified by these studies and provides a viable path forward to address the identified concerns.[5] It tries to do so in the least intrusive way possible.[16]

From the point of view of this analysis and the ongoing debate over how to shape the political economy, the phrase "least intrusive" is acceptable, as long as it is subject to key conditions. It is certainly consistent with the notion of preserving decentralized competition and markets. However, the policy response must not sacrifice effectiveness in service of the objective of "least." This applies to both horns of the dilemma. It needs to be intrusive enough to get the job done, but not so intrusive as to undermine the dynamic growth of the economy. Therein lies the rub, the need to balance guardrails and guidance that set the goals and orient the market, while letting the market operate to the greatest extent possible in pursuit of those goals, a process we call "command-but-not-control regulation" when applied to specific examples.[17] With these caveats, this part will rely heavily on the Stigler paper.

OUTLINE AND PURPOSE

The digital information system is the heart of the digital economy, but it has become a source of great concern to economists and policymakers. This paper analyzes the second great challenge facing the digital communications sector at a turning point in the digital (3rd industrial) revolution. It examines the benefits and threats that Big Data Platforms create for competition and consumers. These platforms have become a key chokepoint in the emerging information age. Continuing to enjoy the immense benefits that the flow information creates while preventing the abuse of information as it flows through these chokepoints is a critically important juncture for the digital economy.

Earlier working papers have laid the groundwork for this analysis by establishing the framework of pragmatic, progressive capitalism that successfully negotiated similar challenges at the same point in the 2nd industrial revolution (WP#1). We have described how those principles were applied to the communications infrastructure (network neutrality, WP#2 and Business Data Service, WP#3)) in the past and explained why those successful policies provide powerful lessons for the policies that should be adopted establish the guardrails and guidance for the information system.

The remainder of **Chapter 1** frames the current dilemma faced by policymakers. It explains the sever challenges faced by both antitrust and regulatory authorities, made particularly sever at this critical juncture because the traditional authorities they possess have not been effectively utilized and because new approaches are needed to deal with the new economic relationships.

Chapter 2 describes the key factors that underly the immense power and success of digital technologies. These benefits of the economic transformation represent the first horn of

the dilemma that confronts policymakers. Preserving these benefits are necessary if the dynamic of economic progress is to be maintained. The chapter also briefly identifies the second horn of the dilemma, the harms of anticompetitive structures and abusive conduct that may undermine the important positive processes. It argues that a "tight oligopoly on steroids" has come to dominate the key aspects of the digital information sector. The remainder of the paper is devoted to understanding and proposing effective responses to the harms that will preserve the benefits. Passing through the horns of the dilemma is difficult, but a similar challenge was successfully met early in the 2nd industrial revolution.

Chapter 3 describes the challenges that Big Data Platforms pose to traditional antitrust and regulation from several points of view. It starts with a structure-conduct-performance of the challenges the new technology poses, then outlines the many market failures that must be addressed by policy.

To overcome these challenges, the policy response must understand why the Free Market Fundamentalist view should be rejected. This is the subject of **Chapter 4.** This includes a discussion of why existing antitrust institutions are inadequate to regulate the day to day market power that the new technologies inherently create.

Chapter 5 lays out the principles for the response to the dilemma. It argues for reinvigorated (to overcome decades of misguided laxity in enforcement of existing authority) and recalibrated (new definitions and authorities to adapt to the new technology) antitrust. Regulation of daily activities must also be reinvigorated and recalibrated, but with the added problem that no single agency has a portfolio that is broad enough to deal with the reach and variety of activities in which the Big Data Platforms engage. We believe it is necessary to create a new digital data agency.

Chapter 6 provides advice on specific approaches policy makes should ("Dos") and should not {"Don;ts") implement with the goal of creating flexible oversight that negotiates be between the horns of the dilemma.

The section argues

- for dual (antitrust and regulation) should be applied, as has been the case for over century in telecommunications.
- against overreliance on antitrust, particularly Section 5 regulatory authority of the FTC, which was never very effective because of its structures and has been a disaster in the digital age.
- for flexible, expert agency oversight with clearer goals and strengthened tools articulated by legislation where necessary
- against utility-like regulation that will stifle innovation in a sector that is far more dynamic that traditional utilities and against simplistic, extreme antitrust approaches that break up everything to create a "horse and buggy" where units are too small to capture the powerful economic of scale, scope and integration that typify digital platforms.

The approach offered does not rule out bans or structural solutions, but it argues that these should be implemented by expert agencies where careful analysis shows that preventing abuse cannot be achieved by less intrusive interventions.

The chapter concludes by showing that other analyses support the approach taken in the working paper.

2. THE ADVANTAGES OF THE DIGITAL POLITICAL ECONOMY

Throughout the working papers we have emphasized two different kinds of benefits and harms.

One set is grounded in the "traditional" view of competition and the benefits that flow from decentralized, capitalist markets. The harm of market concentration and abuse of market power are "traditional," having long been recognized by antitrust and the need for regulation where circumstances dictate that market power is likely to be strong and long-lived (small numbers, inelastic demand, barriers to entry, etc.). Business Data Services[18] were the quintessential example, although even the most advanced firms that control the networks over which digital data flows rely on "traditional" anticompetitive practices to abuse, defend, and extend their market power. In fact, this paper shows that advanced technology are not a guarantee against the "traditional" abuse of market power; they may even facilitate and expand it.

The second view of competition is not "traditional," but flows from the unique characteristics of digital technology and the digital revolution. Here we have identified new processes that rely on public policy and experimental entrepreneurialism in competitive markets to yield much higher and faster levels of economic development and change. The essence of a technological revolution is to transform the productive process across a wide swath of society, which we have demonstrated in the discussion of the 2nd industrial revolution (WP#1 on progressive, inclusive societies and capitalist technological revolutions) and the 3rd industrial revolution (WP#2: on network neutrality), primarily by dramatically lowering costs (WP#3 in the cost of communications technologies.

However, we stress that the transformation is not a certainty or without dangers. Dominant incumbents, both Big Broadband Networks and newly dominant Big Data Platforms can gain market power and abuse it using "traditional" tools and new tools, while making arguments that digital technologies are so special they should not be subject to antitrust or regulatory oversight. We have shown through the historical analysis that those arguments were wrong at the critical juncture of the second industrial revolution, as they are wrong at the critical juncture of the 3rd. We have argued that the lessons of pragmatic progressive capitalism, that worked so well in the response to the second industrial revolution, can, and should, be applied to the critical juncture of the third industrial revolution.

This paper, which deals with the Big Data Platforms as the new chokepoint in the digital communication sector, delves into the details of these observation. WP#2 focused on the central dynamic process of the digital revolution in communication – innovation at the edges without permission. Here we begin with the broader, "non-traditional" benefits of digital technology in the communications sector and more broadly in the economy. By expanding the view of economic transformation, we are able to catalogue the threat posed by Big Data Platforms, as shown in Table 2.1

TABLE 2.1: UNIQUE ADVANTAGES OF OPEN DIGITAL PRODUCTION THAT ARE THREATENED BY THE RISE OF THE TIGHT OLIGOPOLY OF BIG DATA PLATFORMS

Benefits of the "open" End-to-End Internet				Harms of Abusive Big Data Platforms
Activity	Shared Resource	Process	Benefits	
Supply Side Economics of Scale and Scope = Transformation Resource Savings				
Internet	Network	Open Protocol/Open Access	Innovation at the edge	Closed access, restricted innovation
Mesh Network	Spectrum	Embedded Coordination Algorithms	Dynamic occupation of spectrum	Centralized management slows progress, creates barriers to entry
Open Source Software	Code	Embodied Knowledge in software	Exploiting rich information in real time	Proprietary information limits value
Peer-to-Peer	Storage, Bandwidth content	Torrenting, Viral communications	Reduction in cost and expansion of throughput, broad exchange	Segmented market/functionalities
Transaction Cost Reduction				
All	Info search & deliver	"order fulfillment"	Immense time/resource savings	Biased results favor subset
All	Local Knowledge	Consumer as producer	Fit Between consumer needs and output improved	Restricted access to knowledge
Demand-Side Economies of Scale and Scope, i.e. Network Effects = Value Creation				
All	Direct	New Products	New values created and old value fulfilled more efficiently	Managed products tied to bundles
All	Direct	Self-organizing	Increased option value, supply-Side support for open source property due to specialization	Option value restricted by proprietary interest
All	Indirect	Increased value of niches	Value from diversity of Apps & content expands due to ease of aggregating demand	Competition through niche-based entry curtailed

Source: End-to-end benefits adapted from Mark Cooper, 2006, From WiFi to Wikis and Open Source. Journal on Telecommunications and High Technology Law, 3:1, pp. 133, 138 and applied to the characteristics of the emerging system as described in Mark Cooper, 2017. The Political Economy of Electricity: Progressive Capitalism and the Struggle to Build a Sustainable Power Sector (Santa Barbara, Praeger), Chapters 8, 10, 11. Other, non-digital examples are provided in Mark Cooper, 2011. Structured Viral Communications: The Political Economy and Social Organization of Digital Disintermediation. Journal on Telecommunications and High Technology Law, 9:1

ECONOMIC ADVANTAGES OF DIGITAL

As described in Table 2.1, we identify numerous advantages created by digitization of the economy. Three distinct economic forces are at work: supply-side reductions in production cost (what North refers to as transformation costs), lowering transaction costs (a central concern of North), and increases in demand side value. A brief discussion of the benefits is necessary to lay the groundwork for the remainder of the paper, that focuses on the threats.

The advantage of the economic transformation process rests on tree factors.

First, each set of activities accomplishes greater coordination by applying a combination of technological and human coordination. For instance, mesh wireless communications rely more on embedding cooperation in the technology: the algorithms and protocols of communications devices. Open source, in contrast, relies more on human cooperation, greatly enhanced by digital communications. Peer-to-peer networks made up of non-technologists stand between the two. Technology does much of the work, but the functioning of the network requires the cooperation of the people using it. Most importantly, these networks survive with varying levels of human cooperation and skill.

In each case, networks share critical resources: spectrum, code, storage, and bandwidth. Sharing requires a process, a principle of cooperation that organizes the critical factors of production. The sharing of resources creates significant efficiencies for the networked activities and confers benefits to the collaborating parties. The capacity of the network expands. When the benefits are larger, the cost is lower. When it is easy to communicate, collaboration is more likely. A similar process has been shown to affect the electricity system.[19] The ease of communications is driven in significant part by the rapidly declining cost of equipment, as shown in the previous paper. Recent analyses of technological innovation have provided strong evidence that the digital communications platform transformed the very fabric of the innovation process.[20]

Second, the transformation dramatically lower transaction costs. The technologies at the core of this revolution reinforce the dynamic of this change because they are platforms within networks. They are important because there are strong complementarities between the layers and each layer sustains broad economic activity in the layer above it.[21] Communications and computer industries have always exhibited network effects and strong economies of scale.[22] Digitization reinforces these economic characteristics because economies of scope reinforce economies of scale. The technological revolution altered the information environment to make distributed solutions more feasible by fostering the uniquely user-focused character of the communications-intensive Internet solution.

> "A platform is a common arrangement of components and activities, usually unified by a set of technical standards and procedural norms around which users organize their activities. Platforms have a known interface with respect to particular technologies and are usually 'open' in some sense."[23]

The Internet thrived and has become the focal core communications resource system of the digital economy because it possessed characteristics that are ideally suited to a cooperative,

non-governmental solution to a social dilemma. The policies simultaneously opened the communications space to widespread market entry and innovation under a radical, new approach to electronic communications, while ensuring that the telecommunications network (the focal core communications resource system of the second industrial revolution) on which the Internet was dependent would be available on terms that held the incumbent network operators in check.

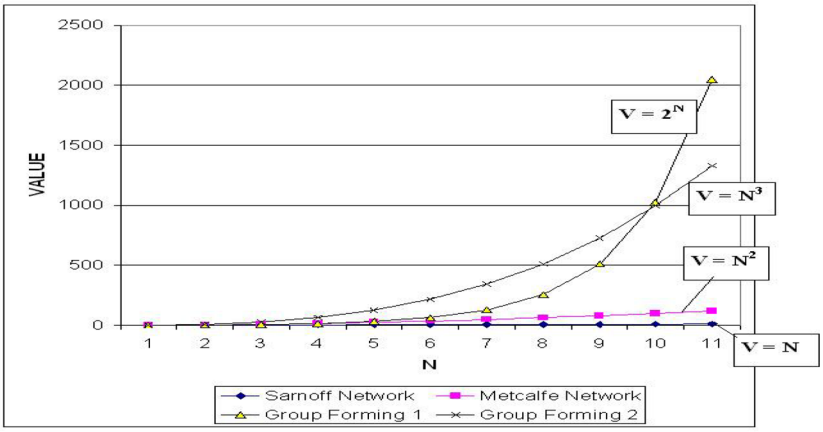
Earlier analysis referred to "collaborative production" because the effects were most apparent in the growth of that approach, but it was not limited to some unique "third-way." "co-invention" and a transformation of production that included a much more collaborative approach within and between firms has become a large part of the broad response to the technological revolution. Referring to "collaborative production" is an apt phrase for distinguishing and describing the economic transformation. Collaborative production also produces an economic advantage because it lowers transact costs. Here there are two important processes. First, it clearly streamlines the search, acquisition and delivery of products. Products that can be delivered digitally (music text, video) are most greatly affected, but the impact is felt for physical products, too.

Third, the technological advance is also making user-based design an attractive option. [24] It allows individuals to participate in task portioning and decision-making.[25] The technology transforms consumers into producers.[26] This introduces the important transformation on the demand-side. Here there are two impacts. One obvious benefit is the introduction of entirely new products. A more subtle, but equally important, impact is the improvement in matching supply and demand. Reducing or removing the distinction between user and producer results in substantial transaction cost savings. The distance shortens between what producers produce and what consumers consume because the consumer turned producer knows what he wants more than a producer who is not a consumer. The consumer's and producer's interests are identical as they are the same person.

Users know what they need and want. Transferring that knowledge to producers creates inefficiency. Producers who are also users and volunteer for tasks that interest them inherently understand the production problem more clearly and can produce for their needs more easily instead of for the masses. They have the locally specific knowledge necessary to solve problems.[27] There is also an agency problem when consumers are not producers.[28] When producers are separate from consumers, the producer may not be able to meet the needs of individual consumers precisely. However, when the developer is also the consumer, he will act in his own best interest when producing a product.[29]

Demand side economies of scale and, especially scope (network effects), are extremely important. Demand side economies of scale are known as network effects, so this should not be surprising. This includes both direct and indirect network effects. Direct network effects are well known as the ability to reach more people. Indirect network effects occur, where consumers benefit, not because of their ability to directly connect to others and the value they place on those connections, but where the existence of potential demand expands the options that they have. The ability to create and expand markets, particularly niche markets, because of the reduction in production and transaction costs benefits all consumers. These effects can be understood as the benefit of group forming networks created by the new technology.

FIGURE 2.1: THE VALUE OF TRADITIONAL AND GROUP FORMING NETWORKS



Source: David Reed, "The Sneaky Exponential – Beyond Metcalf's Law in the Power of Community Building, 1999.

The value of being part of the network scales as the number of members increases (as shown in Figure 2.1), with the Reed community 2^N, having the highest value by far. The key difference in the Group Forming Network is multi-way communications. Group Forming Networks use group tools and technologies such as chat rooms and buddy-lists that "allow small or large groups of network users to coalesce and to organize their communications around a common interest, issue, or goal."[30] The exponentiation increases value very quickly and may cause the number of connections/communications to exceed the ability of individuals to maintain them. Thus, it is a theoretical upper limit. On the other hand, as Reed points out, the formation of even a small subset of the theoretically possible groups would dramatically increase the value of the network - N^3. Even if not all groups form, the potential value in the option to form groups is higher. The critical point is that to capture the value of group forming networks, the members of the network must have the freedom to self-organize groups. With that freedom, they create the groups of greatest value to the users.

Table 2.1 identifies the numerous ways that dominant big data platforms undermine this process by using their market power to "lock consumers in," making it harder to move about and freezing out competitors. Raising barriers to entry and increasing switching costs are not only anticompetitive, they are the antithesis of the dynamic process of innovation at the edges without permission that is central to the dynamic innovation in the digital space.

COMMUNICATIONS TECHNOLOGY AND COLLECTIVE ACTION

The transformation of a third sector – political mobilization – is equally important. Group Forming Networks use group tools and technologies such as chat rooms and buddy-lists that "allow small or large groups of network users to coalesce and to organize their communications around a common interest, issue, or goal."[31]

Conventional collective action arguments say that a large group is less likely to generate collective goods because each member would receive such a small fraction of the benefit that they would lose their desire to produce collectively. [32] However, with the emerging collaborative production the opposite is true as seen in open-source software: the larger the group connected by the Internet, the more likely it is to have the motivation and resources to create code.[33] User-driven innovation causes individuals to volunteer, particularly the core group of lead users.[34]

The existence of heterogeneous resources available in the network definitely improves the efficiency of collaborative responses, but this may not be a necessary condition. The critical condition is the ease of communications. The Internet, for instance, spawned innovation, as participants of group projects were able to work together over long distances and share their specific skills in a "seamless process."[35]

New communication technologies allow for reduction in cost of sending information long distances, increase "noticeability, and make ineffective communicative networks effective."[36] Communications technology allows large numbers of people with common interests to interact and share information "in a way that undermines many widely held beliefs about the logic of collective action."[37]

It may well be that the literature on collective action was always too pessimistic.[38] For example, the literature that stresses the tragedy of the commons assumes "individuals do not know one another, cannot communicate effectively, and thus cannot develop agreements, norms, and sanctions" that was never correct in physical space and certainly is not correct in cyberspace.[39] The ability to communicate changes everything – especially when a collective payoff flows from cooperation.

In addition, the recognition of shared interest plays a key role in establishing the necessary cooperation. When a monitored and sanctioned system is agreed upon, it "enhances the likelihood that agreements will be sustained, they are capable of setting up and operating their own enforcement mechanism."[40] Due to the benefits received from cooperation, the effect of breaking those agreements may deter those inclined to break the agreements, as it will affect not only the individual, but also the group as a whole.[41] Thus, even prior to the advent of digital communications platforms, the ability to communicate and exchange information was central to the ability to organize around shared interests and take collective action, but the capacity to do so has been fundamentally enhanced by the recent technological revolution.

As with all new technologies, the dramatic increase in the ability to communicate is a double edged sword. Communications facilitated innovation and collusion, as shown in WP#3. All speech is facilitated, both good and bad (however they are defined). The ability to gather and process unprecedented quantities of data has pluses and minuses. The goal of policy is to promote the "pluses" and reduce the "minuses."

TRANSFORMING THE BROADER ECONOMY

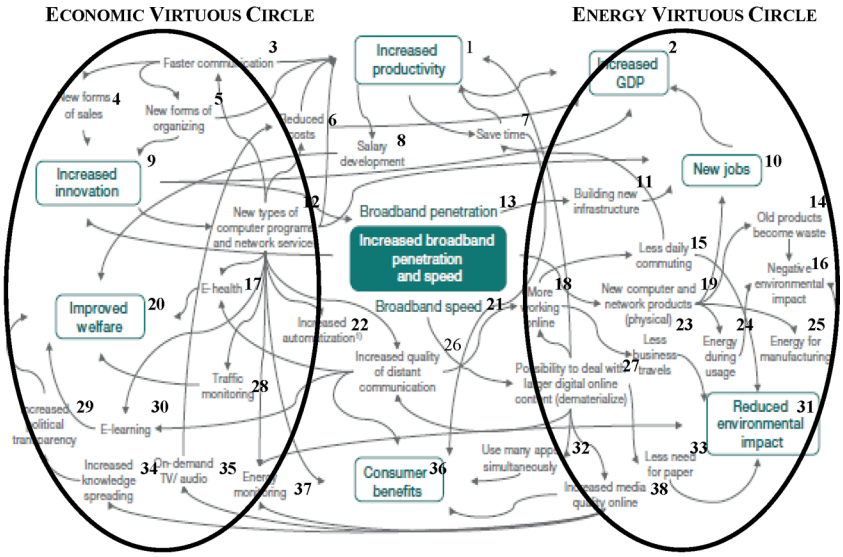
The economic advantages of digital technology translate into a powerful force for change in the entire economy. The dramatic shift of activity online reflects the value that consumers derive from the new services that digital technologies deliver, as discussed in WP#3).

Underlying this change in consumer behavior is a fundamental transformation of economic activity. In the early days of the digital revolution, some questions were raised about the benefit of the massive investment in the technology in the form of a "computer paradox."[42] Three decades later, there is no doubt that the economy has been transformed and growth has been stimulated by the digital revolution.

We have used Figure 2.2 to capture the complexity and totality of the transformation of the political economy. Across the top half of the graph we see the benefits that accrue to the broad economy as the penetration and speed of broadband Internet access and use advances. Across the bottom half of the graph we see the individual-level benefits. The major categories of performance (the 38 numbers in the graph) were identified in WP#1 as they affect the progressive capitalism model of Stiglitz. Although there are many effect, the Figure also identifies two powerful virtual circles (that were the focal point of WP#2) that result from the transformation, in the economy on the left and the energy sector on the right.

FIGURE 2.2: IDENTIFYING THE IMPACT OF THE DIGITAL REVOLUTION

MACROECONOMIC LEVEL BENEFITS



Sources: Upper: Ericsson, Arthur D. Little, and Chalmers University, *Socioeconomic Effects of Broadband Speed*, September 2013. A much simpler version that conveys the same message can be found in International Telecommunications Union, *Impact of Broadband on the Economy,* April 2012, p .3.

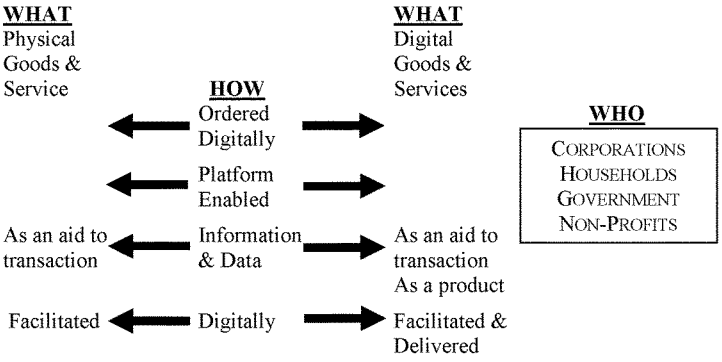
The effect of technology is magnified when the latter includes technology that supports communication, enhances productivity, and improves the wellbeing of the society. In this regard, development in technology is expected to lower the cost of production, streamline supply chain processes, provide access to information in decision making, and support consumers in acquiring quality products at competitive prices. In this regard, development in technology is expected to lower the cost of production, streamline supply chain processes, provide access to information in decision making, and support consumers in acquiring quality products at competitive prices.

We present this graph to underscore the fact that the policies must be carefully thought out and implemented. Because the benefits are so large, overly simplistic policies that essentially ban activities can impose large costs (losses) on society. However, as we have seen, technological change is not a guarantee against the accumulation and abuse of market power.

Another, simpler, view of this process is provided in upper part of Table 2.2 with a discussion from an OECD document that seeks to explain the challenge of measuring the transformation at a practical level. The analysis focuses on how existing approaches to measures gross domestic product and price changes have not been adjusted to deal with the change.[43] This is also a frequent topic of analysis in the U.S. economic literature.[44]

TABLE 2.2: ECONOMIC PROCESSES UNDERLYING THE DIGITAL REVOLUTION

Four Digital Dimensions of Both Digital and Physical Transactions



Source: xx

The original framework focuses on digital goods and services only, since that is the greatest challenge for changing indices. However, the impact of the digital revolution also affects physical goods and services, which presumably are already reasonably well incorporated into the measures of economic activity. We have added to the framework in three important ways. First, we have included the physical side. Second, because the framework is focused on the fully digital economy, it treats Information and data as a product (What). We believe information and data should also be treated as a how, a transaction cost reduction, particularly for physical goods and services. In theory this effect is captured in existing indices (i.e. final values and prices).

Third, while the original framework focused on the delivery of fully digital products, we believe it is crucial to also identify digital as a facilitating the delivers of physical goods and services.

Table 2.3 is from a study by Avi Goldfarb that expands on the framework from the OECD paper and takes the analysis to a much deeper level. He identifies three specific, common economic tasks that are improved by digital technologies, storage, computation and transmission. We divide the latter into three components, interconnection, flow and control, which are suggested by his analysis and will be important in the policy discussion. We identify specific technologies that support the transformation of these functions, distinguishing between hardware and software. These are at least implicit in his discussion and are important in the later policy discussion. Finally, we extract the positive impacts of each of these changes on the economy from his discussion.

TABLE 2.3: THE FUNCTIONS, TECHNOLOGIES AND IMPACTS OF THE DIGITAL REVOLUTION

Core Functions	Supporting Technologies	Impacts	
	Hardware	**Positive**	**Negative**
Storage	Massive medium	1. Cost Declines	
Computation	CPU	2. Search	
Transmission	Networks/ Broadband	3. Replication	
Interconnection	Code	4. Transportation	
Flow	Internet	5. Tracking	
Control	Policy-based-routing	6. Verification	
		7. Communications	Information
	APPS (software)	Decentralizes	Centralizes
	Browser	8. Coordination	Integration
	Search Engine	9. Open Access	Open Access
	Social Networks	10. Complements	Incentives to Produce
	Mobile Communications	11. Matching	Negative Externalities
	Security	12. Access to Inputs	Breach/Privacy Cost
	Customer Relations Mgmt	13. Discovery	Spam
	Data Collection & Use		Crime
			Hate
		14. Marketing	Marketing
		15. Matching demand	Shaping Market tools
		16. Variety	
		17. Quality diversity	
		18. Inventory Efficiency	

Sources: Avi Goldfarb, xx

We also introduce the negative impacts, which he includes in the discussion. Needless to say, these negative impacts are the launchpad for much of the policy discussion. Thus, Goldfarb's analysis reflects one of the central themes of this paper – the need to recognize both the benefits and harms of the technological revolution. This factor focuses on the benefits, just acknowledging the harms.

TIGHT OLIGOPOLIES ON STEROIDS AND GATEKEEPER THREATS

More detailed discussion of both benefits and harms for Big Data Platforms are discussed in this paper, as are the policies best suited to control the harms without undermining dynamic innovation in the sector. Two earlier working papers examined the challenge and threat Big

Broadband Networks (WP#2 and 3) pose to the future of the digital economy. Here we introduce two common, interrelated themes in the overall analysis that tie this working paper to the previous two – the growth of a "tight oligopoly on steroids" and the gatekeeper role that threatens to undermine dynamic innovation in the digital communications sector (see Table 2.3).

TABLE 2.3: THE TIGHT OLIGOPOLY ON STEROIDS: BIG BROADBAND NETWORKS AND BIG DATA PLATFORMS

Tight Oligopoly on Steroids Characteristic	**Big Broadband Networks**	**Big Data Platforms**		
High Concentration Multi-market contact	Franchise, economies of scale Telco BDS, Wireless Cable MVPD, BIAS	Economies of scale & scope, zero marginal cost, winner-take-most Google Search	Facebook, connectivity	Amazon, distribution
Technological Specialization	Point-to-point (landline) Cell Networks Star video	Google Algorithms & network value	Facebook Network Value	Amazon Distribution efficiency
Product Segmentation	Voice, wireless Video, BIAS	Search	Social Media	Distribution
Unique Product Traits	Geographic Separation Local network Franchise origin	All: Must Have Content protected by lock-in supply-side foreclosure and demand-side bundling and behavioral manipulation		

Source: The "tight oligopoly on steroids" was introduced in Mark Cooper, 2016,

The high degree of concentration among Big Broadband Networks in the communications sector and the high degree of concentration among Big Data Platforms in the information space are reinforce by four other factors that create a "tight oligopoly on steroid,"

High concentration is reinforced by multimarket contact, technological specialization, product segmentation, and geographic separation (for Big Broadband Networks) or must have bundles (for Big Data Platforms). Our working papers show that the tight oligopoly on steroids afflicts both the communications networks (Big Broadband Networks) and the information system (Big Data Platforms). The tight oligopoly on steroids results in the classic harms of lack of competition, denial of consumer choice, insufficient innovation, higher prices, and lower quality.

The members of the "tight oligopoly on steroids" have gatekeeper control of chokepoints, reinforced by steroids that give the small number of firms that dominate the digital communications sector immense market power. They have demonstrated time and again that they have the willingness and ability to abuse that market power. Specific areas where policy can move forward in spite of the complexity include:

- Concentration: Public policy must not only deal with the high level of concentration, it must also address the steroids, if competition is to be restored for Big Data Platforms).
- Horizontal or vertical concentration: Increases should be prevented, while past mistakes that allowed excessive concentration should be reviewed and remedies proposed.
- Anticompetitive bundling: Take action to avoid anticompetitive bundling, banning unfair rates terms and conditions, requiring open access to APIs.
- Tacit Collusion: While explicit collusion is clearly illegal, tacit collusion and parallel exclusion should be prevented, as well.
- Exclusionary practices: Numerous practices should be banned, including predation (with a new standard for anticompetitive pricing), foreclosure, denial of access to customers. Self-dealing
- Transparency: Fair Information Practices
- Privacy: Effective consumer choice. One of the great challenges is access to data and the solution cannot be just force the data to be shared, unless there is a much stronger regime of consumer sovereignty over data.

3. THE NEW CHALLENGES OF THE ABUSE OF DIGITAL TECHNOLOGY

THE STRUCTURE AND CHALLENGES OF THE DIGITAL REVOLUTION IN COMMUNICATIONS

The Stigler antitrust subgroup recognized the benefits (increase in surplus) of the digital revolution, but are not lulled into thinking there are no harms., highlighting why competition is not enough to guide the economy.. The core logic of the new dominant form of industrial organization must be respected, but the inclination of capitalists across all periods to exploit and abuse their market power in anti-competitive, anti-consumer, anti-social ways must be recognized and countered.

Table 3.1 identifies over a dozen characteristics of workably competitive markets offered in one of the most frequently used texts in the field of industrial organization, which relies on the structure-conduct-performance paradigm. The authors recognize that competition is never perfect, so "doubts concerning the competitive model's utility as a policy guide prompted a search for more operational measures of workable competition." They summarized a large literature on "the criteria of workability…divided into structural, conduct, and performance categories." Since structure and conduct criteria are often associated with performance outcomes, we allocate performance measures to structure or conduct criteria, where the overlap is very clear. The result is ten criteria. In the right-hand column, we summarize the characteristics of the big data digital platforms that suggest these markets are not likely to be workably competitive. The Stigler antitrust group's framing of these issues will be discussed below.

However, it is important to reiterate at the outset that that the fact that antitrust and regulation have failed to prevent the harms in recent years is not a justification to abandon the benefits. The historically successful response to this challenge has been to do the opposite – to control harms without undermining the benefits. The moment has historically required a shift toward progressive policies, not a step backwards. Regulation by a strong entrepreneurial state is backed up by antitrust that seeks to protect competition where it is the more efficient policy tool. The triumph of market guidance in progressive capitalism explains why Marx was wrong and Brandeis would be very unlikely to make the same mistake. [45]

The Stigler antitrust group offered a pragmatic approach highlighted throughout this paper. "Ideally, the goal is to steer technological advances to ensure widespread benefit without widespread harms—to protect and preserve innovation and advancement while minimizing the harms so that all of society reaps net benefits."[46] The underpinning of the analysis means their report "is offered in the spirit of ensuring a future of continued technological and economic progress and social well-being as we move forward in the digital age."[47]

Thus, they start from the recognition that "[e]very technological revolution comes with the potential to create unprecedented value," but also a need to address specific problems arising from the digital platforms' reach, scale, scope, and use of data.[48] Policy is necessary because "[b]enefits from innovative firms could be even greater and more equitably spread, ensuring that the public is not sort-changed in firms' pursuit of profit."[49]

The Stigler group's analysis also accepts the central proposition of this analysis, in that "[i]nsufficient competition and entry result in harms to investment and innovation."[50] In the

TABLE 3.1: BIG-DATA DIGITAL PLATFORM CHALLENGES TO WORKABLE COMPETITION

Scherer & Ross Workable Competition			**Stigler Antitrust Group**
Structure	Conduct	Performance	Big-Data Digital Platform
			Competition Challenges
The number of traders should be at least as large as scale economics permit.			**Minum Efficient Scale may be too lared to support vigorous competition**
		Profits should be at levels just sufficient to reward investment, efficiency, and innovation.	**Profits are excessive**
There should be no artificial inhibitions on mobility and entry.			**Pervasive natural barriers to entry result in tipping markets**
	There should be no unfair, exclusionary, predatory, or coercive tactics.		**Pervasice and much of it is beyond the reach of antitrust in a timely manner; a reguatory agency is necessary**
	Inefficient suppliers and customers should not be shielded permanently.	**Success should accrue to sellers who best serve consumer wants.**	**Potential entrant are excluded, extending the reach and lifespan of dominant firms**
There should be moderate price-sensitive quality differential in products offered.		**Firms' production and distribution operations should be efficient and not wasteful of resources.**	**Perverse incentive to increae quality undermines abiity to cmpete for low quality/prices customers, reduces choice and raises barrers to entry**
	Some uncertainty should exist in the minds of rivals as to whether price initiatives will be followed.	**Opportunities for introducing technologically superior new products and processes should be exploited.**	**Reduction in rivalry and elimination of potential entrants has reduced constraints on pricing and pressures to innovate.**
		Prices should encourage rational choice, guide markets toward equilibrium, and not intensify cyclical instability.	**Pricing refelcts maniputlation and exploitation under conditions of reduced rivaly**
	Output levels and product quality (i.e., variety, durability, safety, reliability, etc.) should be responsive to consumer demands.		**Bundling prcing and advertising structure demand an erstrict choice**
	Sales promotions should be informative, or at least not be misleading.	**Promotional expenses should not be excessive.**	**Advertising si excessive, manipulative and exploitative**
	Firms should strive to attain their goals independently, without collusion.		**Productsegmentation reduces rivalry**

Source: Workable Competition and the SCP paradigm are discussed in Scherer,

digital age, innovation plays a much larger part compared to price than it played in the policy space of the 2nd Industrial Revolution.

> The harm from lack of competition in digital markets will manifest itself in quality and innovation, as well as from higher prices to advertisers.… the impact on consumer welfare of a decline in innovation due to lack of competition is likely to be large, especially in the case of fast-moving technologies that affect many consumers and related businesses.[51]

The Stigler antitrust group report recognizes that measuring the impact on innovation is difficult. However, effects of anticompetitive conduct or market structure that reduces entry are so important that the antitrust approach needs to "recalibrate" to give much greater weight to potential competition. Although "recalibration" may sound like a timid approach, as discussed below, the changes recommended are quite extensive, while remaining within the U.S. antitrust tradition.

The Stigler report also recognizes that antitrust addresses one issue area, "market structure and competition," while a different framework is needed to address other issues like "politics, media, and the nature of privacy."[52]

DIGITAL PLATFORMS

Digital platforms pose a unique challenge for competition and antitrust for a variety of reasons. Table 3.2 is constructed to highlight the tension in the analysis of the Stigler antitrust group, which mirrors the tension in the digital political economy. Here we have a litany of supply-side structural characteristics that explain concentration and market power, and an equally long litany of demand-side characteristics that explain the immense ability of the seller to exploit their market power. The irony is that many of the characteristics of digital markets that pose challenges to competition and antitrust are the source of the efficiency of the new form of industrial organization.

First, as shown in the upper left (Section A), the new form of organization that generates a great deal of surplus also tends toward high levels of concentration and barriers to entry.

> These markets often have extremely strong economies of scale and scope due to low marginal costs and the returns to data. Moreover, they often are two-sided, have strong network externalities and are therefore prone to tipping. If so, the competitive process shifts from competition *in* the market to competition *for* the market. This combination of features means many digital markets feature large barriers to entry. The winner in these settings often has a large cost advantage from its scale of operations and a large benefit advantage from the scale of its data. An entrant cannot generally overcome these without either a similar installed base (network effects) or a similar scale (scale economies), both of which are difficult to obtain quickly and cost-effectively.[53]

Second, behavioral imperfections (Section B) are highlighted in Tables 3.2. They have been recognized for several decades make these markets very vulnerable to the accumulation and abuse of market power by dominant firms.

TABLE 3.2: CHALLENGES (MARKET IMPERFECTIONS) TO COMPETITION AND ANTITRUST FROM DOMINANT, BIG DATA DIGITAL PLATFORMS

A. Market characteristics increase surplus but weaken competition (1) Average cost is too low (2) Quality costs are too high (3) Transaction costs are too low (4) Advertising costs are too low (5) Advertising value too effective for some (6) Increased output v. allocation of output (7) Direct network effects are too large (8) Indirect network effects are too large (9) Data is non-rivalrous and increasing in marginal values (10) Expansion costs (local and global) are too low **B. Consumer behaviors that contribute to entry barriers abuse by dominant firms** (11) Inherent behavioral biases (12) Data is open to manipulation and exploitation (13) Machine learning is uniquely powerful (14) Lack of availability of Information to consumers (15) Failure to research and compare (16) Complex, opaque transactions (17) Consumer preference v. welfare (manipulation)	**C. Traditional conduct that reinforces market power** On the supply-side (18) Limit openness and interoperability (19) Lack of transparency (20) Exclusion or degradation of services (21) Resist data portability (22) Behavioral economics used to exploit consumers On the demand-side (23) Pricing (loyalty and to zero) (24) Contracts (25) Bundling (26) Lack of transparency (27) Increasing switching costs (28) Sunk costs/asymmetric information increase **D. Policy that facilitates or fails to address market power** Lax antitrust enforcement (29) Structure (mergers) (30) Conduct (fraud and abuse) Lack of regulatory authority (31) Ineffective (privacy) (32) Absent (big data exploitation) (33) Severe challenge of assessing welfare

Source: Based on Stigler Center, 2020

> Additional barriers to entry are, ironically, generated by the very consumers who are harmed by them… In general, the findings from the behavioral economics literature demonstrate an under-recognized market power held by incumbent digital platforms.
>
> The role of data in digital sectors is critical. Personal data of all types allows for targeted advertising to consumers, a common revenue model for platforms. The report shows that the returns to more dimensions and types of data may be increasing, which again advantages incumbents. Consumer data in the United States is not regulated in any way that gives useful control or privacy to consumers, and additionally, most consumers have little idea what is being collected about them and re-sold. One way in which digital platforms often exploit their market power – and increase their profits – is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing, but which give the platform freedom to monetize consumers' personal data.[54]

The behavioral economics present a different, and in some ways greater, challenge to traditional antitrust.

> Behavioral economics magnifies the anticompetitive potential and harm of platforms. Consumer biases are vulnerable to big data and competition is not the solution, since the marketplace – demands exploitation for competitive survival because "staying profitable in a competitive environment may force firms to exploit behavioral biases to achieve maximal profitability. Firms abstaining from doing so may be driven out of the market... rais[ing] broader consumer protection concerns that cannot be solved through greater competition.[55]

Behavioral economics challenge the fundamental assumptions about consumer behavior and call into question the antitrust enterprise, which seeks to clear away the supply-side market imperfections that are believed to frustrate the actions of welfare-maximizing, well-informed, effective, demand-side decision makers. If the motivations, capabilities, and tools used by consumers do not operate as the market paradigm assumed, the outcome will not be as expected, even if supply-side imperfections have been reduced or eliminated. The neoclassical view and antitrust were criticized for this failure long before big data platforms made matters much worse.

Dominant firms will "convince" consumers to stay put and prevent competitors from being able to convince them to move.

> Moreover, unlike traditional markets, where several quality layers may coexist at different price levels (provided that some consumers favor lower quality at low prices) markets were goods are free will be dominated by the best quality firms and others may compete only in so far as they can differentiate their offers and target different consumers. This strengthens the firm's incentive to increase quality through increasing fixed costs in order to attract customers (the Sutton sunk cost effect) and further pushes the market toward a concentrated market structure.[56]

Under alternative assumptions about consumers, who cannot be assumed to be perfectly rational, welfare-maximizing, knowledgeable, information-using actors, producers have the ability to manipulate consumers by studying and exploiting inherent biases in consumer action. Big data magnifies this potential exploitation and abuse by enabling those selling goods and services to gather data and analyze consumer weaknesses at an unprecedented level and depth. They do not just meet consumer needs; they create and exploit them. Consumer defenses, already weakened, are overwhelmed.

Thus, the Stigler antitrust group identifies a number of practices that can lock in consumers, raising barriers to entry and reducing competition.

> One way in which digital platforms often exploit their market power – and increase their profit – is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing, but which give the platform freedom to monetize consumers' personal data.
>
> Maintain complete control over the user relationship… can be used to reduce the possibility of successful entry by direct competitor. Exclusive contracts, bundling, technical incompatibilities.[57]

After explaining how these factors create challenges for antitrust, the document devotes its attention to seeking solutions. It begins with antitrust, but ends by acknowledging a sector-specific regulator will be necessary.

> However, because technology platforms present the enforcement challenges detailed above, even effective enforcement may not be enough to generate competitive digital markets in a timely fashion. Therefore, the report suggests that Congress create a specialist regulator, the Digital Authority. The regulator would be tasked with creating general conditions conducive to competition.[58]

If we conduct the intellectual exercise of assuming all problems in the right column of Table 9.3 are solved, then ask ourselves the following basic antitrust question, we come up with a surprising answer. Having eliminated the producer conducts that reinforce or exploit market power, could we leave the sector alone and let the big platforms do their thing? The answer is no, just as it was for the big communications corporations a century ago. The inherent tendency of capitalists in the sector – who are pursuing its efficiencies – is to concentrate and integrate. This creates huge barriers to entry and a dramatic reduction in competition. Without competition, innovation slows and the dominant firms collect rents from consumers.

> There is no tooth fairy; advertising supported services are not free. There are costs. Consumers pay with a reduction in their privacy and in the price of the goods that are advertised and the weakening if not elimination of competition, which reduces innovation and lowers quality. (33)

The right side of Table 3.2 identifies upwards of a dozen more "traditional" antitrust concerns that the Stigler antitrust groups find operating in big data digital platforms. This is not to say that traditional antitrust was incapable of easily dealing with these types of action. However, under the influence of free market fundamentalism, lax antitrust enforcement did not try very hard to prevent these abuses. In fact, the broad critique of free market fundamentalist antitrust identified and demonstrated many mistakes that have been made. Antitrust practice had already *Overshot the Mark.* [59] I argue that, in fact, they had totally missed the mark long before the new form of industrial organization had moved market reality even farther from the underlying assumptions – not only of free market fundamentalism, but also of a more reasonable view of market operation and performance. With well over a dozen severe challenges to traditional antitrust identified, the existence and importance of the more traditional substance of antitrust is magnified

Table 3.3. uses the issues identified in Table 3.2 to locate the analysis of Tim Wu's book on The *Curse of Bigness,* As shown in Working Paper #1 the original book is an important aspect of the Brandies Protocol, but is only one aspect. Table 3.3 underscore the fact that, a careful reading of Brandeis must recognize the complexity of the overall analysis. Wu is sensitive to this need in three important ways.

TABLE 3.3: CHALLENGES OF NEW TECHNOLOGY

STIGLER GROUP ON ANTITRUST AND REGULATION — TIM WU (*CURSE OF BIGNESS*, Pg. #)

Market Characteristics that increase surplus but weaken competition

	Antitrust Reform	Economic Issues
(1) Average cost is too low	128	15, 119,
(2) Quality costs are too high	129	120,123
(3) Transaction costs are too low	134	124, 125
(4) Advertising costs are too low		
(5) Advertising value (targeting) with large databases is too effective (for some/many)		
(6) Consumer preference v. consumer welfare		
(7) Increased output v. allocation of output		
(8) Direct network effect value for communications consumers is too		
(9) Indirect network effect value to producers of complements are too large		
(10) Local/global expansion costs are too low		

Traditional conduct that reinforces market power

	Antitrust Reform	Economic Issues
On the supply-side		119
(11) Limit openness and interoperability		
(12) Lack of transparency		
(13) Exclusion or degradation of services		
(14) Resist data portability		
(15) Consumer exploited by behavioral economics		
(16) Complex, opaque transactions		
On the demand-side		
(17) Pricing (loyalty and to zero)		
(18) Contracts		
(19) bundling		
(20) Lack of transparency		
(21) Increasing switching costs		
(22) Magnifying switching cost through sunk costs and asymmetric information		

Consumer behaviors that contributes to entry barriers abuse by dominant firms

	Antitrust Reform	Economic Issues
(23) Inherent behavioral biases	128, 135	112,120
(24) Data is open to manipulation & exploitation	137	123,125
(25) Manipulation of Consumer preference v. welfare		
(26) Machine learning is uniquely powerful		
(27) Lack of availability of Information		
(28) Failure to research and compare		

Policy that facilitates or fails to address market power

	Antitrust Reform	Economic Issues
Lax antitrust enforcement	16,17,18,	123, 132
(29) Structure (mergers)	32, 40,41,	133, 139
(30) Conduct (fraud and abuse) Lack of regulatory authority	42, 72	
(31) Ineffective (privacy)	123, 125	
(32) Absent (big data exploitation)	128, 130,	
(23) Severe challenge of assessing consumer welfare		
(34) Political impact of weak antitrust & absence of regulation		

Source: Stigler xx, Wu xx

First, he begins from an appreciation of the "big cases" under the Sherman Act. This is certainly the view of Brandeis, too. Second, he underscores the shortcomings of the act both in how it was vulnerable to abuse by market fundamentalists and how it must be powered up to deal with digital technology. Again, Brandeis understood the limitations of the Sherman Act and worked hard to improve it. Third, Wu recognizes that there is a great deal of other policy necessary. While he declares those beyond the scope of the short treatise in *The Curse of Bigness,* we find about three-dozen references to policies or issues that merit further attention. These fit within the Brandeis-Stiglitz framework for progressive capitalism that I have outlined above.

Simply put, while *The Curse of Bigness* is an important part – perhaps even the start – of the conversation among progressives, but it is certainly not the end. Regulation and other policies (e.g., taxation, social protection, innovation, etc.) are just as important in building a pragmatic, progressive political economy that, according to Stiglitz and Brandeis, must be based on decentralized competition and markets.

One aspect of the Brandeis/Stiglitz framework worth repeating and expanding here is the identification of market failures. As Stiglitz argue in the mid-1990s, there were three views (schools of thought) on market imperfections that led to market failure. The old view includes market failures generally recognized by economists, although it must be said that extreme market fundamentalists may not accept the widely recognized failures of the market or may not accept the proposition that there is much government can do about them. The second, newer view identifies a broader set of market failures that stems from the important role institutions and transaction costs play in determining the nature and performance of the political economy. If one contemplates the 50 years of economic theory that Stiglitz claims have fundamentally altered thinking about markets and their performance, one includes the new new view.

Here we add a fourth view, the newest imperfections that deserves attention --the behavioral view (see Table 3.4). Stiglitz noted it in his most recent book and it deserves special attention because it poses such a new challenge in the hands of Big Data Platforms. The biases are well known (Wikipedia identifies over 100), what is new is the ability to gather and analyze data on a real time basis to influence consumers. This power goes well beyond traditional "influence" to cross into the realm of manipulation and exploitation. The impact in economics is clear in the noble prizes awarded. There is a growing recognition that behavioral economics must affect regulatory and antitrust policy.[60] The Figure includes a couple of examples from both the general economic and the antitrust literatures.

TABLE 3.4: MARKET FAILURES AND CHALLENGES FOR POLITICAL ECONOMIES

MARKET IMPERFECTIONS	CHALLENGES FOR ALL POLITICAL ECONOMIES
OLD (Expanded)	
Public Goods	Public Goods Expanded
Externalities	Broad concept of externalities
Inequality	Inequality
	Redistribution
	Education
Weak (insufficient) Competition	Imperfect Competition expanded
	Information
	Barriers to entry
	Rent seeking
	Policy
NEW	
INSTITUTIONS	Institutions
	Banks
	Stock market
	Organizational structure
TRANSACTION COSTS	Transaction costs
	Monitoring & control
NEW, NEW	
Information	Innovation
Incomplete	R&D
Asymmetric	Technology
Costly	Resource Allocation
Incomplete Risk and Futures	Capital Allocation
Market,	Perverse Incentives,
	Moral hazard,
	Principle agent
	Non-economic
	Price- Cost
	Management independence
	Property uncertainty
	Coordination
NEWEST	Manipulation and Exploitation of Biases
BEHAVIORAL	to abuse market power
	Motivation: Non-economic
	Manipulability of preference
	Perception: Bounded & Social
	False confidence
	Calculation: Discount Rate
	Bad Math
	Execution: Limited Attention
	Limited Learning,

Source: Old, New and New, New from Joseph Stiglitz, *Wither Socialism,* (MIT, 1994); Behavioral that identify specific biases as leading to market failure and abuse of market power from: Jon D. Hansen and Douglas A. Kysar, 1999, "Taking Behavioralism Seriously, The Problem of Market Manipulation," *NYU Law Review,* 74,2000, "Taking Behavioralism Seriously, A Response to Market Manipulation, *Roger Williams University Law Review*,6 ; Avishalom Tor and William J. Rinner, "Behavioral Antirust: A New Approach to the Rule of Reason After Leegin, Avishalom Tor, *The Fable of Entry, Bounded Rationality , Market Discipline and Legal Policy.* These four sources are the tip of a very large ice berg and they identify two-dozen biases, about one-fifth of the total. .

4. THE NEVER-ENDING BATTLE WITH FREE MARKET FUNDAMENTALISTS

Not surprisingly, the long running debate between progressive capitalists and free market fundamentalists persists into the present critical juncture. While the Stigler antitrust group calls for "recalibration" to strengthen antitrust and recomposition of regulatory institutions, the antitrust and regulatory authorities in the Trump administration and market fundamentalists recommend the opposite. They argue that current oversight antitrust narrowly interpreted is adequate to deal with any problems that might exist and increased regulation would do more harm than good. Here we briefly discuss three examples that fit squarely in the analytic framework used throughout the working paper series. In the second and third working papers we showed that the FCC has essentially abandoned its regulatory role, executing what amounts to an administration repeal of the Communications Act of 1934. Here we focus on the antitrust agencies.

Less than a month apart, in June 2019, two Trump appointees to the federal antitrust agencies, both of whom has served in the Bush administration a decade earlier, laid out the case that antitrust, as it stood, was more than adequate to deal with the problems that were increasingly obvious in the digital communications sector. Enforcement that was lax before Trump as non-existent in his administration. In working papers #2 and #3 we noted that communication oversight had been all but eliminated by the adoption of a "Title 0" approach to non-discrimination and a zero competition standard for Business Data Services. Below we show a similar attitude of antitrust authorities.

THE DEPARTMENT OF JUSTICE

Makan Delrahim, head of the antitrust division of the Department of Justice, pointed back to Orrin Hatch, who Chaired the Senate Judiciary Committee at the start and height of the neoliberal period (1981-1987) for his inspiration. He stated that that "Vigilant and effective antitrust enforcement today is preferable to the *heavy hand* of regulation of the Internet Tomorrow."

In a piece entitled "Sorry, Mr. Delrahim: Big Tech's Worst Abuses Can't Be Cured Without Stiffer Regulation," Hal Singer, a prominent Washington economist with a long list of corporate and trade association clients, flatly rejected the claim (see Table 4.1).

He noted that "Delrahim's condemnation of regulation stands in contrast to a growing number of influential voices, including prominent antitrust practitioners, who not only want to steer antitrust in a very different direction but also want a supplementary or reinforcing role for regulation." He proceeded to identify a long list of behaviors that challenged the simple, antitrust can do everything view. The analysis, which parallels the Stigler group paper is summarized in Table 4.1.

THE FEDERAL TRADE COMMISSION

The analysis by FTC Commissioner Wilson reaches even farther back for its inspiration – to Edmund Burke, "[p]eople will not look forward to posterity, who never look back to their ancestors" and George Santayana, "[t]hose who cannot remember the past are condemned to repeat it." Wilson then presents a myopically distorted view of history.

TABLE 4.1: HAL SINGERS CRITIQUE OF THE DOJ CLAIM OF "JUSTICE FOR ALL: ANTITRUST ENFORCEMENT AND DIGITAL GATEKEEPERS

Bogus technological integration: "a technological tie-in that bolts a web browser with an operating system"
Inability to prevent abuse of bundling: "The Microsoft court was unwilling to unwind… bundling… on the flimsiest of efficiency defenses
Discrimination: "a platform's search algorithm that affords extra weight for affiliated properties of merchandise… which "under the antitrust laws…would be 'very difficult'"
Building barriers to entry: "appropriating content at the edge of their platforms and then using their platform power to steer users to the affiliated clones."
"Facebook has forced other sites to copy Facebook's privacy terms, but that just presents another entry barrier.
Treatment of exclusionary conduct: "the Supreme Court has… dramatically narrowed the reach of the Sherman Act
Difficulty of measuring harms: "Because the primary form of anticompetitive injury in *Microsoft* and any potential case against a modern tech platform would take the form of hard-to-measure innovation harms, securing a structural remedy via antitrust under current law would be challenging. It is not clear how to estimate a future loss in consumer choice due to exit by independents with any "measure of confidence."
Competition does not protect privacy: "[T]he very essence of Facebook's business model is the exploitation (and monetization) of user data. Adding a horizontal rival won't change how money is made in social media."
Perverse incentives: "It may not be in the second Facebook's interest to hold itself out as the privacy savior…Why would an entrant want to lure away Facebook's most privacy-sensitive customers, who are by selection the least attractive to advertisers?"
Inability to affect dominant firm behavior: "And even if the social media entrant did hold itself out as a privacy savior, it is not clear why Facebook would change is exploitative ways."
"[I]n the presence of switching costs and imperfect information, discrimination against similarly-situated edge rivals likely would still be profit maximizing, even in the face of modest platform competition."

Source: Hal Singer, 2020, Sorry, Mr. Delrahim: Big Tech's Worst Abuses Can't Be Cured Without Stiffer Regulation,"

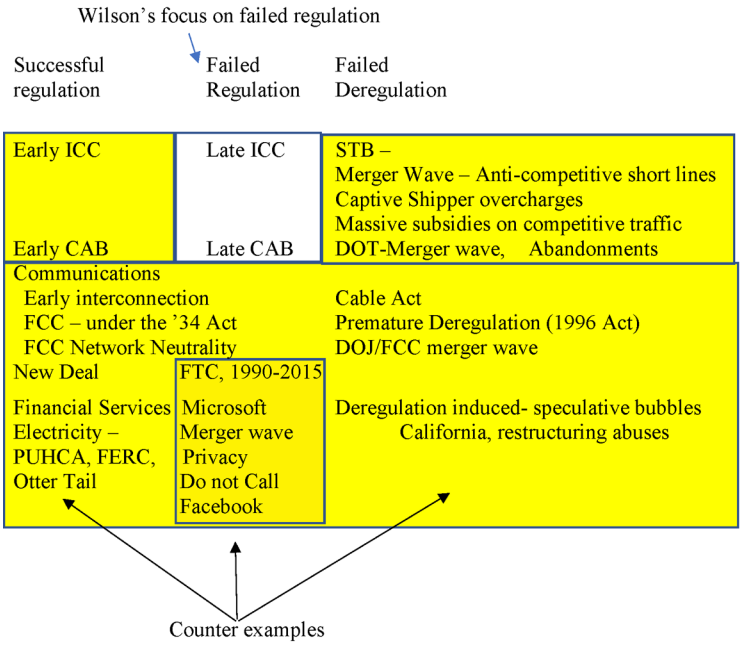
Wilson's simplistic cautionary tales of regulation are a highly selective and misleading subset of experience with regulation and deregulation. As shown in Figure 4.1 Complex reality includes many successful regulatory regimes, many unsuccessful deregulations, and the abysmal failure of the FTC to oversee digital services. She ignores the long-standing and strong consensus in the U.S. and Europe that vertical integration and leverage require much closer scrutiny, particularly in communications network and platforms than they have been given.

Wilson notes that "Starting in the 1970s, scholars increasingly recognized that the regulations distorted competition in the marketplace, reduced economic efficiency, and harmed the very consumers they ostensibly protected." She cites half a dozen studies of transportation, written before 2000, but ignores analyses of problems in the deregulated industries. She also ignores the vast literature on the other side. In the one area where she cites more recent literature, vertical integration, she repeats the highly contested claim that "vertical integration typically enhances economic efficiency, making force vertical deintegration economically inefficient and reducing consumer surplus in the long run.

Similarly, a speech Maureen Oldhausen, the First Chair of the FTC under President Trump, claimed that the abandonment of the Title II classification was tantamount to "Putting the FTC Cop Back on the Beat." It attacked the concept of network neutrality as implemented by the FCC, citing a decade old FTC report that claimed there was no problem that needed a regulatory solution. The speech made no reference to the history of the Internet and the

regulatory decision (Carterphone, the Computer Inquiries, Unlicensed Spectrum), that made it possible.

FIGURE 4.1: THE FTC'S TUNNEL VISION DISTORTS ITS EVALUATION OF REGULATION



Source, Wilson

AN ACADEMIC EXAMPLE

The selective and distorted vison of market fundamentalists is evident in a recent paper by Nicolas Petit. He tries to resurrect pure market fundamentalism through the introduction of "non-equilibrium markets" and/or "network effects markets in growth phase," which excuses all manner of anticompetitive conduct on the basis of uncertainty.[61]

At the highest level, the paper uses the Microsoft defense. If a firm says in its SEC filing that it faces competition, antitrust authorities are told to believe them and generally overlook actions they take to create, extend, or defend market power. As one Microsoft witness put it, the only thing that unequivocally constitutes anticompetitive behavior is if I burn down my rival's business.[62] The author's affinity for the Microsoft case is made clear toward the end of the paper where he says

> History is of little help. More than 20 years after the Microsoft antitrust saga, we still entertain doubts about whether Microsoft's anticompetitive strategies towards rivals were not a self-inflicted would. After all, a credible argument can be built that Microsoft "take-no-prisoner" approach to complement software applications led the Redmond firm to underestimate the commercial potential of nascent technologies, and incentivized the computer industry to move elsewhere leading to the emergence of Google, Facebook and myriad other firms.[63]

The author sets up a strawman that he uses to reject the very narrow traditional model of monopolist behavior, asserting incorrectly that the conclusions apply to oligopoly situations. A true and total monopolist would extract every penny of excess profits. The same Microsoft who said that only burning down the competition's facilities would count as anticompetitive argued that if Microsoft did not charge $600 dollars for its operating system (the maximum it could), it was not behaving like a monopolist, even though the price it charged ($150) was far above its cost.

The examples given – identical to Microsoft's defense – would excuse all of the behaviors that raise deep concerns for the Stigler antitrust group

> Non-equilibrium strategies are difficult to categorize as pro or anticompetitive. Think about cross platform integration of complements through M&A (**e.g.** Facebook's acquisition of Instagram), preferential treatment (**e.g.**, Google's integration of maps on its search engine and mobile OS Android), bundling (**e.g.**, Netflix's bundle of DVD and streaming subscriptions), imitation (**e.g.**, Amazon's cloning of merchants' products) or exclusive dealing (**e.g.**, app stores' bans on third party distribution). In a non-equilibrium environment, cross platform integration is a well-accepted strategy to grow network effects. At the same time, cross platform integration reduces reversibility, increases switching costs and exacerbates lock-in. This may deprive competing firms in non-equilibrium equilibrium markets from profit maximizing network externalities … or strengthen their incentives to invest into disruptive innovation and inter platform competition.[64]

Strategic and long-term behavior is ignored, as is the abuse of market power at the oligopoly level. Price discrimination (abusing market power at different rates in different categories of customers) is never mentioned, nor are multisided markets. The author shows they are not perfect monopolists and ignores monopolization of complementary product markets and strategic behaviors that enhance market power. In the strawman setting, the possibility of abuse of market power in a dynamic market where output is increasing is dismissed. Increasing output is taken as an indicator that there is little likelihood that market power is being exercised. Instead, antitrust authorities are told to only look at markets that have "tipped," but to be very cautious in concluding that the market has tipped. "Give low priority to anticompetitive conduct in "non-equilibrium markets." The result is to extend the under-enforcement bias – the error the Stigler group recommendation for recalibration is intended to correct.

The economic issue is the well-known type I error cost that arises when a firm in

> a competitive market type is deemed in a dominant position, and instantly subject to a specific set of legal constraints under the doctrinal concept of "special responsibility". The legal problem is that the conventional definition of dominance makes no sense in a non-equilibrium market with uncertainty.

The firms that the author analyzes bear little if any resemblance to the hypothetical market he describes.

> Nonequilibrium market power is absent – above cost pricing or other extractive practices are a moot problem in a non-equilibrium market (an overpriced service will instantly collapse to the 0 equilibrium), they are a possible source of deadweight loss in an equilibrium market…
>
> a firm confronted with a network effects markets in growth phase is to some extent dependent on marginal users' adoption choices (by contrast, the firm's existence is not at stake when the demand curve slopes downward). If we believe that unilateral anticompetitive conduct is possible in non-equilibrium markets, the definition does not help and creates a type II error. (34-35)

At the end, the author assures the reader that the abuses that have attracted so much attention are theoretically possible. However, reaffirming the long-standing error of market fundamentalist antitrust, these are to be given "lower priority." The empirical history we have reviewed and the analysis of the Stigler antitrust group strongly supports the opposite view. As the following table shows, each of the antitrust responses identified in Table 4.2 is either rejected or ignored by the market fundamentalist view.

TABLE 4.2: ANTITRUST CHALLENGES UNADDRESSED BY MARKET FUNDAMENTALIST THEORY

Stigler Group Challenges	Free Market Fundamentalist sidesteps
Understand innovation process better	Ignored (differential investment strategies)
Recalibrate perception of risk,	Rejected
Speed oversight by shifting burden, presumptions	Rejected
Clearer thresholds	Rejected
Attention to small firms, Protect competition	Ignored (merger example)
Reconsider duty to deal (P)	Rejected (exclusives example)
Data barrier to entry (i.e. portability)	Ignored (merger example)
Separation of data	Ignored (merger example)
Study implications of multi-sided,	Absent
Understand barter better (P)	Absent
Understand behavioral biases & their exploitation	Absent
Understand conflicts of interest in multisided	Ignored
Understand consumer welfare in multisided (P)	Ignored
In light of competitive, reexamine pricing	Rejected (assume absent if rising product and/or margin)
In light of competitive, reexamine product)	Rejected (integration example)
Eliminate safe harbor for exclusive dealing	Rejected (exclusives example)
Prohibit terms raising switching costs	Rejected
Unbundling, maximize consumer choice	Rejected (bundling example)
Multiple agency oversight of mergers (L)	Ignored

Source: Baes on Stigler Center, 2020,. xx

The problems they identify are very real and the assumptions used to excuse them are totally unrealistic.

> Make no mistake. Our suggestion is not to introduce a rule of per se legality for nonequilibrium markets with uncertainty. In non-equilibrium markets, firms may have ability and incentives to reduce uncertainty in ways that are anticompetitive. Moreover, firms that operate at a higher point of the upward sloping demand curve may try to protect relative competitive advantages by recourse to anticompetitive means. Put simply, we do not exclude that anticompetitive conduct can occur on the road to equilibrium. There should remain regulatory ability to enforce applicable competition law in such markets, though this should be subject to lower priority attention for enforcers.[65]

Petit claims to have shown that FANG (Facebook, Amazon, Netflix, and Google) "would outperform textbook monopolies by observable metrics of price, output, labor, or innovation." That is not the issue. The question is: Do these firms perform like a workably competitive market? The answer is no. Several observations are in order.

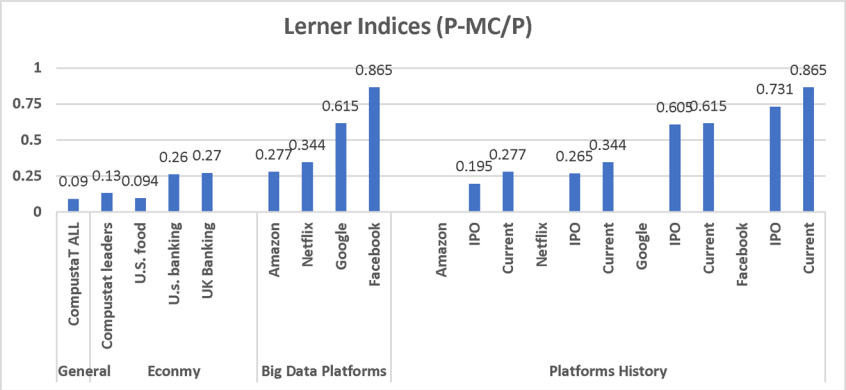
First, a quick glance at the paper shows the author adheres to the view that, as long as output is expanding, there cannot be abuse of market power that policy should respond to. The Stigler antitrust group disagrees.

Having liberated the data from the market fundamentalist ideology, the data used in the paper to test the ill-fitting monopoly theory are useful to ascertain whether there are excess profits – the traditional measure of antitrust harm. Figure 4.2 presents a standard calcuation of the Lerner index (used in the Working Paper #3). This is a standard measure of the markup of price over cost. The figure compares Lerner indices for general economic goods.

Second, note the dramatic difference in the Lerner indices between Amazon/Netflix versus Google/Facebook. One can argue that the first set was entering into markets that were occupied (product distribution/video). Their pricing power was much more constrained, although Amazon has obtained much more horizontal size and is adding complements. Google and Facebook entered primarily new spaces (search and social media) where we might expect these firms to earn innovator (Schumpeterian) rents when they are introduced, but we would also expect those rents to be dissipated as competition is attracted to the sector. Facebook's margin increaed 10% when it acquired WhatsApp and has continued to rise.

Third, the behaviors that the author cites as "complicating" the competition analysis are very different between firms. Netflix is said to have engaged in a very weak form of bundlig (i.e., the bundle is mixed, with each of the piece parts readily available in the market). Amazon is engaged in online products. Facebook's merger with Instagram is mentioned (but WhatsApp is not). Google is said to have integrated maps and Android. Digital distributors (certainly Google and Facebook) exclude third-party apps.

FIGURE 4.2: LERNER INDICIES: GOODS AND SERVICES COMPARED TO BIG DATA PLATFORMS



General, Based on Compustate; Platfroms base on Petitit

EXPANDING THE SCOPE OF ANTITRUST AND REGULATION TO INCLUDE INSIGHTS FROM THE FULL RANGE OF SOCIAL SCIENCES

The caution in the antitrust approach raises the question of what changes are necessary to bring the overall landscape of policy into a position to deal with the digital revolution. In fact, four decades ago, Lawrence Sullivan pointed the way forward for antitrust. Antitrust practice never did take up the challenge. Sullivan's early observations provide solid advice for the regulatory institutions that are necessary today.

A 1977 article by Lawrence Sullivan, who appears to have originally identified the Harvard law school side of Chicago/Harvard debate, started with a prescient discussion of the key differences. The Chicago School viewed monopoly as rare, cartels as unstable, barriers to entry as low, and pricing strategies (like vertical restraints and tying) as overwhelmingly efficiency-based. Market participants were assumed to be highly functioning economic actors. Efficiency was the only goal to be pursued by antitrust. Under these circumstances, overcharging consumers was, at best, very short term, since entry and economics would dissipate rents quickly. The Harvard School raised doubts about each of these assumptions.

> This tradition, here called the "Harvard school"… is less likely than is the Chicago analysis to attribute oligopolistic industry structure to scale efficiencies. Harvard theorists recognize other barriers to entry, such as control of scarce resources, high capital requirements, and product differentiation…. Harvard theory envisages the additional possibility of non-collusive but interdependent pricing in oligopolistic markets. Also, Harvard theorists sometimes use dynamic models suggesting ways in which foreclosing restraints like tying, requirements

> contracts, or vertical mergers may injure competition. Thus, they perceive the possibility that vertical relationships may inhibit entry. They also regard certain characteristic aspects of competitive style, such as high advertising expenditures, as capable of dampening competition either by increasing capital requirements for entry, or by increasing product differentiation and, thereby, tending to disaggregate markets. The Harvard school is more likely than Chicago to view resale restrictions as pernicious.[66]

The focus of the 1977 article was not so much on the fact that the Chicago assumptions were wrong, which Sullivan believed the Harvard School had demonstrated convincingly, but on the best way to study the implications of the much improved understanding of the more complex reality of the market that emerged from the debate. This called for a broader social science of industrial organization in which antirust and regulation played important roles.

> The debate over the nature and goals of antitrust established by the Sherman and Clayton Acts is a political debate of the highest order, since the setting of goals is a quintessentially political act. The Chicago School argued for total social surplus as the goal, disregarding the distribution between consumers and producers. The Harvard School took the view that the primary target of antitrust was consumer surplus. The implications of the two different standards are profound in terms of the conduct that would be considered a liability under the antitrust laws. After three decades of debate, the Harvard school declared a substantial victory, arguing that the courts had generally applied a constrained consumer surplus standard with the constraint being a demonstration that consumer harm was modest compared to efficiency gains that were quite large.[67]

Sullivan criticized the Harvard School for not building a robust framework to describe the outcome of markets, offering observations on a broader view of antitrust issues. His criticism of the neoclassical Chicago School was that it is focused on a narrow set of economic issues – namely economic efficiency. He argued that the Harvard School was much broader, but still too focused on economics and failed to bring other disciplines into the analysis. History and philosophy were mentioned – the former to add a qualitative grounding, the latter to provide values and goals – but the analytic disciplines he advocated were sociology and political science.

His critique of the doubly narrow Chicago view was essentially that institutions and behavior had a much greater influence on the working of the economy than the neoclassical economists admitted. The Harvard School was better, but it did not go far enough because it put structure in the driver's seat. He argued that conduct was at least an equal copilot, if not the captain. While many had argued that Bork's effort to narrowly focus antitrust on efficiency was simply wrong as an interpretation of the Sherman Act, Sullivan grounded that conclusion in a political economy analysis of the economic system into which the Sherman Act was introduced.

> The scale of industrial activity expanded rapidly and dramatically and as it did so, the scale and scope of political and community life expanded in reaction. All of this yielded the tensions and ambivalences that are inevitably associated with profound changes in the conditions of life. The Sherman Act took form in that atmosphere. It was, indeed, one of the few significant American governmental

> responses to the transformation of American life resulting from economic development during the last decades of the nineteenth century. No one who knows anything about life or politics could expect to find theoretical rigor or doctrinal purity in such a statutory instrument… The Sherman Act is seen most fully as one product of that dialectic. The Act was invoked by the same kinds of social and political pressures as those to which Populism and the Progressive Movement responded, each in its unique way.[68]

This description of a new political or ideological theme added to American policy by the Sherman Act is consistent with the view of the development and evolution of antitrust offered in WP#1. His critique of the Harvard School is that it failed to live up to that tradition. As a result – and as the Stigler antitrust group shows – antitrust has a lot of catching up to do. Sullivan's observations were prescient in linking that failure to the contemporary need for "recalibration," beginning with the flaws in the Chicago School approach.

Having offered a grounded historical political economy of antitrust and explained the importance of this type of historical analysis, he focused on sociology as the discipline that might make the greatest contribution to the understanding of market performance and the role of antitrust.

> My thesis is that antitrust scholarship could usefully explore the styles of analysis and some of the material from the humanistic disciplines of history and philosophy, and that it might be useful to draw upon social sciences other than economics, particularly on sociology and political science. (1214)

He questions the "cultural validity of basic presumptions, such as that firms are profit maximizers and individuals maximize utility,"[69] noting that the assumptions neuter analysis of conduct and result in an obsession with market structure and a failure to examine conduct.[70] The blind spots are of great importance, most notably in the "[t]reatment of monopoly pricing [which] reveals the faults of a rigorous economic approach that values generalized analysis of structure above inquiry into human conduct and the disorder of the market"[71] and the failure of Chicago analysis to examine long-term and strategic action.[72]

The implications of Sullivan's analysis are profound along a number of dimensions. One dimension is a broader view of the role of antitrust, which expands it beyond the narrow, efficiency-orientated approach of the Chicago School – a point that was hammered home intensely in the debate over the goals of antitrust. Just as the recognition of the historical context of the Sherman Act went a long way toward defining the view of its goals, shifts in contemporary society influence the direction that antitrust should take today.

> Americans today live out their lives in a vastly different world than that of their fathers and grandfathers. The social, political and economic institutions through which they express themselves are almost all on a larger scale now than they were at the end of the last century. Many of the forces that now affect them are less personal, more remote, than they used to be. A people may care about these changes as well as about changes in efficiency and market power. They may expect policy about industrial structure to deal with their concerns, and it would

> be incongruous to suppose that antitrust would not reflect such solicitude….
> The changing perceptions of and attitudes about antitrust that ultimately affect its content… are interrelated with changes in social and political attitudes that have affected other American institutions as well.[73]

Sullivan returns the political to the central role in political economy.

> The political consensus that supports antitrust comes from other sources. Americans continue to value institutions the scale and the workings of which they can comprehend. Many continue to value the decentralization of decision-making power and responsibility. Many favor structures in which power in one locus may be checked by power in another. Antitrust, broadly perceived and sensitively administered, may contribute to the realization of these values. So, doing, it may reduce various of the pressures for fuller governmental regulation of commercial and industrial activity.[74]

One of the greatest shifts noted by Sullivan is the interplay between antitrust and regulation. The political economy view of antitrust taken by Sullivan focuses on the limitation of antitrust and the need for regulatory institution.

> One can no longer assert that antitrust is the major governmental intervention aimed at dealing with industrial transformation and its social effects. For the last fifty years or so the nation has implemented various regulatory programs, has socialized many activities and has used the taxing and spending power to affect economic conduct and performance.[75]

Given the date of Sullivan's article, the fifty-year period he points to in the development of regulation reaches back to the enactment of the Radio Act of 1927 – the precursor to the Communications Act of 1934 – as well as the other regulatory policies of the New Deal.

Sociology was the social science to which Sullivan devoted the most attention, underscoring its significant role in bolstering and improving antitrust analysis and policy. "If, as suggested above, the contemporary importance of antitrust lies primarily in its relation to the social and political dynamic through which power is allocated, sociology may contribute to an understanding of relevant relationships."[76] The broad suggestion was that individual behavior was located within institutions that drove conduct.

> The antinomies of conflict and consensus, stability and change, bureaucracy and democracy have been among the classic concerns of sociology. Contemporary sociological research deals with many issues relevant to antitrust. Organization theory, the social aspects of economic development, social differentiation within business organizations, and the ways in which differentiation relates to organization size and related variables, the politics of bureaucracy, and theory about the way norms and values are legitimized and transformed all have potential significance.[77]

At the time, new institutional and behavioral economics were in their early stages of systematic development. He argued that these disciplines held great promise, but they needed to develop, as they did.

> Sociology may, in time, be able to make direct contributions to antitrust, much as does economics today. This literature focuses upon relationships between organizations and their environments and seeks to analyze the ways in which organizations modify and are modified by their environments.
>
> Biological, evolutionary organizations cannot generate internally all the resources needed to survive and that the ultimate goal that explains both changes in organizational structure and changes in the environment initiated by the organization is the need to attract resources from the external environment.[78]

That is not to say that antitrust has no role to play, or that the expanded list of goals antitrust should pursue or considerations it should take into account has been agreed upon. On the contrary, this has been a source of continuous debate, as Sullivan recognizes.

> The contemporary significance of antitrust, like its past significance, lies primarily in the role it continues to play in the working out of those political and social issues. To argue, as do the Chicago economists, that antitrust ought to be used solely to inhibit expressions of market power in a technical economic sense, is not only to miss much in the history and development of the law, but to ignore much of its potential.[79]

5. ANTITRUST AND REGULATION FOR THE DIGITAL AGE

JUSTIFICATION FOR OVERSIGHT

Turning to policy, it is important to understand the numerous factors that justify policies to control the abuse of market power in the digital communications sector to promote competition and protect consumers. Making the case for economic regulation, Alfred Kahn pointed to the fact that because communications networks exhibit economies of scale, the market will support only a small number of large firms compared to other sectors of the economy.[80] In addition, because of the essential inputs these large firms provide, they influence the growth of other sectors and the economy.[81] They are infrastructure.

Kahn's description of the rationale for regulating infrastructure encompasses three major economic principles. He starts with what is essentially a positive externality – a public goods argument. The broad economic impact means that private individuals might not see the benefits, or might be unable to appropriate (capture) that value in the form of profits, so they will invest less in the provision of service than is socially justified. In addition to this macroeconomic impact, those who are unserved or priced out of the market are disadvantaged at the individual level. Capitalists won't serve them because they are not typically profitable.

An extension of this argument for the communications network involves achieving ubiquitous, seamless interconnection and interoperability, which is not a likely outcome of market forces alone.[82] Ubiquitous, seamless interconnection and interoperability are highly desirable characteristics of infrastructure networks that achieve important network effects, another positive externality.[83] Competitive communications and transportation networks do not inherently produce this outcome because of the perverse incentives of dominant providers of bottleneck facilities,[84] and because the high cost of negotiating interconnection creates obstacles to seamless interconnection. Government policy has repeatedly been forced to step in to achieve the desired outcome.

Kahn added two other characteristics as potential justifications for regulation: "natural monopoly" and "for one or another of many possible reasons, competition does not work well."[85] Although Kahn was skeptical of the monopoly rationale for regulation, he later argued that the nature and extent of competition is an empirical question:

> The question is not simply one of *how much* competition to allow—how much freedom of entry or independence of decision making with respect to price, investment, output, service, promotional effort, financial, and the like. It is a question also of what, in the circumstances of each regulated industry, is the proper *definition,* what are the *prerequisites*, of effective competition.[86]

Establishing the preconditions for competition is a policy action that greatly affects the outcome, but the ultimate outcome, the actual growth of competition that prevents the abuse of market power is what matters most. Two decades after the passage of the Telecommunication Act of 1996, which aspired to supplant regulation with competition, the critical question is not, "Is there more competition?" Rather, the question is, "Is there enough competition to prevent abuse?" This analysis shows that the answer must be a resounding no.

The second rationale offered by Kahn is a market structure problem. Very large economies of scale mean that building multiple networks raises costs. The market will not support competition. In the extreme, we run into the problem of a natural monopoly. Firms that become too large behind high barriers to entry, transaction costs on the supply-side, high switching costs or other behavioral flaws on the demand side, obtain market power. Monopolists (natural or otherwise) have market power and there is a strong incentive to abuse it. With the incentive and ability to exercise it, they engage in behaviors that harm competition (by creating additional obstacles to entry or extending their market power to complementary markets) and consumers (raising prices and restricting choices). Regulation controls market power. However, monopoly is not the only reason to implement public policy. It has never been a necessary condition to impose common carriage in the communications and transportation sectors.

Infrastructure industries exhibit several market structural problems. They deliver service with relatively low elasticities. In fact, they can be considered "necessities" since they have a combination of low-price elasticity and moderate-income elasticity.[87] The low-price elasticity means it is difficult to go without communications or find good substitutes. The moderate-income elasticity means the good commands a significant part of the household budget all the way up and down the income distribution, but the percentage declines as income rises. The important role of communications in the broader economy and for households magnifies the ability to exercise, as well as the impact of, the abuse of market power.[88]

Deployment of facilities to compete with an incumbent communications network is costly and difficult. Network effects – the ability to reach large numbers of customers to make the network more valuable to each individual customer – are important. Therefore, the communications sector provides a fertile ground for the abuse of market power. Its size, great importance to the functioning of the economy, and underlying economic characteristics suggest that the existence and persistence of market power is a problem. It has made this sector the target of a great deal of public policy.[89] Elasticities of demand and supply are low compared to other sectors. The key services supplied to consumers in the digital communications sector (broadband and wireless) exhibit the elasticities of necessities.

Social Values

We turn next to Kahn's third reason for regulation – "other." Although it is less specific, it can be given several referents in the communications space. Competitive markets do not deliver universal service because there are significant parts of society where the rate of profit does not support extending the infrastructure or making it affordable. Rural/high-cost areas and low-income populations may not be very attractive from an investment point of view, but they are important from a public policy/social values point of view.

Freedom and diversity of opinion and voices are extremely important socio-political values that may not be accomplished by a competitive market. They may or may not be profitable, but society simply cannot leave them to the vagaries of the market. Speech and diversity are perhaps the most important examples of these values.[90] Communications is well-recognized as a key to democracy, and many consider it a human right.[91] The challenge is not simply to ensure that all have the opportunity to speak, but also to address gross imbalances in those opportunities. Many citizens deserve more speech than the market affords them.

COMPLEXITY, CHALLENGES AND CORE PRINCIPLES

This paper describes focuses on the big, digital platforms that have become bottleneck firms that dominate a new choke point in the digital communications sector. WP#2 and #3 analyzed the challenge of the big broadband networks that were an obstacle to the development of digital communications in the birth and initial deployment of the Internet.

The policy principles that we have shown were successfully applied in that earlier period are the same as the principles needed today. Of course, the details of the policy change with the technology, but its principles are the same.

The Stigler group provides crucial analysis with its very comprehensive examination of issues. The Stigler group's approach is pure Brandeis, as described in Working Paper #1.

- It launches from a detailed economic analysis as it affects antitrust,
- endeavoring to make competition and markets work better.
- It examines the single largest social issue and economic issue arising in the digital age— privacy and the use of data—and
- discusses one of the most important mainstays of the democratic political economy (journalism), as well as the broader impact of digital technology on democracy.
- It seeks policies that set clear goals, identify the most important issues, and remove barriers to effective implementation, but it relies on the practice of experts to identify how to implement specific policies to achieve those goals.

The Brandeis-Stiglitz model of pragmatic, progressive capitalism meets the challenge, by doing the following:

- It seeks to construct guardrails and guidance to promote competition and innovation in decentralized markets, and
- Orients capitalism in a direction that promotes and furthers the fundamental economic, social and political values of society,
- while ensuring consumer benefits and providing consumer protection.
- The process must be pragmatic and flexible to accommodate the dynamic economy, based on analysis of the real-world functioning and impact of each sector.
- It should be implemented by experts who have not only the skill, but the authority and resources to implement policy to pursue the goals.
- Political developments should be democratic and participatory, endeavoring to have political development support evolving economic structure.

Given the focus of this paper on the intersection of the political and economic elements of the model, Table 5.1.1t uses the issues identified by the Stigler group (shown in the left-hand column), to organize the discussion of policy responses shown in the two right hand columns. This underscores the need for a complex approach to the oversight of the revolution wrought by digital technology. The left column identifies the changes in antitrust that the group deemed

necessary. The right column identifies the authorities and issues that constitute the portfolio of the new regulatory agency. Here, legislation is necessary. There will be a debate over where the legislation should draw bright lines and where agency practice should be developed.

TABLE 5.1: OVERSIGHT OF BIG DATA DIGITAL PLATFORM, ANTITRUST REFORM AND A NEW REGULATORY AGENCY

CHALLENGES OF NEW TECHNOLOGY	STIGLER GROUP ON ANTITRUST AND REGULATION ANTITRUST REFORM	A NEW REGULATOR
Market Characteristics that increase surplus but weaken competition		
(1) Average cost is too low (2) Quality costs are too high (3) Transaction costs are too low (4) Advertising costs are too low (5) Advertising value (targeting) with large databases is too effective(for some/many) (6) Consumer preference v. consumer welfare (7) Increased output v. allocation of output (8) Direct network effect value for communications consumers is too (9) Indirect network effect value to producers of complements are too large (10) Local/global expansion costs are too low	Understand innovation process better (P) Recalibrate perception of risk; false positive v. false negative (P) Speed oversight by shifting burden, evidentiary presumptions, decision frameworks in merger review (L) Clearer thresholds (P) Attention to small firms (L) & Reconsider duty to deal (P) Data barrier to entry (i.e. portability) Separation of data	*Ex ante*, forward looking rules preempt harmful effects Complementary role Speedy deadlines, lower burdens, joint responsibility especially for behavioral remedies Clearer boundaries of unacceptable conduct potential leapfrog competition (P) Data portability (with consideration for data protection)8. Separation of data Study implications of multi-sided
Traditional conduct that reinforces market power		
On the supply-side (11) Limit openness and interoperability (12) Lack of transparency (13) Exclusion or degradation of services (14) Resist data portability (15) Consumer exploited by behavioral economics (16) Complex, opaque transactions On the demand-side (17) Pricing (loyalty and to zero) (18) Contracts (19) bundling (20) Lack of transparency (21) Increasing switching costs (22) Magnifying switching cost through sunk costs and asymmetric information	Supply-side In light of competitive, reexamine: pricing (e.g. zero and loyalty discounts) product design in light of competitive effects (P)	Demand side Prohibit terms raising switching costs (take it or leave it contracts) Unbundling, maximize consumer choice
Consumer behaviors that contributes to entry barriers abuse by dominant firms		
(31) Inherent behavioral biases (24) Data is open to manipulation & exploitation (25) Manipulation of Consumer preference v. welfare (26) Machine learning is uniquely powerful (27) Lack of availability of Information (28) Failure to research and compare	Understand better better (P) Understand behavioral biases & their exploitation (P) Understand conflicts of interest in multisided (P)	Date Protection Agency Fair information practices Effective choice Algorithmic transparency Define & enforce effective consumer choice
Policy that facilitates or fails to address market power		
Lax antitrust enforcement (29) Structure (mergers) (30) Conduct (fraud and abuse) Lack of regulatory authority (31) Ineffective (privacy) (32) Absent (big data exploitation) (23) Severe challenge of assessing consumer welfare (34) Political impact of weak antitrust & absence of regulation	Multiple agency oversight of mergers (L) Protect competition (L) Need to become more aggressive In enforcement (P)	Multiple agency oversight of mergers Promote competition, monitoring and enforcement of behavioral remedies and firewalls Open standards and interoperability Experience with active, *ex ante* preventions of discrimination, limits on market power, define and break bottleneck power and foreclosure. Non-competition digital goals: experience with universal service, local and diverse ownership, customer proprietary network information New roles in data use restrictions, consumer protection. Pro competitive rules for consumer control of personal data Algorithmic oversight

Sources: *Stigler Committee on Digital Platforms,* April 2020

The Stigler group recommendations for antitrust reform concludes that "It is time for antitrust law to recalibrate the balance it strikes between the risks of false positives and false negatives." "Recalibration" may sound like a timid response, but there are a number of ways in which it is profound. In addition to the major changes identified above, the Stigler antitrust group will also let a new regulatory agency handle many issues that would frustrate antitrust. This is the pattern we have pointed out in the New Deal as the launchpad for the Golden Age of Capitalism. Antitrust law was not substantially amended, but enforcement was ramped up dramatically while over a dozen other policies were adopted and new regulatory agencies created.

At the same time, the Stigler group's recommendations reflect a belief in the overall success of the Sherman Act approach and its flexibility to deal with economic changes. They tie this to the link to common law, an issue that I noted earlier. The Stigler antitrust group notes that the preference for legislation over practical evolution is a close call. The significance of the proposed recalibration can be appreciated from another perspective. As the Stigler antitrust group points out,

> With few exceptions, antitrust law has in the past evolved in a common-law-like process by which it has reflected new learning and judicial and market experience. This process is continuing, at least to some extent, as antitrust law and enforcement have recognized, for example, previously unnoticed competition problems in labor markets and doctrine has evolved to incorporate new learning about competitive problems that can be created by most favored nation (MFN) and other vertical agreements. The challenges posed by the big technology platforms and the current populist political climate have, however, put the issue of antitrust reform before Congress in various legislative proposals. There are advantages and disadvantages to both common law evolution and new legislation. Evolution by a common law-like process takes time.[92]

ANTITRUST STRUGGLES WITH COMPLEX, BEHAVIORAL REGULATION

It is important to begin with an appreciation for the recent experience of the antitrust agencies. In general, antitrust authorities take action after a harm has occurred and seek to stop the abuse and/or restore competitive conditions. One way to appreciate why antitrust alone is not enough to promote the conditions necessary for innovation is to consider the only circumstance where antitrust is called on to take preventative action – merger review. In merger review, the agencies project the likely impact of a merger and can take action to block or modify the merger and prevent the harm from occurring.

John Kwoka's analysis of antitrust oversight of mergers provides a useful starting point for the discussion in this chapter.[93] While Kwoka's analysis can be criticized on a number of grounds, some of the clearest conclusions are informative for the purpose of this analysis. The notion that behavioral remedies are not as effective in response to mergers is long-standing and not very controversial. The advice on when and how to use conduct remedies points directly to the complementarity of antitrust and regulation.

Antitrust agencies must resort to conduct remedies when divestitures will not work, efficiencies are large, and/or vertical integration is the question. This situation typifies the network platform industries in general, and digital platform communications networks in particular. Given the overwhelming role of such platforms, antitrust is ill-suited to deal with the underlying market power. Historically, as we have pointed out, U.S. policy explicitly subjected key communications infrastructure industries to the dual jurisdiction of antitrust and regulation for precisely this reason.

Kwoka's advice for how such remedies should be structured – transparency, simplicity, and third-party oversight – points to regulation, especially in dynamic industries. The key is that the "intended beneficiaries of access provisions [must not] find it difficult to fully or quickly obtain the necessary access."[94] In our view, bans on specific actions are likely to be the most effective because "important characteristics of effective remedies would seem to be simplicity and transparency." Third-party (e.g., regulatory commission) oversight is important in creating "[f]irewalls to constrain the exchange of competitively sensitive information… Recording explicit communications may help enforce the necessary discipline." Third-party oversight is also necessary because "[w]ithout an outside monitor, target firms may be reluctant to complain since they will continue to have to deal with offending firm."

Doubts about antitrust's ability to effectively implement such an approach continues to rage. The view taken in this paper is that we do not have to push antitrust to or beyond its limits. We can rely on the well-defined, century-old complementarity between antitrust and regulation in the communication space, adapting it to the dynamic digital environment.

One further observation is in order. Kwoka's critique of behavioral remedies adopted by antitrust authorities not only suggests that the reliance on the FTC will be ineffective, but it also suggests that the FTC itself will be particularly ineffective. Kwoka's analysis shows that the FTC is the "maven" of behavioral remedies in the antitrust space – over eight times less likely to oppose mergers and over twice as likely to rely on remedies. To the extent that Kwoka's findings are sound, they apply above all to the FTC.

Table 5.2 identifies a long list of reasons why the existing process will not work (most from Economides). Since the market cannot provide a "self-regulatory" solution to the problem, the regulatory regime must provide effective oversight to prevent abuse. The key is before the fact (*ex* ante) nondiscrimination on which entrepreneurs can rely. Without this strong assurance of nondiscrimination new entrants will be strangled and innovation at the edges without permission will be stifled.

The particular circumstances of the Internet and the unique value of innovation at the edges without permission magnifies the weakness of antitrust. While one might hope that antitrust practice would evolve away from the recent misguided view of markets and the abuse of market power, antitrust moves very slowly and the courts have established thresholds and burdens that favor inaction. The result is more support for legislation than one frequently sees from antitrust practitioners, as the only way to correct flaws that have been baked into the judicial process.

TABLE 5.2: REASONS WHY RELIANCE ON "SIMPLE" ANTITRUST AND TRANSPARENCY WILL NOT PROTECT CONSUMERS, COMPETITION OR INNOVATION

A. The "self-interest" in good behavior is weak where there is a lack of competition.
1. Firms profit from pricing/marketing abuse and controlling the flow of technology.
2. Survey evidence shows these have been the least popular companies in America for decades and it has not changed their behavior. If caught they move on to another abusive practice.
3. Dominant platforms and communications giants have a long history of saying one thing for political ends and doing another for economic ends.

B. Antitrust agencies struggle to address this type of abuse.
4. Structural remedies work much better for horizontal mergers than behavioral.
5. Vertical market power is particularly challenging.
6. Monitoring behavioral remedies is challenging for antitrust authorities, so transparency, simplicity for "third-party" oversight is necessary.
7. *Ex post* antitrust is ineffective to create the environment needed for innovation without permission at the edges.
8. Litigation is slow and case-specific. The communications network companies have been targets of legal challenges for decades and that has not changed their behavior.
9. Network effects are large and vulnerable.
10. Discrimination, with its threat of holdup and need for permission, can chill innovation at the edges without abuse.

C. Transparency won't work for complex bundles of products.
11. Behavioral economics demonstrates the ability to "manipulate" and "exploit" the consumer.
12. Lack of competition (choice) renders complaint useless.
13. Consumer monitoring costs and barriers are very high and responsibility is uncertain in a coproduced service.
14. The communications network companies have been among the worst for consumer satisfaction and that has not changed their behavior.

D. The FTC has repeatedly demonstrated it inability to deal with complex behavioral issues in the digital age.
15. The Microsoft case took half a decade and failed to produce a meaningful consent decree.
16. Facebook took the FTC a decade to enjoin their behavior and the solution may not be effective.
17. The FTC's record on privacy and Do Not Call is abysmal.

Source: Economides, xx

On similar occasions in the past, most notably in 1914 and 1950, Congress acted to correct the direction that the courts had taken by strengthening the antitrust laws. It is once again time for Congress to step in. In broad overview, Congress should update the antitrust laws to:

- Correct flawed judicial rules that reflect unsound economic theories or unsupported empirical claims

- Clarify that the antitrust laws protect against competitive harms from the loss of potential and nascent competition, especially harms to innovation
- Incorporate presumptions that better reflect the likelihood that certain practices harm competition
- Recognize that under some circumstances conduct that creates a risk of substantial harm should be unlawful even if the harm cannot be shown to be more likely than not
- Alter substantive legal standards and the allocation of pleading, production, and proof burdens to reduce barriers to demonstrating meritorious cases

Congress also should improve the effectiveness of antitrust enforcement by increasing the resources available to the federal antitrust enforcement agencies and increasing penalties. Even in these recommendations for legislation, the antitrust practitioners are cautious, preferring to rebalanced the process of litigation to promote more vigorous enforcement, but eschewing explicit prohibitions.[95]

REGULATION: ENDURING PRINCIPLES FOR A NEW BIG DATA PLATFORM OVERSIGHT AGENCY

The Big Data Platforms are the new chokepoint in the digital communications sector and they have immense power because they are the portal through which an immense amount of daily activity flows. Their ability to gather, analyze, use and abuse that data to undermine competition and override consumer choice is immense. The Stigler antitrust group has identified the specific economic challenges confronting both antitrust and regulation. The antitrust analysis offered a telling observation. "Data sharing, full protocol interoperability, non-discrimination requirements, unbundling. These are sources of rents that society may determine through appropriate regulation should not be part of the winner's reward."[96] There is no need to repeat that analysis here. However, the Shorenstein analysis adds broad principles to guide the regulatory response

Nondiscriminatory Access as a Common Law Duty to Deal

The concept of a common law that allows practice to evolve guided by core social principles has been one of the key pillars on which success in coping with the dynamic transformation of the economy stands. While some lament the flexibility that common law affords, that flexibility ensures the legal structure will not undermine economic development. The leading role of common law nations in the 2nd (Britain) and 3rd (America) industrial revolutions cannot be denied, although many factors may have been in play. Common law is explicitly the basis for the Sherman Act and has become (through quasi-judicial actions of regulatory agencies) the basis for much regulatory activity. Deference to expert agencies, where statues are "ambiguous," is essentially a common law approach.

Scholars at the Harvard Shorenstein center argue that the new digital regulatory agency should be based on two specific aspects of the common law, the duty to take care and the duty to deal. I have argued that the latter, in the form of an obligation to provide nondiscriminatory access to the means of communications and commerce, is part of the DNA of capitalism.[97] This obligation was clearly evident half a millennium ago in British law,[98] and early during the 2nd

industrial revolution in the U.S. (e.g. 1886),[99] played a key role in the development of the Internet,[100] so there should be little surprise that it has such importance at this turning point in the 3rd industrial revolution. Nondiscriminatory access to consumers through the chokepoint is the key to competition and consumer choice.

A good source of insight into the issue can be obtained by examining what the most important independent service provides, who needed access to the communications network to compete for customers, said was necessary (see Table 5.3). We explored this issue in a document that reviewed the official filing of an independent long-distance carrier and an independent Internet service provider at the key moment of debate after the passage of the 1996 Telecommunications Act. AT&T Long distance and America Online had not yet been acquired by dominant communications network owners, so they outlined the specific conditions they needed in order to compete.

Nondiscriminatory access to consumers is important for all three different types of competition.

- Head-to-head competition between platforms would have the greatest effect on the market, but it is the least likely. The large market share in a core service as the basis for ever expanding bundles is a major obstacle to competition.
- Unbundling becomes a key for freeing customers to switch suppliers. Access enables competition for complementary services.
- The hope is that a seller of complements will add enough customers to consider entering the access business. Competition in complements is a benefit, competition in access would be the big enchilada.

However, access is a complex concept. To support competition both the supply-side (reducing barriers to entry) and the demands-side (reducing switching costs) must be dramatically changed. Interconnection and interoperability are needed for a technical link. Unbundling and elimination of anticompetitive contracts are necessary to free customers, rigorous nondiscrimination including pricing and technical quality is necessary to make it possible for competitors top make an attractive offer.

PARTICIPATORY GOVERNANCE

The Shorenstein Center proposal also envisions a process of regulatory negotiation to improve outcomes. We called it participatory governance in an earlier piece.[101] It is quite consistent with Brandeis' support for industrial democracy in the early phase of the 2nd industrial revolution (WP#1). Whatever one thinks about how well the effort to implement industrial democracy worked or how far it advanced, the search for a new form of democratic participation is an important aspect of the technological revolution. The 3rd industrial revolution is no different.

There is every reason to believe that the pubic (consumers) can benefit from and contribute to improved regulation as much as industry (producers), just as end-user innovation has enhanced the performance of many areas.[102] Balancing the approach may also reduce

political tension. If regulatory approaches can be identified that are seen as effective but more flexible than traditional regulation, resistance may be reduced on both sides.

TABLE 5.3: NECESSARY COMPETITIVE CONDITIONS & NONDISCRIMINATION REMEDIES

Competition

1) local competition issues are resolved and the terms and conditions for local entry have been successfully implemented such that practical alternatives to the supply of local services exist in the local market;
2) a demonstration that vigorous and effective competition has evolved in a substantial portion of the market for broadband access services and in the market for BDU services:
3) the broadband tracking requirements have been implemented and reports from the telephone companies satisfy the Commission that treatment of broadband investment and expenses are appropriate;
4) price cap regulation has been implemented in such a manner as to preclude telephone companies from recouping broadband investment costs from utility services, the implementation of an effective price cap mechanism for basic and extended basic services in order to prevent instances of cross-subsidization;
5) the establishment of safeguards to ensure that broadband access services continue to remain available from the telephone companies on a non-discriminatory and unbundled basis.

Interconnection

(1) Comparably Efficient Interconnection: the principle of providing competitors with access to the broadband network on terms that are technically and economically equivalent to those provided by the broadcast carrier to itself.
(2) A prohibition on preferred agency or exclusive arrangements between vertically-integrated broadband access providers and integrated or affiliated information service providers which contain discriminatory access provision, either in terms of price or quality of access.
(3) Access: the ability to make a physical connection to cable company facilities, at any place where a cable company exchanges consumer data with any Internet service provider, or at any other technically feasible point selected by the requesting Internet service provider, so as to enable consumers to exchange data over such facilities with their chosen Internet service provider .

Pricing

- safeguards in order to prevent instances of anti-competitive behavior… implementation of a cost-based price floor to protect against below-cost pricing of broadband access services;
- implementation of a cost-based price ceiling with a limited mark-up to prevent excessive pricing of access services in uncontested markets;
- implementation of a third-party access tariff, allowing for non-discriminatory and unbundled access to broadband bottleneck facilities, as well as comparably efficient interconnection and associated non-price safeguards;
- implementation of price caps, accounting separations and other safeguards against anti-competitive cross-subsidization;
- imputation of appropriate third-party access tariffs to value added information services providers by broadcast carriers.

Non-price safeguards

- able to gain comparable access to network bottlenecks;
- protected against abuse of confidential information which is provided to the bottleneck access provider;
- not otherwise disadvantaged in the market by the bottleneck access provider through, for example, the negotiation of exclusive or preferential agreements with other service providers.

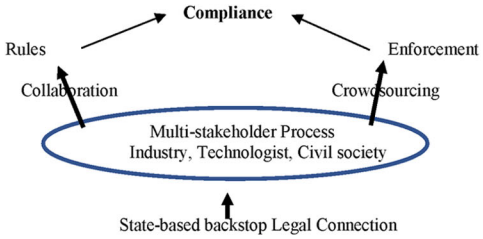
Bundling

- the bundled service must cover its cost, where the cost for the bundled service includes:
- the bottleneck component(s) "costed" at the tariffed rate(s) (including, as applicable, start-up cost recovery and contribution charges);
- competitors are able to offer their own bundled service through the use of stand- alone tariffed bottleneck components in combination with their own competitive elements;
- resale of the bundled service permitted…

Sources: AT&T Canada Long Distance Services, "Comments of AT&T Canada Long Distance Services Company," before the Canadian Radio-television and Telecommunications Commission, Telecom Public Notice CRTC 96-36: Regulation of Certain Telecommunications Service Offered by Broadcast Carriers, February 4, 1997. At the federal level, AOL's most explicit analysis of the need for open access can be found in "Comments of America Online, Inc.," In the Matter of Transfer of Control of FCC Licenses of MediaOne Group, Inc. to AT&T Corporation, Federal Communications Commission, CS Docket No. 99-251, August 23, 1999 (hereafter, AOL, FCC). America Online Inc., "Open Access Comments of America Online, Inc.," before the Department of Telecommunications and Information Services, San Francisco, October 27, 1999.

As described in Figure 5.2 consistent with the Shorenstein proposal, participatory governance is envisioned as a multi-stakeholder process that involves industry, civil society and technologists in both the writing and enforcement of rules. The ultimate goal is to foster compliance, rather than enforcement.

FIGURE 5.2: THE STRUCTURE OF PARTICIPATORY GOVERNANCE



ATTRIBUTES OF AN EFFECTIVE ALTERNATIVE REGULATION STRUCTURE

Transparency/Openness
- Clarity of Purpose
  - Dialogue
  - Consensus
  - Informing policy process
  - Influencing decisions
  - Planning
  - Implementation
  - Monitoring and evaluation
  - Data gathering and analysis
- Clarity of Process/Rules
  - Governance
    - Convening
    - Decision rules
      - Voting
        - Unanimity (Veto)
        - Super Majority
        - Majority
      - Non-Voting Rough Consensus
      - Right of Appeal, Dissent
- Scope of "Authority"
  - Rules only
  - Review of operations & goals

Enforcement – Compliance
- Accountability
- Fairness
- Speed
- Appropriateness
- Complaint and Audit
- Adequacy of Resources

Participation
- Public Awareness
  - Rights - Redress
  - Public consultation
- Inclusiveness
  - Access
  - Representativeness
  - Organization of groups
  - Resources
  - Expertise
  - Role of independents
- Adequacy of Resources
  - Overall
  - For NGOs
- Industry Coverage
  - Achieve Critical Mass
  - Avoid "Capture" & Ballot packing

Legal Clarity
Relationship to gov't.
- Formal
  - Sponsored
  - Recognized
  - Status of Decisions
    - Safe Harbor
    - Reg.-Neg.
    - Sponsored
    - Recognized
    - Preferred
    - Advisory
- Informal
  - Bully Pulpit- Nudge
  - Procurement
  - R&D
- International

Desired Results
- External
  - Credibility
  - Legitimacy
  - Effectiveness
  - Efficiency
  - Adaptability
  - Flexibility
- Internal
  - Building Trust
  - Shared Knowledge & Expertise
  - Culture of Cooperation & Leadership

Sources: Mark Cooper, "The Quarter-life Crisis Based on:
Hans Bredow Institute, Final Report: Study on Co-Regulation Measures in the Media Sector, University of Hamburg, June 2006http://ec.europa.eu/avpolicy/docs/library/studies/coregul/final_rep_en.pdf, at 118-123,

Bert-Japp Koops, et al., Starting Point for ICT Regulation, B-J Koops, et. al (Eds.), Starting Points for ICT Regulation, ITER, The Hague, 2006http://rechten.uvt.nl/prints/upload/20066279 0842312037944.pdf, at 133-140.

Bart Cammaerts, "Civil Society participation in multistakeholder processes: in between realism and utopia, *LSE Research Online,* 2009

Source: Mark Cooper, xx

The participants are the three sets of non-governmental interests. The activities are rule writing and enforcement. Participatory governance is supported by the state in the delegation decision. Although it is an attractive approach to increasing participation and achieving wider support for regulation and good behavior, there are many factors that determine how successful it will be. The key factors are shown in the table below the graph in Figure 5.2. Multi-stakeholder processes have worked in key areas of the Internet, but there were unique conditions that made this success possible.[103]

Moreover, since guardrails and guidance must be "imposed" by regulation, the state must be closely involved in establishing and monitoring the process. Ultimately, if the participatory process produces a consensus rule, that rule can be given great weight in a regulatory process that adopts it as policy. But there must be a regulatory process to ensure that the rule is binding (i.e. participatory governance is not voluntary self-regulation). With strict timelines, adoption and enforcement from the sponsoring agency, this could become the main approach to rule-making.

6. "DOS AND DON'TS:" BUILDING GUARDRAILS AND GUIDANCE FOR DIGITAL COMMUNICATIONS

"DO" RECOGNIZE THE IMPORTANCE OF DUAL JURISDICTION

The commitment to competition and consumer protection created a strong commitment to dual jurisdiction. Economic regulation and antitrust were focal points of pragmatic, progressive capitalist policy activity in the late 19th century as large corporate entities, above all the railroads, became more important and ultimately dominant in the economy. Dual jurisdiction was applied very early in the development of telecommunications, as shown in Table 6.1. The telecommunications sector is a useful example here because it is a critical part of the communications sector and a strong complement for big data platforms.

TABLE 6.1: THE LONG HISTORY OF DUAL OVERSIGHT IN THE COMMUNICATIONS SECTOR

Year	Regulation	Antitrust
1887	Interstate Commerce Act	
1890		Sherman Act
1910	Mann-Elkins Act	
1913		ATT/DOJ Consent Decree
1914		FTC Act
1927	Radio Act	
1934	FCC Act	
1945		Associated Press
1949		Final Judgment
1956		Modification of Final Judgment
1968	Carter Phone and Computer Inquiries	
1969	Red Lion	
1984	Spread spectrum decision leading to Cable deregulation	Break-up of ATT
1987		Triennial reviews begin in the Antitrust court
1992	Cable Reregulation (Consumer Protection Act)	
1996	Telecom Act of 1996	
2003	Cable Modem Order	
2005	Madison River	
2005	Wireline Broadband Order	
2010	Open Internet Neutrality Order	Ticket Master
	Comcast/NBC Merger Conditions	Comcast-NBC Consent Decree
2011	ATT/T-Mobile merger blocked	
2013	Data Roaming Order	e-Book Price Fixing
2014	Open Internet Order remanded	
	Universal Service Reform Upheld	
2015	Title II jurisdiction over Broadband Under the Communications Act of 1934	
2017	Administrative Repeal of the '34 Act	

Source: Mark Cooper,

In a sense, the communications networks were the chokepoints that policy successfully opened to create the environment that allowed the Internet to flourish. The big data platforms have become the new chokepoint in the digital communications sector.

This jurisdictions frequently interact. Antitrust driven developments are later incorporated into economic regulation. The failure of regulation to prevent abuse can give rise to antitrust action. Congress can give greater authority to either antitrust or regulatory development through legislation, which tends to occur after practice has stabilized. In merger review, the FCC has a broader charge than antitrust. The very concept of the public interest was despised by free market fundamentalists, like Michael Powell, the first chairman of the FCC under George W. Bush,[104] but the flexibility of the concept has proven durable. It is not an exaggeration to say that the success of the modern communications sector rested on this dual oversight of the industry, which strove to keep it as competitive as possible and pressed it toward progressive goals, given the available technologies. This important role of balanced, dual oversight continued into the digital era, until the FCC sought to administratively repeal the Communications Act and the antitrust authorities continued lax oversight.

"DON'T" RELY THE FEDERAL TRADE COMMISSION

In WP#2 we explained why the Federal Trade Commission is the wrong agency to rely on for oversight over the immense market power of Big Broadband Networks. In this paper we have shown that the same conclusion applies to Big Data Platforms. The failure in privacy is particularly telling in this regard, since the use and abuse of data is central to the market power of the Big Data Platforms. Table 6.2 repeats the market failures in the privacy space and the failure of the FTC to address the problem. The FTC had not seen fit to regulate any of it although it had been looking at the issue for over a decade.

Behavioral targeting may be particularly harmful to vulnerable populations, including youth and the elderly. Although the survey data showed that few consumers of any age comprehend the trade-offs involved with behavioral targeting, youth and the elderly are at special risk of not understanding the consequences of being tracked online. The Federal Trade Commission's (FTC) Self-Regulatory Principles for Online Behavioral Advertising and voluntary industry self-regulatory programs have proven inadequate to ensure that consumers have effective control if they do not want their online behavior to be tracked for purposes beyond fulfilling the transactions they make.

The Stigler antitrust group claims a single focal point on competition and repeatedly notes that there are other groups working on "non-economic" issues like privacy. However, in reviewing the recommendation about how to restore and ensure competition in the big data platforms, it is clear that a major component of that effort involves the collection, use, and abuse of data on individuals and groups. A simple observation reconciles the two different aspects of the analysis. Without a vigorous and effective set of institutions to protect privacy, the performance of the big tech platforms will continue to disappoint. Privacy advocates would go farther in limiting data flows.

Data portability, which is a classic antitrust policy solution to restore the potential for competition, embodies the tension between privacy concerns and competition. Data should be portable, but without an effective set of institutions to constrain producer collection and use of data, not to mention consumer control (sovereignty) over that data, there is no reason to believe data portability will improve the competitive situation. Without those institutions in place, data portability will make the negative impact on privacy worse.

TABLE 6.2: MARKET IMPERFECTIONS LEADING TO THE FAILURE OF PRIVACY PROTECTION IN CYBERSPACE

Societal: Situations where important values are not well reflected in market transactions

Externalities: Trust is undermined[1]

Non-economic Values: Concern,[2] Fear of Being Monitored,[3] and Exposed,[4] Reputational Harm,[5]

Unwanted Intrusion,[6] Physical Security,[7]

Structural: Conditions that result in inefficient outcomes

Insufficient Competition: Incomprehensible Privacy Policies,[8] Inadequate Choice[9]

Economic Harm: Bad Purchase Decisions,[10] Security Breaches,[11] Identity theft [12]

Endemic: Tendencies of economic relations that undermine key market functions

Perverse Incentives: Incomprehensible Privacy Policies,[13] Slow to React[14]

Asymmetric Information: Speed of Technological Change[15] v. Slowness to React,[16] Difficulty of Detecting Harm,[17] Invisibility of Transactions and 3rd Party Relations[18]

Transaction costs: Frictions that impose costs and constrain exchange

Search and Information Costs: Lack of Simple and Clear Information,[19] Cost of Interrupting Transactions to Find, Evaluate and Act to Protect Privacy,[20] Invisibility of Transactions and 3rd party Relations to Consumers[21]

Bargaining Costs: Lack of Alternatives,[22] Inability to Define[23]

Policing and Enforcement Costs: Difficulty of Detecting Harm,[24] Complexity, Level and Amount of Information Gathered,[25] Rapid Pace of Technological Change,[26] Third Party Relationships[27]

Behavioral: Psychological and other human traits that bound "maximizing" actions

Motivation: Concerns,[28] Fear of Being Monitored[29]

Perception: Reputational Harm [30]

Calculation: Failure to Understand,[31] Failure to Appreciate Risk,[32] Lack of Awareness[33]

Execution: Struggle to Keep Pace,[34] Do Not Read[35]

Sources and Notes: U.S. Department of Commerce, *Commercial Data and Innovation in the Internet Economy: A Dynamic Policy Framework,* December 2010; Federal Trade Commission, *Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers,* December 2010.

1. DOC, pp. vi, 1, 13, 15.
2. FTC, pp. iii, 28-30, DOC, pp. 3, 16-17.
3. FTC, p. iii.
4. FTC, p. 20.
5. FTC, p. iii.
6. FTC, p. iii.
7. FTC, p. iii.
8. FTC, pp. iii, 26.
9. FTC, p. 19.
10. DOC, p.1.
11. DOC, p. iii.
12. DOC, p. 1,
13. FTC, pp. iii, 26.
14. FTC, p. iii, DOC, p. 1.
15. FTC, p. 36.
16. FTC, p. iii.
17. FTC, p. 33.
18. FTC, pp. I, iii, 26.
19. DOC, p. vii
20. FTC, p. 27
21. FTC, pp. iii, 26.
22. FTC, p. iii.
23. FTC, p. iv, 35,
24. FTC, p. 33.
25. FTC, pp. ii, DOC, p. 18-19.
26. FTC, pp. ii, iii.
27. FTC, pp. ii, DOC, p. 16.
28. FTC, pp. iii, 28-30, DOC, pp. 3, 16-
29. FTC, p. iii.
30. FTC, p. iii.
31. FTC, p. ii, 26, DOC p. 4.
32. FTC, p. ii.
33. FTC, p. ii.
4. FTC, pp. ii, 26.
35. FTC, p. iii.

> We call for federal baseline legislation that ensures a basic level of protection of all individuals in the United States… While the Federal Trade Commission (FTC) helps to safeguard consumers promote competition, it not a data protection agency. The FTC lacks rulemaking authority. The agency has failed to enforce the orders it has established. The U.S. needs a federal agency focused on privacy

> focused on privacy protection, compliance with data protections obligations, and emerging privacy challenges. The agency should also examine social, ethical, and economic impacts of high-risk data processing and oversee impact-assessment obligations.[105]

"DO" BUILD SYSTEMS THAT AFFORD EXPERTS THE FLEXIBILITY TO RECOGNIZE AND BALANCE THE COMPLEXITY OF BENEFITS AND COSTS

Figure 6.1 defines these issues in the privacy space, which has been under review for two decades. On the x-axis is the ability of consumers to defend themselves from the abusive collection and use of data. On the y-axis is the sensitivity of information.

Beginning on the x-axis, certain groups were historically seen as unable to defend themselves, like children, youth, and the elderly. Recent events suggest that average citizens have been unable to defend themselves from government surveil*lance. We show these are red areas where prohibitions have been (or need to be) strong.

On the y-axis, there are types of information that have traditionally been deemed so sensitive as to require special rules – healthcare and financial information, for example. These rules may have to be updated. Again, we show these are red areas where protections or prohibitions must be strong.

The much larger task is to develop rules to deal with other types of information. People should be allowed to choose how information is collected and used, but the mechanisms for choice must be highly developed and effective. For the vast majority of consumers that is not true of the current institutions. It remains to be seen whether it is possible to develop these institutions. The graph identifies real transparency on the supply-side – with the shorthand of Fair Information Practices (FIPS) are not enough. The demand side requires mechanisms for effective consumer action. Both FIPS and effective choice mechanism must be ongoing, with consumers empowered to decide before information is gathered and to easily change their choice as they see fit.

The graph shows a tentative safe harbor for information that is transaction specific (used only to complete a transaction and for no other purpose). It would be convenient if this space was easy to define, as it was in the physical age, but in the digital age it is not. It is a space that is needed, but will be contested.

The two principles embodied in this approach are general. First we have the principle of setting strict bans in some dimensions because it recognizes the impossibility of effectively policing the harmful behaviors that are highly likely to develop under the market's perverse incentives. Second, we have the establishment of rules to define practices that may be beneficial, as long as they are not abused in an anticompetitive or anti-consumer manner.

FIGURE 6.1: CONSUMER/PRIVACY ADVOCATE ISSUES FOR A DATA PROTECTION AGENCY

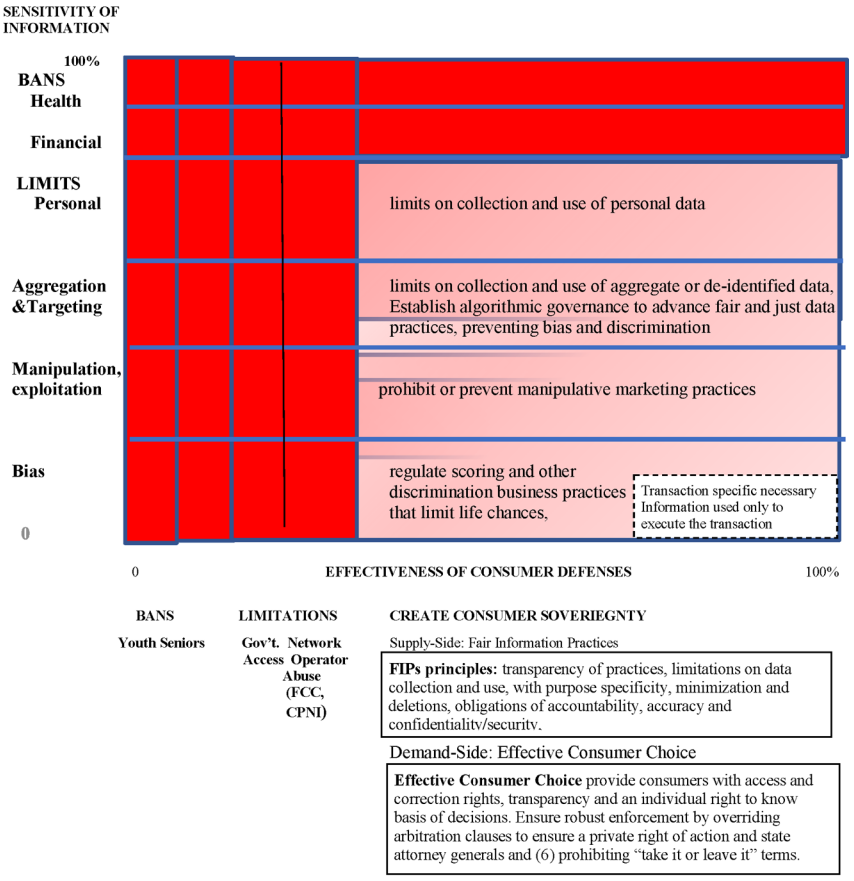
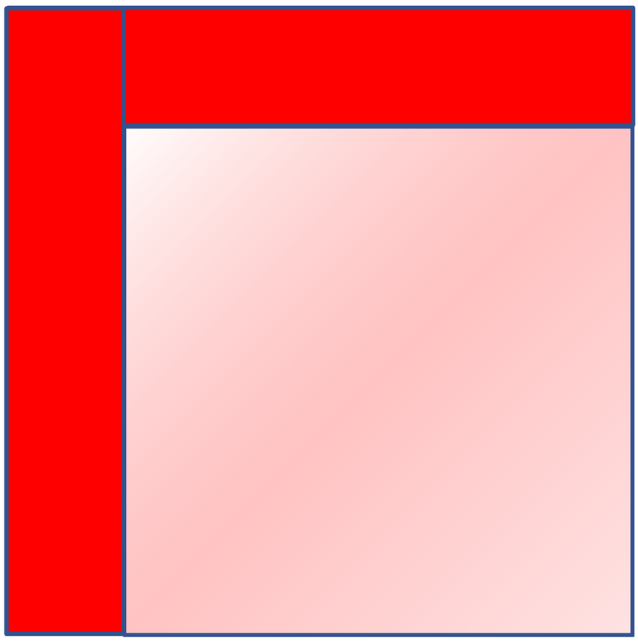


Figure 6.2 general the privacy approach to the broader goals of promoting competition and protecting consumers. We use two axes drawn from the Structure-Conduct-Performance paradigm. On the X-axis is conduct by consumers and producers that facilitates the abuse of market power. On the Y-axis are basic conditions and market structures that are conducive to the abuse of market power. The goal is to establish policies that limit restrict the tendency toward abuse. There are red zones, where simple bans may be needed and then a large area where rules are adopted that require specific behaviors. We have not filled these in because the

goals, where to draw the lines and what the content of the specific rules should be will vary from sector to sector.

FIGURE 6.2: A BROAD APPROACH TO CHOOSING "BANS" VERSUS "REGULATION" FOR GUARDRAILS AND GUIDANCE TO DIRECT MARKET BEHAVIOR

Market Structure/
Basic Conditions
Including
New digital &
Lax traditionnel



Conduct that facilitates abuse of market power in the digital communications sector
Including consumer and producer behaviors

It uses two axes drawn from the Structure-Conduct-Performance paradigm. On the X-axis is conduct by consumers and producers that facilitates the abuse of market power. On the Y-axis are basic conditions and market structures that are conducive to the abuse of market power. The goal is to establish policies that limit the tendency toward abuse. There are red zones, where simple bans may be needed and then a large area where rules are adopted that require specific behaviors. We have not filled these in because the goals, where to draw the lines and what the content of the specific rules should be will vary from sector to sector.

The working papers provide three examples in the communications sector, although the broader discussion of pragmatic progressive capitalism (WP#1) demonstrates that this flexible

approach was applied to mean important economic sectors (e.g. finance, labor) and social issues (educations, environment).

In addition to the privacy/data example discussed above, WP#2 dealt with the case of network neutrality, which argued for a light-handed Title II approach to nondiscriminatory access, as an evolution of "common carrier" obligations, which were themselves a pragmatic response to the challenge that the 2nd industrial revolution to a long-standing commitment to nondiscrimination.

The response to the failure of competition to control the abuse of market power at the Business Data Services chokepoint in the digital communications sector is more traditional common carrier, with specific anticompetitive practices banned and an ongoing effort to establish a formula for just and reasonable rates.[106]

We view these as examples of a pragmatic approach that is not "outdated," as they are frequently dysphemized, but "updated" applications of enduring principles. Congress has, correctly, been hesitant to draw the hard lines and, certainly in the case of the communications regulator, it has allowed a great deal of flexibility. As a result, practice has evolved along a common-law-like path that reflects the technologies being used. Size limitations, structural separations, banning specific practices, and the extent of regulation, are all important policy questions that have gained currency and can be addressed in legislation by giving them weight and prominence as rulemaking considerations, without drawing lines and making them mandatory.

For example, traffic blocking, slowing and paid prioritization are seen as anticompetitive practices that are widely criticized. Free market fundamentalist believe they can be controlled by statements of principles backed up by self-regulation, transparency and weak oversight by the FTC. History suggests this will not be effective and it will not achieve the same effect as an explicit rule that bans the practices. Similarly, antitrust had specific thresholds for concern about market power abuse in highly concentrated markets, (30% for the abuse of buyer market power (monopsony, 65% for seller market power, the equivalent of 4 to 6 firms in all markets, concerns about vertical integration). The problem was not in the thresholds or identification of issues, it was in the failure of antitrust authorities to enforce these thresholds or the courts to embrace them.

The solution is for Congress to make clearer statements of goals. In the past most agency portfolios did not include promoting competition and innovation, which should be added to the more common goals for consumer protection and universal service. Specific findings about what contributes to or frustrates the achievement of those goals in legislation could constrain agency discretion. Bans on specific practices and hard thresholds may be necessary, but ultimately agency expertise, based on analysis of real-world performance, should be allowed to operate and arrive at these conclusions.

"DON'T" THINK SIMPLISTIC EXTREMES ARE THE SOLUTION; UTILITY-LIKE REGULATION AND ATOMISTIC COMPETITION SHOULD BE OPTIONS FOR EXPERTS, NOT MANDATES

A stiff dose of reinvigorated competition is certainly needed, as is regulatory oversight that reflects fundamental economic, social, and political values. The following brief discussion focuses on economics as derived from the Brandeis- Stiglitz analysis developed herein. However, as analysts and advocates have rushed to take progressive positions within the contemporary policy debate with very broad recommendations, it is important to show why a complex, balanced position seems superior at a general level. The question is: how should stricter antitrust and new regulation be imposed?

In the position of central planners, we find a call for utility-like regulation of all big digital firms. This view has an overly optimistic evaluation of utility regulation and little regard for efficiency given the nature of the technology to be regulated. We can make this case with observations from both history and contemporary policy. Brandeis, Stiglitz, and the New Deal had several distinct regulatory models for different sectors depending on the nature of the function performed by the sector. Here, I offer six observations that connect with the debate over utility-like regulation.

First, in addition to the utility model, which was actually quite limited, there was a model for the financial sector and other sectors that was less "regulatory" than utility-like regulation. In addition to finance, this was applied to public safety, labor, and other sectors.

Second, interestingly, when the Obama administration decided that it needed the authority under the Communications Act of 1934 to ensure basic values in the age of digital transmission over communications networks, the administration invoked Title II, where utility-like regulation resides. However, it eschewed more than four-fifths of the sections of that title, including the most classical utility regulation – rate setting, tariffing, and pre-approval of offerings. In other words, given the battle over network neutrality, it sought to make the smallest claim to authority possible. Better statements of goals and the weighting of factors to be considered might help to ensure a better outcome and limit the agency's discretion to achieve outcomes that are inconsistent with the law, contemporary economic understanding of the market, and the facts before the agency.

Third, over the course of eight years, the FCC, sustained by the courts, developed and implemented a hybrid model that was very much oriented toward competition and market flexibility (such as wireless interconnect, i.e., roaming, universal service). The goal was to establish a strong principle of nondiscrimination while preserving the flexibility to innovate (i.e., without pre-approval or tariffing of service). This complex approach is more challenging, but the benefits of preserving flexibility and innovation are worth the trouble.

Fourth, historically, the biggest failures of regulation have involved rigidities of utility-like regulation that should have been avoided. Although these are rare, they are real and they are the mistakes to which market fundamentalists point in their attacks on regulation. The call for utility-like regulation invites this market fundamentalist subterfuge unless one explains how these big mistakes will be avoided.

Fifth, utility-like regulation in communications (Title II standards) are imprecise even after three-quarters of a century of regulatory practice and case law. Congress pragmatically used loose language to deal with challenges in the regulation of a dynamic sector like

telecommunications. The underlying technology has always been more dynamic than the law, and this has become overwhelmingly apparent in the digital era. Drawing bright lines before the fact will provide greater certainty once the rule-making and litigation are done, but therein lies the rub. Bright lines can easily undermine innovation, and the Stiglitz critique of, even well-intentioned market socialist administrators deserves careful consideration.

Finally, the general approach to utility-common carrier regulation is challenging from the point of view of the Internet innovation system. The Brandeis-Stiglitz emphasis on oversight to make markets work better has special force in the digital space. Utility regulation is about homogeneity and stability. It thrives in static environments and, inevitably, reinforces the stasis of the environment because it operates best by creating silos with categories of producers and consumers, definitions of acceptable behavior, and permissions required to act. These service categories and "does & don'ts" are hashed out in administrative proceedings and court cases that can stretch out for years or even decades. The cost of delay can be ignored because the sector is so static.

Digital communications networks are the antithesis of common carrier telecommunications networks. They thrive on diversity and prosper with dynamic change. The essence of utility regulation is antithetical to the experimentation, innovation, and entrepreneurship that have been the hallmark of the digital economy. In a dynamic environment, the costs of delay and the value of lost services – innovation that is never brought to market – are high. Greenstein's description of how experimentation works makes this point clear, "because nothing precluded this unanticipated use from growing, grow it did." In the utility-common carrier approach, everything is precluded until it is permitted, and problems immediately end up at the Commission for adjudication. "Brutally simple" bright lines that opened the way to entrepreneurial behavior worked in the past, unlike detailed regulation of behavior.

At the other extreme are those who argue that atomistic competition enforced by reconceived and aggressive antitrust is needed. This would break up everything with little regard for efficiency, under the presumption that efficiency is the culprit for many recent abuses. Historically, market fundamentalists argued the opposite of the neo-Brandeisian atomistic antitrusters (i.e., that the presumption should be in favor of size, not against it).

The analysis of antitrust in the New Deal raises several important points.

First, while Brandeis might have been more comfortable with atomistic antitrusters' position, he was unwilling to abandon efficiency.

Second, Thurman Arnold argued lax enforcement should not be used as an excuse for abandoning the fundamental approach to antitrust. The general consensus is that he accomplished his goal. The pragmatic compromise he advocated proved to be effective until it was explicitly abandoned.

Third, FDR's claim that the Supreme Court had shackled him with a "horse and buggy" economy was too extreme. Here, too, the pragmatic compromise proved to be effective until it was explicitly abandoned. The later New Deal that Brandeis supported provides several examples in specific sectors.

Fourth, bans should be restricted to things that simply cannot be regulated well. In finance the New Deal relied on regulation, but also chose to ban the comingling of banking and investment (Glass-Steagall) because the resulting conflicts of interest and perverse incentives were too strong to regulate. The Public Utility Holding Act banned interstate utilities unless the utility could prove efficiency gains from direct interstate connection through the grid. For over half a century these laws did their job remarkably well, and every time a hole was poked in them, bad things happened, to say the least (e.g., the financial meltdown, PURPA).

Fifth, with a great deal of ambiguity in the New Deal and flexibility in its implementation, the FCC seems to have done a good job of promoting progress and universal service. It was only after the breakup of AT&T, the effort to make subsidies explicit, and, ultimately, the ill-considered decision to deregulate prematurely that neoliberal ideology was able to undermine the public interest.

THE STIGLER RECOMMENDATIONS

Having dissected the Stigler analysis, it would be a significant oversight if the analysis did not note the very strong agreement with the analysis in this conclusion. With one important exception, the introduction to the Stigler report is similar to the analysis in this paper.

It begins with a summary of key findings on the structure and conduct of big data platforms, emphasizing that consumers pay for the pieces of the bundle that may appear to have a zero price. They pay indirectly in cash and in kind. Moe importantly, they lose a great deal from the reduced competition that bundling, data exploitation and increased switching costs cause. All of the negative effects of market power (resulting from higher concentration and more vertical integration) are identified in the Stigler introduction: higher (though indirect) cost, lower quality, less innovation. There is no chance that the market will self-correct due to the structural conditions in the sector and the powerful incentives that platforms have to defend, increase and exploit their market power. The economic problem becomes a much larger social problem because of externalities, like loss of privacy, reduced production of news and distortion of political discourse. "This concentration of economic, media, data, and political power is potentially dangerous for our democracies."[107]

The recommendations offered include interoperability, aggressive antitrust, transparency, and an independent regulator, designed to avoid capture. There is a sensitivity to the unique conditions that may "normally" be benign market behaviors but become anticompetitive and ante-consumer in the hand of dominant, big data platforms.

> Exclusive dealings and loyalty discounts, which are common in most markets, deserve much closer antitrust scrutiny in DP [digital platform] markets because these markets have a natural tendency to monopolization: Many practices that are benign in other markets could easily become the straw that breaks the camel's back in DP markets.[108]

We are not convinced that exclusive dealing, whether or not it is common, is very benign. It has been given an undeserved "free pass" by free market fundamentalism. We do agree that they are a particular concern in the presence of big data platforms.

On the other hand, the proposal aims to encourage experimentation and maintain the ability of the states to try other approaches. These are two characteristics that were central to the Brandeis Protocol. Careful, timely analysis of real-world data is the cornerstone of many aspects of the effort to prevent abuse.

The proposed remedy also includes a novel approach to make the rule more responsive to consumer needs. This process begins to look a lot like the participatory governance described above. The intense study it advocates should certainly be part of the participatory governance process.

> The adoption of "consumertarian default rules"; that is, default rules on data protection that follow the preferences of a majority of US consumers. Such defaults should be based on "the results of well-designed, scientifically rigorous studies that elicit consumer preferences, opt-out costs, and knowledge of the rules and alternatives, as well as ignorance and biases of such rules' potential costs and benefits." These default rules should also be revisited periodically to account for updates in consumers' preferences due to technological changes or better education.[109]

The proposal involves a great deal of differentiation. There are different levels of protection for different types of data, different approaches to writing rules, and different paths for firms to come in compliance with rules.

> An interesting alternative may be for some authorities to establish a safe harbor for companies that pre-commit in advance to the result of product-specific studies, which must be periodically rerun. If a company fails to qualify for the safe harbor, it is exposed to additional legal liability in litigation if a plaintiff can prove that the default fails the "consumertarian" standard. Finally, federal regulation should be a floor—states should be free to establish different, more protective requirements as they deem appropriate.[110]

Finally, "if all else fails" the authors argue that society should consider "the imposition of an additional fiduciary duty on the boards of monopolies: a fiduciary duty towards society." This is essentially the common new law duty to take care.[111]

All of these measures are pragmatic and progressive, intended to make competition, markets and capitalism work better. The one area where we disagree strongly is the suggestion that the FTC can take on much of this regulatory oversight. The institutional nature and past behavior of the FTC discussed above indicates strongly that it is not up to the job. We need a new regulatory agency designed to deal with big data platforms.

OTHER VIEWS OF THE CHALLENGES AND RESPONSES TO BIG DATA PLATFORMS SEEN THROUGH THE BRANDEIS PROTOCOL FOR PRAGMATIC PROGRESSIVE CAPITALISM

The discussion above relies heavily on an analysis prepared by a broad range of American analysts examining the challenge of the transformation brought on by digital technology. In each of the working papers we have made reference to broader (particularly European) points of view. Table 6.3 summarizes three such studies in by locating these research

efforts in the broader, Brandeis Protocol. With about two-third of the element of the Brandeis Protocol for pragmatic progressive capitalism discussed in Working Paper #1, it shows that the analysis could have launched from any one of a number of similar studies.

TABLE 6.3: BIG TECH POLICY PROPOSAL VIEWED THROUGH THE BRANDEIS PROTOCOL

	Economic Fundamentals	A	B	C		**Political Fundamentals**	A	B	C
	Capital					**Democracy**			
1	Capital/Free markets	*	*	*	49	Democracy & competition	*	*	*
2	Fairness & equal opportunity	*	*	*	50	Civil Rights (Gender)	*	*	
3	Industrialization>Globalization	*	*	*	51	Education	*		
4	Inequality	*	*	*	52	Participation	*	*	*
5	Efficiency	*	*	*	53	Responsibility of Citizens	*	*	*
6	minimum scale, diseconomies		*	*	54	Unaccountable power	*	*	*
7	Competition	*	*	*	55	Speech	*		*
8	Yardstick competition		*		56	Privacy	*	*	*
9	Innovation	*	*	*	57	Law	*	*	*
10	Concentration/Trustbusting	*	*	*	58	the public interest, pub. Private Law	*	*	*
11	Vertical Integration	*	*	*	59	Lagging Law (common)		*	*
12	Collusion				60	due process	*	*	*
13	Unaccountable Power	*	*	*	61	Lawyers (Professionals)			
14	Intermediation (Big Banks)	*	*		62	Obligations of a Professions	*	*	
15	XS Financialization		*		64	Failure in Capture	*		
16	Conflict of Interest		*	*	66	Social Science	*	*	*
17	Denial of Access to Capital		*	*	68	Lagging Law	*		*
18	Access to information		*	*	69	Pragmatic Process	*	*	
19	Anticompetitive impacts:	*	*	*	70	Law & Reality	*	*	*
20	Excessive pay, fees charges	*			71	Facts (Brandeis Brief)		*	
21	Price, service	*	*	*	72	Flexibility (evolutionary)		*	
	Labor				73	Experimentation/Federalism	*		
28	Labor				74	Restraint & Responsibility		*	*
31	Unrest		*			**Regulated Competition**			
32	Unions				77	Institution building	*	*	*
40	Cooperation		*		78	Antitrust	*	*	*
45	Scientific Management	x	x	x	79	Sherman Act		*	
46	Cost Savings	x	x	x	80	new agencies (FTC)	*	*	
47	Social challenges	x			81	Regulation	*	*	*
48	Surplus	x	x		82	Authority, power & tools	*	*	*
					83	Uniqueness of war		*	
					84	Police power		*	
					87	Interstate Commerce		*	
					88	Economic	*		
					89	New & Expanding (Fed. Reserve, ICC)	*	*	*
					95	Health, safety	*	*	*
					96	Investor Protection		*	*
					97	Public Provision	*		

Sources A: *Stigler Center Committee on Digital Platforms,* September 2019., B: Shorenstein Center (Harvard) (Kimmelman, Wheeler, Verveer), C: UK Competition Authority, *Online Platforms and Digital Advertising Interim Report,* 2019.

Some of the recommendations are focused on a subset of issues, while others are more broadly framed. Nevertheless, the two U.S. sources reviewed cover almost 60% of the elements. The elements not covered are either clustered in the labor category or belong to two other categories that cannot addressed by policies that seek to address market power and its impact – "isms" and public provisions. Thus, the three sources cover over three-quarters of the elements their targeted areas of analysis and policy recommendations. This suggests that their broad examination has created a strong framework for the further analysis of specific sectors in future papers in this series.

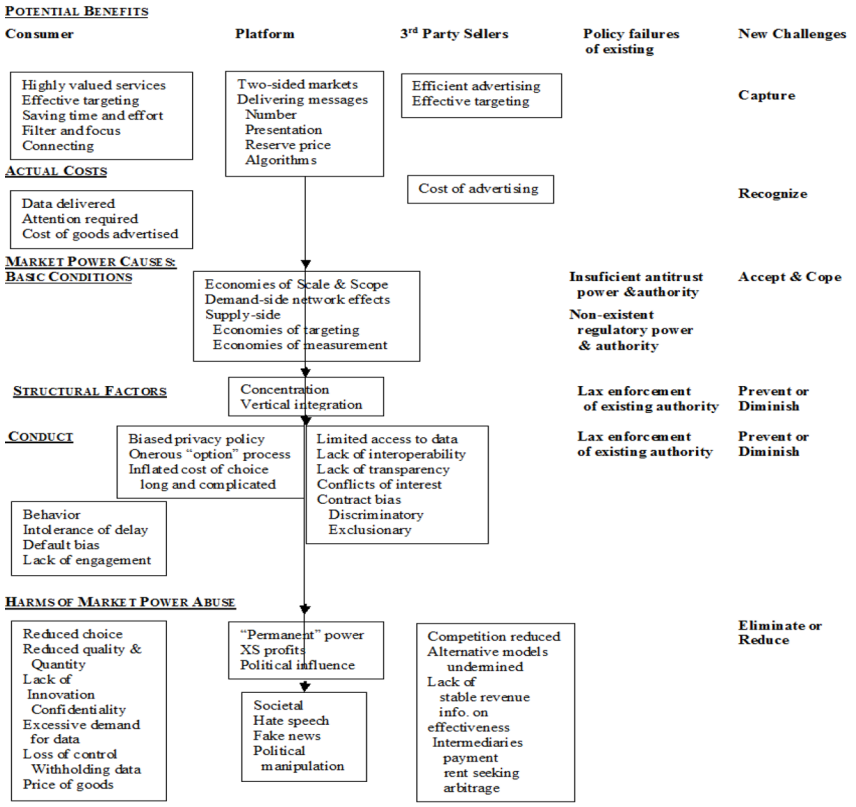
Figure 6.3 makes the point that these observations are shared widely. It offers a view of the lengthy analysis by The Competition and Market Authority (CMA) in the UK. It has provided a convincing analysis concluding that, while antitrust is part of the solution, it is far from sufficient. The CMA analysis presents, what I believe is a detailed, micro-level structure-conduct-performance framework. The left-hand column of the figure reflects the four main elements of the SCP framework – basic conditions, structure, conduct and performance.

The next four columns bring the analysis down to the factors that operate in the digital communications sector. The characteristics of platforms and their impact on third-party sellers are identified. Then the failures of current oversight are noted, followed by the goals of how new policy should deal with the challenges. The key point is that there are benefits, costs, and basic conditions that operate in the digital communications sector, which must be accepted and recognized if policy is to ensure that the benefits are captured. The basic conditions in this sector pose a severe challenge to competition and markets. There are, however, a host of structure and conduct factors that have made things much worse (i.e., led to extensive abuse). These can be prevented or diminished to reduce or eliminate of the abuses.

CONCLUSION

Once we recognize that economies of scale and scope on the supply and demand side of the market create efficiencies, we must accept the proposition that there will be small numbers of firms supplying the functionalities that consumers want because their cost/price will be lower. This is an infrastructure problem that has existed, at least since the birth of capitalism. The answer has always been to design a structure that provides the shared infrastructure and makes it available to all users on fair reasonable and nondiscriminatory rates, terms and conditions (FRAND). There have been a variety of solutions, from regulated, private, franchise provision (common carriers, turnpike trusts) to state ownership. Unregulated private provision has been a disaster for well over a century because the economic interests of the private actors are in conflict with the public good. The question is not to whether to regulate the behavior, but how.

FIGURE 6.3: UK COMPETITION AND MARKETS ADMINISTRATION VIEWED THROUGH THE STRUCTURE, CONDUCT AND PERFORMANCE PARADIGM



Source: United Kingdom, Competition and Markets Authority: *Online Platforms and Digital Advertising: Interim Report*, 2019.

ENDNOTES

[1] *Washington Post*, Editorial, July 30.
[2] Id.
[3] Antitrust Experts, 2020.
[4] The primary study on which we rely is a major undertaking by the Stigler Center, 2020. Additional studies include, The Shorenstein Center, 2020a, 2020b; and the UK Competition Markets Authority.
[5] Antitrust Experts, 2002, We are concerned that market power is on the rise in the U.S. economy generally, including in the digital markets that are the Committee's focus. Growing market power harms consumers and workers, slows innovation, and limits productivity growth. Courts have contributed to increased monopoly power through decisions that have weakened the prohibitions against anticompetitive exclusionary conduct and anticompetitive mergers. The circumscribed state of the law and insufficient resources have resulted in insufficiently aggressive government enforcement. And when enforcers do bring meritorious cases, their success has been hampered by serious deficiencies in the contemporary judicial interpretation of the antitrust statutes.
[6] Antitrust Experts, 2002, Antitrust law and enforcement have failed to respond to growing market power in substantial part because many key antitrust precedents—particularly those precedents governing exclusionary conduct—rely on unsound economic theories or unsupported empirical claims about the competitive effects of certain practices. In part for this reason, the antitrust rules constructed by the courts reflect a systematically skewed error cost balance: they are too concerned to avoid both chilling procompetitive conduct and the high costs of litigation, and too dismissive of the costs of failing to deter harmful conduct. Excessively permissive precedents and unsound or unsupported economic claims have, in turn, encouraged overly cautious enforcement policies and overly demanding proof requirements and have discouraged government enforcers and private plaintiffs from bringing meritorious exclusionary conduct cases.18 These developments have likely contributed to an increased incidence and exercise of market power across the U.S. economy.
[7] Antitrust Experts, 2002, Overly lenient antitrust rules have been defended with reference to mistaken and unjustified assumptions—including erroneous claims that markets self-correct quickly, monopolies best promote innovation, firms with monopoly power can obtain only a single monopoly profit, vertical restraints and mergers almost invariably benefit competition even in oligopoly markets, courts and enforcers are manipulated by complaining competitors, and courts cannot tell whether exclusionary conduct harms competition or benefits it. Each of those mistaken assumptions leads courts to underestimate the likelihood antitrust violations and the resulting harm.
[8] From Brandeis to Stiglitz Into and Beyond The 2020 Election: Brandeis Protocol and the Stiglitz Model of Pragmatic Progressive Capitalism, hereafter WP#1.
[9] This happened twice during his life, with the Clayton Act (1914) and the Robinson Patman Act (1936).
[10] Stigler Center,, 2020.
[11] WP#1.
[12] *Pragmatic, Progressive Capitalism at Its Best: Network Neutrality:How an Entrepreneurial State Used Public Policy to Foster Experimental Entrepreneurialism and Create the Internet* (hereafter WP#2).
[13] Stigler Center, 2020, p. 2
[14] Id.
[15] Id., p. 3.
[16] Id., p. 3.
[17] Cooper, 2014a, 2017b.
[18] Business data services: Irrational Exuberance for Deregulation: The Failure of Free Market Fundamentalism to Promote Competition or Prevent Abuse of Market Power (hereafter WP#3).
[19] Cooper, 2016b, 2017b.
[20] This is also called "the changing technology of technical change." *Id.* at 112.
[21] *See* Shapiro & Varian, *xx*
[22] *Id.* at 22-23.
[23] Greenstein, 2000, p. 155.
[24] von Hippel, 1998, *Economics Of Product Development By Users: The Impact Of 'Sticky' Local Information*, 44 MGMT. SCI. 629, 642 (1998).
[25] Arora et al.,
[26] *Id.*
[27] von Hippel, 2005.
[28] *Id.* at 277.
[29] Id., pp. 276-77.
[30] *Id.*
[31] *Id.*
[32] Weber, xx, p. 155.
[33] *Id.*
[34] von Hippel, 2005, 57.
[35] Weber, *xx*, pp. 83-84.
[36] Lupia & Sin, *xx*, pp. 329.
[37] Id.
[38] *See generally* Ostrom, et al., *supra* note 45, at 319.
[39] *Id.*
[40] *Id.* at 220.
[41] *Id.* at 296.
[42] Solow, 1987.
[43] IMF, 2018.
[44] While the U.S. has witnessed similar high level analyses of GDP growth, as discussed in WP#3, and interesting set of micro level studies examines the impact on consumer welfare changes and specific Internet services. See for example: Nakamura, Samuel and

Soloveichik, 2018; Brynjolfsson, Erik, et. al. 2019; Chen, Young and Kim, 2010; Brynjolfsson, Erik Avanish Collins and Felix Eggars, 2019.

[45] Sallet's critique of the simplistic neo-Brandeisian arguments is certainly valid, but I want to take it a step farther. Brandeis is being more severely misused and abused by the neo-Brandeisians in the following sense. Brandeis was one of the great American progressives. He started in economics, but ended up leading in areas which were not really economic, as I will define them – privacy and democracy. More importantly, he died before he had a chance to witness what progressive policy (1939), expressed most fully in the late New Deal that he played a key role in creating, could do. Whether or not he would have acknowledged the accomplishments of the post-war New Deal era and adjusted his economic thinking, we will never know, but short-sightedness is not something he suffered from and it is extremely important to avoid. To appreciate the importance of this possibility, we can turn back to interestingly, Piketty, 2014, p. 10, had observed that Marx under-estimated the resilience of capitalism because of when his ideas were formed and offers a similar explanation. "[Marx,] [l]ike his predecessors, totally neglected the possibility of durable technological progress and steadily increasing productivity, which is a force that can to some extent serve as a counterweight to the process of accumulation and concentration of private capital. He no doubt lacked the statistical data needed to refine his predictions. He probably suffered as well from having decided on this conclusion in 1848." The turn toward progressive policies at past critical junctures is the focal point of this analysis because we are at a critical juncture in the digital industrial revolution. Acemoglu and Robinson, 2015, p. 3, date the first progressive turn of the capitalist political economy to the 1820s and 1830s, long before Marx's conclusion that capitalism was doomed to extinction. They argue that Marx's laws fail "Mostly because they ignored both the endogenous evolution of technology . . . and the role of institutions and politics that shape markets, prices and the path of technology. . .. The distribution of the gains from new technologies was also shaped by an evolving equilibrium. The Industrial Revolution went hand-in-hand with major political changes." Stiglitz's critique of Thomas Piketty's *Capital,* which holds an important place in the debate, captures the need for this understanding and the need for a balance of progressive policies and markets. Taken together, these proposals would make real inroads into reducing inequality, returning us to an economy more like that of the post-war years. Those were the years when America was becoming the middle-class society it had long professed to be, with decades of rapid growth and widely shared prosperity, when those at the bottom saw their incomes grow faster than those at the top. They are also the years that Thomas Piketty views as an anomaly in the history of capitalism. But getting back to that time doesn't require eliminating capitalism; it requires eliminating the market distortions of the ersatz capitalism practiced in this country today. This is less about economics than it is about politics. We don't have to choose between capitalism and fairness. We must choose both (Stiglitz, 2014.)

[46] Stigler Center, 2019, p.124. .

[47] Id., p. 27.

[48] Id., p. 26.

[49] Id., p. 27.

[50] Id., p. 29.

[51] Id., p. 88.

[52] Id., p. 27.

[53] Id/. P. 27.

[54] Id., p. 28.

[55] Id., pp. 52-53.

[56] Id., pp. 52-53.

[57] Id., p. 29..

[58] Id., p. 30.

[59] As the introductory essay showed, Pitofsky, 2008.

[60] Xx Behavioral economics

[61] Petiti, xx.

[62] Cooper, Microsoft. xx

[63] Id., xx. xx

[64] Id., p. 32.

[65] Petit, xx, xx

[66] Sullivan, 1977, pp. 1216-1217.

[67] Id., p. 1218.

[68] Id., p. 1219.

[69] Id., p. 1223.

[70] Id., p. 1224, Industrial organization theorists, who insist upon the existence of a functional relationship between market structure and market conduct, have tended to regard the structure of the industry rather than the conduct of the firm as the variable that antitrust policy should be used to influence. It may well be that this emphasis should be reversed.

[71] Id., p. 1224.

[72] Id., p. 1225,Chicago analysts are likely to assume a monopolist will produce to the point where marginal cost and marginal revenue intersect and will price to clear the market.48 This yields the highest short run monopoly profit, but also does the most to attract entry. Harvard theorists are more likely to assume a limit pricing strategy, which will be calculated to yield a supra-competitive, though lower, return over a longer period. Harvard school analysts are more likely to utilize longer run or dynamic models, and thus to increase the realism, if also the complexity, of the analysis.

[73] Id., pp. 1220-1221.

[74] Id., p. 1223.

[75] Id., p. 1222.

[76] Id., p. 1232.

[77] Id., pp. 1232-1233

[78] Id., pp. 1233…1234.

[79] Id., p.1233.

[80] Kahn, 1988, p. 11.

[81] Id.
[82] Cooper, 2014b.
[83] This remains true, even in the case of a recent example in the digital age – peering between interconnected networks. For a significant period, the national transmission networks engaged in unbilled interconnection and carriage. That approach worked well, only as long as it did not matter. As soon as the networks became differentiated by size or market, voluntary unbilled peering broke down. Big charged little and transmission dominant networks (those who simply transported the bits) charged eyeball heavy networks (those who were selling the content to their customers). Commercial negotiations became contentious and disputes and disruptions occurred.
[84] Cooper, 2014b.
[85] Id.
[86] Id. at 114.
[87] Taylor, 1994, p. 262, "Taylor identifies three characteristics of necessities – inability to replace the good, large relative size of the expenditure, and importance of the good in a broad sense. 'The point of departure will be to remind ourselves of a point this is probably too often forgotten: that price elasticity consists of two components, an income effect and a substitution effect. The substitution effect is a measure of the extent to which goods and services can substitute for one another when there is a price change without making the consumer any worse off in terms of consumer welfare. The income effect, on the other hand is a measure of the extent to which the consumer's real income is changed when there is a change in price. Ordinarily, the importance of the income effect is represented by the importance of the good whose prices has changed in the consumer's budget. Goods whose expenditure account for a small proportion of the consumer's total expenditures will have a small (or even tiny) income effect, while a good whose expenditures account for a large portion of total expenditure will have a possibly large income effect. Goods that in ordinary discourse are seen as necessities (such as heating fuels and telephone service) will also have relatively larger income effects the lower the level of income."
[88]Id., p. 262, "In assessing income effects, however, a point that is usually overlooked is the effect on the consumer's welfare of not consuming a good because of a price increase. In the case of making or not making a phone call because it has become more expensive, the question that needs to be asked is what are the consequences (not necessarily in monetary terms) of not making the call. For residential consumers, this cost is usually cast in term of the utility (or satisfaction) that is given up by the call not being made. For many calls, however, this is not the correct measure of cost, for the call may be important to the *earning* of income. In this case, the actual income effect of not making a telephone call may be large, although the decrease in real income, (as customarily measured), occasioned by the price increase may be extremely small.
[89] Kahn, 1998, p. 11.
[90] Associated Press, 1945.
[91] Cooper, 2013, 2016.
[92] Stigler Center, 2020, p. 89.
[93] Kwoka, 2015.
[94] Id., p. 14
[95] Antitrust Experts, 2020.
[96] Id., p. 12.
[97] Cooper, 2003,
[98] Blackstone, in Speta, 2002,
[99] Hocket, in Speta, 2002.
[100] Cooper 2003
[101] Cooper, 2013.
[102] Von Hipple, 2005.
[103] Cooper, 2013.
[104] Michal Powell belittled the concept of the public interest in his first speech upon becoming a member of the Commission, xx
[105] xx
[106] A compromise approach, like the framework for interconnection in wireless roaming based on negotiations between parties with the agency asserting clear authority of situations where an agreement could not be reached, may be an attractive "lite-handed" approach, if it does not undermine the *ex ante* nature of access that is central to innovation at the edges without permission.
[107] Stigler Center, 2020, p. 14.
[108] Id., p. 16.
[109] Id., p. 19.
[110] Id., p. 19.
[111] Id., p. 21.

Antitrust and Economic Regulation: Essential and Complementary Tools to Maximize Consumer Welfare and Freedom of Expression in the Digital Age

Gene Kimmelman and Mark Cooper***

I. Purpose and Outline

A. Approach

Digital communications platforms,[1] whether offered by a cable, telecommunications, or Internet services company, deliver some of the most important video and Internet content and communications that fuel our democracy, power our economy, and educate our citizenry. However, the economics of these platforms and natural incentives of platform owners create enormous opportunities for competitive abuse and consumer harm unless vigorous public oversight corrects these market imperfections. Dominant broadband service providers like Comcast, Verizon, and AT&T have both the incentive and the ability to cut sweetheart deals with affiliated or favored content providers to maximize profit at the expense of consumers. Service providers' behavior needs to be constrained by antitrust enforcement and regulation that protects affordable consumer access and the free flow of information.

Under U.S. law, antitrust enforcement is one critical element necessary to protect consumers and the competitive process. Yet antitrust, by itself, is not enough to harness the marketplace benefits, like competition and efficiency, and potential progressive societal advancements, like universal service and freedom of expression, that digital communications platforms offer. Only with appropriately tempered regulatory oversight and strict antitrust enforcement can cable, telecom, and wireless broadband service providers be driven to offer competitive, nondiscriminatory, innovative, and socially

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[1] These are communications networks made up of a transmission medium (e.g., fiber optic or wireless radio and servers and switches connected to end user devices like routers, computers, televisions, or game consoles).

beneficial video and broadband services that maximize consumer welfare in both the economic market and marketplace of ideas.[2]

The challenges that policymakers face in stewarding the digital communications sector along a path that promotes and protects its dynamic innovation, while ensuring it delivers socially beneficial progress, is symbolized by two huge policy issues that government agencies had to confront in 2015. Would the Department of Justice (DOJ) and the Federal Communications Commission (FCC) raise substantial concerns about the proposed merger of Comcast and Time Warner?[3] With or without the merger, how would the FCC's Open Internet Order ensure the neutrality and openness of the Internet, assuming it survives an inevitable court challenge?[4]

Antitrust enforcement and economic regulation are both vitally and equally necessary to protect consumer welfare in the digital age. This article examines the historic and contemporary role of antitrust and economic regulation in the American communications sector. In fact, given the special role of communications in society and its growing importance in both economics and politics, we argue that a well-performing communications sector is possibly the single most important pillar on which a progressive, democratic capitalist society must stand in the twenty-first century. Communications platforms that support diverse viewpoints, do not discriminate based on content, and promote innovation and competition are critical to increasing social, economic, and political opportunities for the American people.

This article is an analysis of the political economy of antitrust and regulation in the communications sector in the traditional sense of the term, which entails the direct relationship of political action to influence the economy through policy.[5] To put the matter bluntly, we believe it is naïve at best, immoral at worst, to think that politics and policy do not define the structure and outcomes of the economy. Policymakers must not forgo the opportunity to address market failures and imperfections that harm consumers, like an-

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[2] The "marketplace of ideas" belief holds that the truth will emerge from the competition of ideas in free, transparent public discourse. This concept is often applied to discussions of patent law as well as freedom of the press and the responsibilities of the media in a liberal democracy.

[3] Comcast-Time Warner Cable, FCC MB Docket No. 14-57, FCC, http://perma.cc/MC9Q-HZEF.

[4] Protecting and Promoting the Open Internet, 80 Fed. Reg. 19,738 (Apr. 13, 2015) (to be codified at 47 C.F.R. pts. 1, 8, & 20).

[5] DAVID W. PEARCE, THE DICTIONARY OF MODERN ECONOMICS 342 (rev. ed. 1983). Given this orientation, this document reflects analyses submitted in the policymaking process including congressional testimony. *See Examining the Comcast-Time Warner Cable Merger: Hearing Before the S. Comm. on the Judiciary*, 113th Cong. 1–8 (2014) (statement of Gene Kimmelman, President and CEO, Public Knowledge), *available at* http://perma.cc/S4XR-WSPB; *see also Competition in the Evolving Digital Marketplace: Hearing Before the Subcomm. on Courts and Competition Policy of the H. Comm. on the Judiciary*, 111th Cong. 107–39 (2010) (statement of Mark Cooper, Director of Research, Consumer Fed'n of Am.), *available at* http://perma.cc/6QLP-24RH (citing MARK COOPER, CONSUMER FED'N OF AM., BUYER AND BOTTLENECK MARKET POWER MAKE THE COMCAST-TIME WARNER MERGER "UNAPPROVABLE" (2014), *available at* http://perma.cc/W4ZM-C7Z9 [hereinafter COOPER, UNAPPROVABLE]).

ticompetitive or discriminatory actions, or promote the public interest, like ensuring universal service and diversity in expression.

B. Outline

The American approach to providing a national communications network embodied in the application of the antitrust laws (like the Sherman Act of 1890) and regulation (like the Mann-Elkins Act of 1910, the Communications Act of 1934, and the Telecommunications Act of 1996) can be described as progressive capitalism.[6] Rather than use state-owned monopolies, the United States relied on private firms operating under public interest principles. Although this arrangement imposed constraints on property, the incentive to invest was still strong. Moreover, the opportunity to increase the role of competition was always present. As argued throughout this article, the digital revolution was born as a result of pro-competitive actions of both antitrust enforcement and regulatory oversight.

In Part II, we lay out the analytical, normative, and historical grounding of the political economy of progressive democratic capitalism in the American experience. We start with the analytical and normative structure of our approach and then turn to a brief review of the long history of the relationship between antitrust and economic regulation in the communications sector. The purpose of Part II is to refresh the reader's memory about the progressive, democratic roots of capitalism in America and its key role in creating the success of the economy.

In Part III, we examine the recently withdrawn Comcast-Time Warner merger as an example of the challenge for antitrust in the digital age. As a merger between two of the top four providers of video and broadband Internet access service, this proposed merger raised a host of antitrust concerns, highlighting the continuing relevance of antitrust enforcement in the digital age and the need to evolve antitrust practice to cope with new technologies.

In Part IV, we present our empirical analysis of Open Internet and network neutrality issues as a regulatory challenge. Here we show that policies to ensure nondiscriminatory access to the data network played a key role in creating the environment in which the Internet was born and thrived. Preserving that principle is at the heart of the network neutrality debate. The analysis also shows why regulatory policy beyond antitrust is necessary to preserve network neutrality.

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[6] Earlier pieces develop key aspects of the intersection of these two types of public interest oversight. *See* Mark Cooper, Director of Research, Consumer Fed'n. of Am., Cato Inst. Hill Briefing: Restoring the Balance of Public Values and Private Incentive in American Capitalism (Nov. 1, 2002), *available at* https://perma.cc/RF68-VXPB; Mark Cooper, *Antitrust as Consumer Protection in the New Economy: Lessons from the Microsoft Case*, 52 HASTINGS L.J. 813 (2001).

The article concludes in Part V by identifying the general challenges grounded in the two case studies, as well as other antitrust and regulatory actions that are beginning to meet the challenges.

II. The Performance of the Communications Sector and Progressive, Democratic Capitalism

Given the limitations of space and the focus of this volume, we adapt the frameworks offered by a small number of well-known thinkers and do not spend time debating or defending the reason for choosing the concepts.

A. The Economic Aspect of Antitrust and Regulation

In this Part, we specify the fundamental economic goals of antitrust and regulation, which we define as "good market performance," following the approach by F.M. Scherer and David Ross's leading text,[7] which also argues that "good market performance" has immense value to support the proper function of democracy.

Paraphrasing Scherer and Ross, we use a "multidimensional" definition of good performance that embodies an interconnected set of goals, each of which is progressive in a different way. The economy should:

- use resources efficiently and try to increase efficiency, in responding to consumer demands;
- take advantage of the opportunities opened up by science and technology to increase output, and provide consumers with superior new products;
- achieve long-run growth in per capita income by facilitating stable full employment of resources, particularly human resources, and distribute income equitably.

In spite of the difficulties in measuring the outcomes (as suggested in Figure 1 by the effort to develop measures of "workable competition"), from the strictly economic point of view, "[c]ompetition has long been viewed as a force that leads to an ideal solution of the economic performance problem."[8] This is because "competitive market systems . . . display generally greater responsiveness to consumer demands and generate more potent incentives for the frugal use of resources than do monopoly market structures."[9]

The framing of the analysis encapsulated in Figure 1 highlights several issues that are prominent in the following discussion. It underscores the importance of consumer demand and human needs (full employment of human

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[7] F. M. Scherer & David Ross, Industrial Market Structure and Economic Performance (3d ed. 1990).

[8] *Id.* at 15.

[9] *Id.* at 52.

resources and equity). It identifies the importance of antitrust and regulation in shaping the economy. Many of the key structural aspects of markets that require policy efforts to move markets toward workable competition and address the harms that result when markets fail will be invoked below to explain the role of antitrust and economic regulation in the communications sector.

By juxtaposing competition with monopoly, the framing in Figure 1 highlights some of the central challenges in the communications sector: its origin as a regulated monopoly, the struggle to promote workable competition (e.g., the largest breakup of a corporation in U.S. history), as well as the continuous concern about mergers. The purpose of antitrust is to protect competition in markets. The mechanism by which antitrust is expected to protect competition is to prevent market conditions that weaken or undermine competition. In this regard, it generally operates in an *ex post* manner, after abuses have occurred and harm has been done to competition and consumers, with the hope that corrective action and penalties (treble damages) dissuade future bad behavior. The most important exception to the *ex post* approach is merger review, which allows the DOJ and Federal Trade Commission (FTC) to block mergers before they take place, if they are deemed likely to harmfully reduce competition.

Complementing antitrust policy, economic regulation reinforces the effort to prevent harm to competition and consumers in aspects of market behavior that antitrust cannot reach or is not likely to reach in a timely manner. In contrast to antitrust, which prevents market failure in an *ex post* manner, regulation promotes market success in an *ex ante* fashion, making it more prophylactic.[10] Moreover, economic regulation has another and even more important function—it can implement policies that actively promote market success.

The broad purposes and functions of antitrust and regulation in the economy are magnified when applied to the communications sector. From an economic point of view, the communications sector is one of the most important resource systems in an advanced economy, since market efficiency depends on the ability to gather and process information.[11]

Communications networks possess two characteristics that make them ideal candidates for economic regulation—their infrastructural nature and economies of scale. Kahn identified these characteristics in his seminal work, *Economics of Regulation.* Making the case for economic regulation, Kahn pointed to the fact that because communications networks exhibit economies of scale, the market will support only a small number of large

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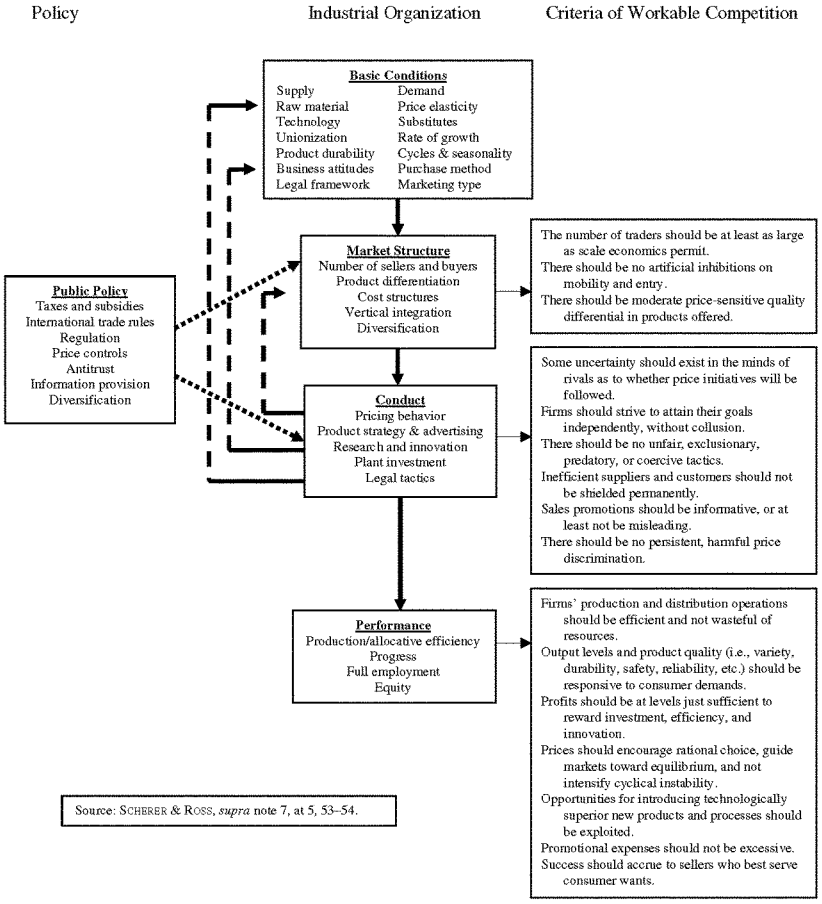
[10] *Id.* at 12 (noting that antitrust is an "episodic," "surgical intervention," and a "North American invention").

[11] *See* Erick Brynjolfsson, MIT Center for Digital Business, Address at NITRD Symposium: Impact of Networking and Information Technologies on Productivity and Innovation (Feb. 16, 2012), slides available at http://perma.cc/M3W7-YKKD; *see also* STANDARD CHARTERED, TECHNOLOGY: RESHAPING THE GLOBAL ECONOMY (2015), *available at* https://perma.cc/Y634-PKR2.

FIGURE 1: THE STRUCTURE-CONDUCT-PERFORMANCE PARADIGM



firms compared to other sectors of the economy.[12] In addition, because of the essential inputs they provide, they influence the growth of other sectors of the economy.[13] Kahn added two other characteristics: "natural monopoly" and "for one or another of many possible reasons, competition does not work well."[14] Although Kahn was skeptical of the monopoly rationale for regulation, he later argued that the nature and extent of competition is an empirical question:

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[12] 1 ALFRED KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 11 (1988).

[13] *Id.*

[14] *Id.*

> The question is not simply one of *how much* competition to allow—how much freedom of entry or independence of decision making with respect to price, investment, output, service, promotional effort, financial, and the like. It is a question also of what, in the particular circumstances of each regulated industry, is the proper *definition,* what are the *prerequisites*, of effective competition.[15]

Of course, as noted above, Scherer and Ross also believe that the implementation of policy in pursuit of competition as the desired structure for markets must reflect the fundamentals of economic structure and the reality of markets.

B. The Political Aspect of Antitrust and Regulation

From a political perspective, we note that communications involves speech, and that freedom of speech, although a cornerstone of democracy,[16] does not trump simple economics.[17] Indeed, communications is considered a human right.[18] However, there is no conflict between the aspiration for competitive markets and political democracy. On the contrary, when Scherer and Ross make "the case for competition" in the economy, they choose to "begin with the political arguments . . . because when all is said and done, they, and not the economists' abstruse models, have tipped the balance of social consensus toward competition."[19] They offer three reasons for the close association between markets and democracy:

> One of the most important arguments is that the atomistic structure of buyers and sellers required for competition decentralizes . . . power. . . . Limiting the power of both government bodies and private individuals to make decisions that shape people's lives and fortunes was a fundamental goal of the men who wrote the U.S. Constitution. . . . A closely related benefit is the fact that competitive market processes solve the economic problem *impersonally,* and not through the personal control of entrepreneurs and bureaucrats. . . . A third political merit of a competitive market is its freedom of opportunity.[20]

There is an extensive school of political philosophy that embraces a strong link between property ownership in market economies and democracy, which has been significantly influenced by John Rawls and his stu-

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[15] *Id.* at 114.

[16] *See* Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting).

[17] *See* Associated Press v. United States, 326 U.S. 1, 20–21 (1945).

[18] *See* United Nations Universal Declaration of Human Rights, G.A. Res. 217 (III) A, U.N. Doc. A/RES/217(III) (Dec. 10, 1948).

[19] SCHERER & ROSS, *supra* note 7, at 18.

[20] *Id.* at 18–19.

dents.[21] One of them, Elizabeth Anderson, provides a comprehensive theory of distributive justice, which she calls "democratic equality," that presents a broad basis for understanding the relationship between progressive capitalism and democracy.[22] It weds capitalism to democracy through the observation that property is not natural, but always socially defined. She charts the historical development of placing constraints on property during the capitalist era as progress toward democracy, identifying five features of advanced democratic capitalism: the provision of public goods (broadly defined to include roads, public health and schools), economic and environmental regulation, social insurance, and the right of labor to organize. She concludes that: "[T]hese five should be seen as developments internal to the dynamics of democratic capitalism itself, rather than borrowings from fundamentally alien economic systems. . . . They are integral parts of advanced capitalist democracies."[23]

While the analysis of range-constraints on markets tends to focus on income distribution, we see these principles more broadly. From our point of view, antitrust and regulation are two of the most important constraints that American policy places on markets to ensure that they remain on a dynamic, progressive path.

C. The Interplay Between Antitrust and Economic Regulation in the American Communications Sector

The five features of advanced democratic capitalism identified by Anderson above are arranged in the rough historical order in which they were adopted, with the provision of public goods and economic regulation found in the early days of the Republic.[24] At the time, roads were the network over which communications flowed and the dedication to the post office was a very strong commitment to a democratic means of communications.[25] Economic regulation and antitrust were focal points of policy activity in the late nineteenth century as large corporate entities—above all, the railroads—became more important and ultimately dominant in the economy.

Antitrust and regulation have been intertwined in the telecommunications industry from the earliest days of the communications industry and progressive legislation (see Table 1). In 1890, the Sherman Act[26] provided the DOJ with a "comprehensive charter of economic liberty aimed at pre-

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[21] *See* Leif Wenar, *John Rawls*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Sept. 24, 2012), http://plato.stanford.edu/entries/rawls/, http://perma.cc/8K2R-YYV4.

[22] Elizabeth S. Anderson, *What is the Point of Equality?*, 109 ETHICS 287, 289 (1999).

[23] Elizabeth Anderson, *Toward a Post Cold-War Political Economy*, LEFT2RIGHT (Jan. 9, 2005), http://perma.cc/HP6H-4ZPE.

[24] *See* PAUL STARR, THE CREATION OF THE MEDIA 16 (2004) (discussing early economic regulation and the postal service).

[25] The post office is mentioned in the U.S. Constitution, U.S. CONST art. I, § 8, cl. 7, while the press is only mentioned in the First Amendment, U.S. CONST. amend. I.

[26] Sherman Act, ch. 647, 26 Stat. 209 (1890) (codified as amended at 15 U.S.C. §§ 1–7 (2012)).

serving free and unfettered competition as the rule of trade."[27] The Sherman Act outlaws "[e]very contract, combination . . . or conspiracy, in restraint of trade,"[28] and any monopolization, attempted monopolization, or conspiracy or combination to monopolize.[29] The telephone industry became the target of one of the first antitrust consent decrees under the Sherman Act.[30] In addition, the telephone industry was the focus of a continuing series of complaints and consent decrees that culminated in the largest divestiture of private property ever required in an antitrust case—the breakup of AT&T[31]—some seven decades after the initial consent decree. Ongoing antitrust oversight of the industry was one factor behind the Telecommunications Act of 1996.

TABLE 1: THE LONG HISTORY OF DUAL OVERSIGHT IN THE COMMUNICATIONS SECTOR

Year	Regulation	Antitrust
1887	Interstate Commerce Act	
1890		Sherman Act
1910	Mann-Elkins Act	
1913		AT&T/DOJ Consent Decree
1914		FTC Act
1927	Radio Act	
1934	FCC Act	
1945		Associated Press
1949		Final Judgment
1956		Modification of Final Judgment
1968	Carterfone and Computer Inquiries	
1969	Red Lion	
1984	Spread spectrum decision leading to cable deregulation	Break-up of AT&T
1987		Triennial reviews begin in the antitrust court
1992	Cable Reregulation (Consumer Protection Act)	
1996	Telecom Act of 1996	

[27] N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958).

[28] 15 U.S.C. § 1 (2012). The scope of this language was limited from the very first cases brought under the statute. "Undue" restraints on trade were actionable if they resulted in identifiable harms, e.g., higher prices, reduced output, or reduced quality. *See* Standard Oil Co. of New Jersey v. United States, 221 U.S. 1, 54–55 (1911).

[29] 15 U.S.C. § 2 (2012).

[30] *See* William J. Donovan and Breck P. McAllister, *Consent Decrees in the Enforcement of Federal Antitrust Laws*, 46 HARV. L. REV. 885, 927 (1933) (discussing a 1914 consent decree approved by the United States District Court for the District of Oregon in *United States v. American Telephone & Telegraph Co.*, 1 Decrees & Judgments in Civil Federal Antitrust Cases 554 (D. Or. 1914)). The first consent decree was entered in *United States v. Otis Elevator* in 1906. *See* Charles F. Phillips, Jr., *The Consent Decree in Antitrust Enforcement*, 18 WASH. & LEE L. REV. 39, 42 (1961).

[31] *See* United States v. Am. Tel. & Tel. Co., 552 F. Supp. 131, 160–70 (D.D.C. 1982).

2003	Cable Modem Order	
2005	Madison River	
2005	Wireline Broadband Order	
2010	Open Internet Neutrality Order Comcast/NBCU Merger Conditions	Comcast-NBCU Consent Decree
2011	AT&T/T-Mobile Challenged/ Withdrawn	
2013	Data Roaming Order	
2014	Open Internet Order Remanded Universal Service Reform Upheld	
2015	Comcast-Time Warner Merger Review	Comcast-Time Warner Merger Review

In 1887, the first federal regulatory agency created in the Progressive Era—the Interstate Commerce Commission[32]—was given the authority to prevent railroad corporations from charging rates that were "unjust," "unreasonable," "unjustly prejudicial," or "discriminatory." The Mann-Elkins Act of 1910 quickly extended the Interstate Commerce Act to the telephone network.[33] The Communications Act, which shifted communications regulation to a new agency at the height of the New Deal era, was quite progressive and pragmatic in its goals, making the first task of the agency:

> [T]o make available, so far as possible, to all people of the United States . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purposes of national defense, for the purpose of promoting safety of life and property through the use of wire and radio communications, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication.[34]

For fifty years under the regulated monopoly status of the telecommunications industry, this goal had been pursued largely with internal implicit subsidies to provide resources within the franchise monopoly telecommunications companies under the oversight of federal and state regulators. With the breakup of the monopoly, attention shifted to the local phone companies. A significant part of the motivation for the Telecommunications Act of

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[32] *See* Interstate Commerce Act of 1887, ch. 104, 24 Stat. 379.

[33] Mann-Elkins Act, ch. 309, 36 Stat. 539, 545 (1910).

[34] Communications Act of 1934, Pub. L. No. 73-416, 68 Stat. 1064 (codified as amended at 47 U.S.C. § 151 (2012)). The New Deal involved legislation in all five areas identified by Anderson, *supra* note 22, as representative of the progressive commitment of advanced capitalism. The Communications Act's broad language is similar to the language in other laws of the period. For example, the purpose of the Social Security Act of 1935 is "[t]o provide for the general welfare by establishing a system of Federal old-age benefits, and by enabling the several States to make more adequate provision for aged persons, blind persons, dependent and crippled children, maternal and child welfare, public health, and the administration of their unemployment compensation laws." Social Security Act, Pub. L. 74-271, 49 Stat. 620 (1935).

1996[35] was to codify the regulatory concepts that the FCC had developed over the previous thirty years and adapt them to the new economic structure where competition was expected to play a larger role. The development of economic regulation after the 1996 Act is discussed in Part IV below.

It is not an exaggeration to say that the success of the modern communications sector rested on this dual oversight of the industry, which strove to keep it as competitive as possible and pressed it toward progressive goals, given the available technologies. While the nature and extent of regulatory and antitrust oversight of these industries has evolved over the course of almost a century and a half,[36] space does not allow us to review these developments in detail.

Antitrust cases continuously protected competition on the platforms that make up the digital communications sector, with the most notable example being the AT&T breakup. Here, we merely note that dual jurisdiction has been an enduring and extremely successful feature of the legal landscape.[37] This dual jurisdiction frequently interacts with antitrust-driven development later incorporated into economic regulation. Importantly, this balanced, shared oversight has continued into the digital era. FCC policy decisions over the course of a decade (Carterfone,[38] Computer Inquiries,[39] and spread

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[35] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (codified as amended at 47 U.S.C. § 151 et seq. (2012)).

[36] As is frequently the case in the U.S. federal system, state activity in these areas preceded and laid the groundwork for federal action.

[37] There are, of course, many instances in which regulation gets in the way of competition and many of these were addressed in the 1996 Act, the purpose of which, as described in the conference report, was "to provide for a pro-competitive, de-regulatory national policy framework designed to accelerate rapidly private sector deployment of advanced . . . information technologies and services to all Americans by opening all telecommunications markets to competition." H.R. REP. No.104-458, at 1 (1996) (Conf. Rep.). Among the most prominent examples were removal of barriers to entry into local telephone service, *id.* at 16–17, and telephone company entry into video services, *id.* at 66.

[38] *See* Thomas F. Carter, 13 F.C.C.2d 420 (1968).

[39] *See, e.g.*, Regulatory and Policy Problems Presented by the Interdependence of Computer and Commc'ns Servs. and Facilities, 28 F.C.C.2d 291 (1970) (tentative decision of the Commission); Regulatory and Policy Problems Presented by the Interdependence of Computer and Commc'ns Servs. and Facilities, 28 F.C.C.2d 267 (1971) (final decision and order of the Commission); GTE Serv. Corp. v. FCC, 474 F.2d 724 (2d Cir. 1973) (reviewing the FCC's promulgated rules after the *First Computer Inquiry* distinguishing between communications subject to regulation and data processing not subject to FCC regulation, requiring telephone carriers to maintain separate corporate structure to provide enhanced services, and affirming the FCC's authority "to promulgate rules regulating the entrance of communications common carriers into the nonregulated field of data processing services," but finding that rules aimed at regulating the affiliate corporations directly were outside the scope of the FCC's jurisdiction); Regulatory and Policy Problems Presented by the Interdependence of Computer and Commc'ns Servs. and Facilities, 40 F.C.C.2d 293 (1973) (order after remand by the Second Circuit); Computer & Commc'ns Indus. Ass'n v. FCC, 693 F.2d 198 (D.C. Cir. 1982) (reviewing FCC's rules overhauling the regulatory scheme following the *Second Computer Inquiry*, holding that the FCC's redrawing of the regulatory line to classify any transmission service as a communication subject to FCC regulation was a reasonable exercise of its statutory authority); California v. FCC, 905 F.2d 1217 (9th Cir. 1990) (finding the FCC's attempt following the *Third Computer Inquiry* to remove structural separation barriers to be arbitrary and capricious because its calculation of the costs against the benefits of open Internet was insupportable).

spectrum[40]) that ensured open access to and nondiscriminatory treatment of traffic on the communications network were critical to create an environment in which the Internet grew to dominate communications. The explosion of innovation that followed, discussed in more detail below, was made possible in part by the FCC's decision to order AT&T to allow user-chosen equipment to be attached to its network (through a standard jack), which resulted in the development and, ultimately, the ubiquitous deployment of consumer-owned modems. The nearly simultaneous decision to require AT&T to pass data transmitted over the network in a nondiscriminatory manner invited innovation in services to use the modems.

III. Antitrust Concerns about the State of Competition in the Cable/Broadband Market

A. A Goliath that Threatens Competition and Consumers

In February 2014, the nation's largest cable company, Comcast, announced its planned $45.2 billion acquisition of the nation's second-largest cable company, Time Warner Cable, which triggered the dual review noted above. The antitrust division of the DOJ began its review process of the merger in March,[41] and in April, Comcast submitted its public interest statement to the FCC to obtain permission for the merger.[42] *The Economist* magazine's evaluation of the merger encapsulated the problem with the recently withdrawn transaction:

> The deal would create a Goliath . . . . For consumers the deal would mean the union of two companies that are already reviled for their poor customer service and high prices. Greater size will fix neither problem . . . . The biggest worry is Comcast's grip on the Internet . . . . Comcast will have extraordinary power over what content is delivered to consumers, and at what speed.[43]

Ultimately, these qualities were rightly deemed so fundamental to the merger that no conditions could sufficiently ameliorate them. After a long and bitter struggle, Comcast very reluctantly abandoned its effort to acquire Time Warner when the staffs of the DOJ and the FCC both recommended that the agencies oppose the merge.[44] The leadership of both agencies appear to have accepted those recommendations (indicating that the DOJ would

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[40] *See* Authorization of Spread Spectrum and Other Wideband Emissions Not Presently Provided For in the FCC Rules and Regulations, 101 F.C.C.2d 419 (1985).

[41] *See* Melissa Lipman, *DOJ Puts A-Team On Comcast-TWC Deal, But Baer Bows Out*, Law360 (Mar. 6, 2014), http://perma.cc/3PTH-MEEZ.

[42] Applications and Public Interest Statement of Comcast Corp. and Time Warner Cable Inc., FCC MB Docket No. 14-57 (Apr. 8, 2014), *available at* http://perma.cc/RXP4-U9YA.

[43] *Turn It Off: American Regulators Should Block Comcast's Proposed Deal with Time Warner Cable*, Economist (Mar. 15, 2014), *available at* http://perma.cc/A9GG-22K9.

[44] Jennifer Saba and Malathi Nayak, *Justice Dept. staff may oppose Comcast-Time Warner Cable deal-Bloomberg*, Reuters (April 17, 2015), http://perma.cc/Y6G5-W4TE; Alex Sher-

pursue a court case and/or the FCC would order a hearing before an administrative law judge).

Exactly one year before the deal came undone, the Consumer Federation of America filed a report and Public Knowledge testified at the Senate Judiciary Committee to the effect that the merger was "unapprovable."[45] The following analysis, based on those early documents, explains why Comcast, which had closed $26 billion in mergers over the previous two decades, had badly overreached.

After years of suffering from enormous rate increases and poor service from Comcast and other providers,[46] a vibrant broadband economy is just beginning to bring exciting new alternatives to subscription television.[47] New devices (such as Roku, Xbox, Amazon's Fire, and AppleTV) and new video services (such as Amazon Prime, YouTube, and Netflix) demonstrate that online video can compete with some elements of traditional cable TV.[48] These new competitors may begin to help consumers avoid overpriced large "tiers" or bundles of channels, many of which force customers to purchase access to channels they do not want simply to access the channels they do want.

We believe that Comcast's proposed acquisition of Time Warner Cable would have threatened the continued viability of nascent competitors and endangered the continued emergence of innovative new video and other types of services delivered over the Internet. The now-withdrawn transaction was inconsistent with antitrust policy, the goals of the Communications Act, and the broader public interest in regards to diversity of viewpoints and freedom of expression.

If the merger had been approved, Comcast would have controlled nearly fifty percent of high speed Internet access in this country, over thirty percent of subscribers of Multi-Channel Video Programming Distributors

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man, et al., *Comcast Deal in Limbo as FCC Said to Join DOJ Against Merger*, BLOOMBERG (April 22, 2015), http://perma.cc/PF6S-RD7T.

[45] COOPER, UNAPPROVABLE, *supra* note 5; *Examining the Comcast-Time Warner Cable Merger: Hearing Before the S. Comm. on the Judiciary*, 113th Cong. 1–8 (2014) (statement of Gene Kimmelman, President and CEO, Public Knowledge), *available at* http://perma.cc/S4XR-WSPB.

[46] *See Comcast Gets Bigger, You Get Poorer*, FREEPRESS.NET, http://perma.cc/RKE9-38TZ.

[47] While some consumers have the option to choose between cable and satellite providers, very few have viable options if they wish to bundle both television and broadband services. At one time, Verizon appeared to be a potential competitor in the combined subscription TV and broadband space, but its FiOS service is offered in only fifteen percent of Comcast's markets and Verizon has no plans to expand that service. Satellite continues to lack a meaningful broadband option to make it a competitor to cable broadband. It appears that AT&T has no plans to devote significant additional resources to expanding U-Verse in the residential broadband space. Google has only committed to a limited number of small experiments. Finally, mobile broadband is a complement, not a substitute.

[48] *See* Shalini Ramachandran, *TV Viewing Slips as Streaming Booms, Nielsen Report Shows: Gains for Online-Video Services Come as Pay TV Shows Early Signs of Decline*, WALL ST. J. (Dec. 3, 2014), http://www.wsj.com/articles/tv-viewing-slips-as-streaming-booms-nielsen-report-shows-1417604401, http://perma.cc/4ZFC-V4GK.

(MVPD) (traditionally defined as cable or satellite companies),[49] and almost sixty percent of cable subscribers.[50] Comcast would also have had a significant presence in nineteen out of twenty of the largest Designated Market Areas (DMAs) in the country.[51] This would have not only added Time Warner holdings in New York City, Los Angeles, and Dallas, but also regional clusters of holdings centered on those cities, as well as major clusters in the Midwest (Ohio/Kentucky) and the Carolinas.[52] It would have dwarfed the closest-in-size cable system (Cox) by a factor of nearly eight times.[53] It would have been over three times as large as the next broadband Internet access service provider (AT&T).[54]

Comcast's increased size would have magnified its status as gatekeeper for both new and emerging Internet services and conventional distribution of content to consumers. This unprecedented accumulation of market power, combined with Comcast's vertical integration into content, would have created the incentive and enormous leverage for Comcast to:

- stifle slowly emerging competition from rivals such as Netflix and Amazon that require high speed Internet access to deliver quality service to their customers, thwarting not only competition from existing rivals but discouraging investment in new innovative services delivered over the Internet;
- slow the pace and dictate the direction of equipment, device, and service innovation to lock in maximum revenue for Comcast's own infrastructure and business model;
- pay content suppliers less than the market value of their products and services, driving up the cost of programming to other distributors and increasing prices to consumers;
- artificially raise the prices of Comcast-owned programming to Comcast rivals, thus hampering their ability to compete and raising prices for consumers; and
- position itself as the dominant gatekeeper for all new services (both video and non-video) that rely on fast, reliable broadband connections to reach customers.

The intense scrutiny that Comcast brought upon itself and other large communications firms with its proposed mergers (as discussed in this Part) and its actions as the dominant broadband Internet access provider (as dis-

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[49] *See* Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Fifteenth Report, 28 FCC Rcd. 10,496, 10,560–61, ¶ 137, Table 9 (2013).

[50] *See* COOPER, UNAPPROVABLE, *supra* note 5, at 6.

[51] Comcast Co., Time Warner Cable Inc., Comcast Filing (Form 425) 5 (Feb. 13, 2014), *available at* http://perma.cc/RLQ9-KS8T.

[52] *Id.* at 6.

[53] Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Fifteenth Report, 28 FCC Rcd. 10496, 10560–61, ¶ 137, Table 9 (2013).

[54] *See* Joint Petition to Deny of Consumer Fed'n of Am., Consumers Union, Free Press and Media Access Project, FCC MB Docket No. 10-56 (June 21, 2010), *available at* http://perma.cc/XD7W-33T9.

cussed in the next Part) revealed that these are not idle, theoretical concerns; they are very real in the current communications market. To appreciate the implications of the merger and the broader issues it raises, it is important to examine the consent decree Comcast entered into in its previous acquisition of NBC Universal just four years prior to proposing the merger with Time Warner.

B. The Legal and Policy Implications of the Comcast-NBC Universal Merger

In the 2010 public interest filing and expert testimony accompanying the request for the transfer of broadcast licenses from NBC Universal (NBCU) to Comcast, Comcast took the position that because it was largely a vertical merger and all of the market segments involved were vigorously competitive, the merger posed no actual or potential threat to competition, consumers, or the public interest.[55] In 2011, the DOJ[56] and FCC[57] rejected Comcast's arguments and analyses, finding that the merger posed significant threats and could not be approved without substantial remedial actions and ongoing conditions.

The FCC noted that the "record here is replete" with e-mails and documents from Comcast and other cable industry executive showing that Online Video Distribution (OVD) poses a potential threat to their business, "and that NBCU feels pressure to avoid upsetting those companies with respect to any actions it might take regarding the online distribution of its content."[58] Similarly, the DOJ recognized the competitive dangers inherent in Comcast's vertical integration into content with its merger with NBCU:

> Comcast has an incentive to encumber . . . the development of nascent distribution technologies . . . by denying OVDs access to NBCU content or substantially increasing the cost of obtaining such content. As a result, Comcast will face less competitive pressure to innovate, and the future evolution of OVDs will likely be muted [and] will lessen competition in video programming distribution.[59]

Comcast could have challenged the conclusions reached by the DOJ and FCC and gone to court to prove that the agencies were wrong. It chose not to do so. The core concern in the Comcast-NBCU merger was Comcast's significant market share at key points in the supply chain of video and com-

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[55] Applications and Public Interest Statement of General Electric Company, Transferor, to Comcast Corporation, Transferee, FCC MB Docket No. 10-56 (Jan. 28, 2010), as amended on May 4, and November 3, 9, 17, 18 and 29, 2010, *available at* http://perma.cc/J6SB-GUBE.

[56] Complaint at 2, United States v. Comcast Corp., 808 F. Supp. 2d 145 (D.D.C. 2011) (No. 1:11-cv-00106).

[57] Comcast Corp., Gen. Elec. Co. and NBC Universal, 26 FCC Rcd. 4238 (2011).

[58] *Id.* at 4272.

[59] Complaint at ¶ 54, United States v. Comcast Corp., 808 F. Supp. 2d 145 (D.D.C. 2011) (No. 1:11-cv-00106).

munications service (see Table 2). Table 2 identifies a large number of competitive and public interest concerns with both the NBCU and the withdrawn Time Warner mergers, which, as shown by the citations to the NBCU merger consent decrees, were the foundation for the conditions that were imposed. Here we offer a few examples that highlight the threats to competition that would have been magnified by the proposed Time Warner merger.

Table 2 shows the market structure after the Comcast-NBCU merger. It shows the market share of Comcast in the key consumer access markets compared to the total market. These are national market shares; local market shares would be about twice as high. The national market shares are important in assessing the impact that the merger could have (i.e., the leverage that Comcast would possess) over vertically connected and complementary markets where, for example, reducing the available market for set top boxes could be a major barrier to competition.

As shown in Table 2, the Comcast-Time Warner merger would have dramatically increased the market power of the post-merger entity at the key points where competitors gain access to consumers (choke points). As the nation's largest MVPD and the nation's largest provider of broadband Internet access service, Comcast's large market share occurs at strategic chokepoints where competition is feeble at best. For example, as shown in the top line of the MVPD/Cable Market Structure and Harms section, Comcast's market share in the MVPD market was 23% after the NBC acquisition and 33% of the cable market. This would have increased to 35% and 50% respectively if the Time Warner merger had been allowed to go forward. As shown in the top line of the broadband market analysis, Comcast's market share would have gone from 33% to over 50%.

The increases in market power would have become tools that Comcast could have used to further undermine competition. For each of the two major product markets, the concerns that drove the regulatory agencies to impose conditions on the Comcast-NBCU merger were magnified significantly by the proposed Comcast-Time Warner merger (the entries below the market structure numbers). For example, the DOJ/FCC concluded that allowing Comcast to gain control over additional content that is deemed essential to the success of a distribution platform (known as "marquee" content), like access to sports programming, would give it the incentive and ability to exercise market power.[60] This would occur at the expense of competition, consumers, and the public interest in all the video content and distribution markets in which Comcast participates.

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[60] Comcast Corp., Gen. Elec. Co. and NBC Universal, 26 FCC Rcd. 4238, 4254, at ¶ 36 (2011). The record shows that the loss of access to Comcast-NBCU programming, including the programming contributed by NBCU, would harm rival video distributors, reducing their ability or incentive to compete with Comcast for subscribers. This is particularly true for marquee programming, which includes a broad portfolio of national cable programming in addition to regional sports networks (RSN) and local broadcast programming; such programming is important to Comcast's competitors and without good substitutes from other sources.

TABLE 2: COMPETITIVE CONCERNS AND INCREASED MARKET STRUCTURE IDENTIFIED IN THE COMCAST-NBCU MERGER THAT WERE SIMILAR CONCERNS IN THE COMCAST-TIME WARNER MERGER.

MVPD/Cable Market Structure and Harms

Identified Harms in Comcast/NBCU		*Similar Issues Raised in Comcast/TWC*
• MVPD share 23%, cable share 34% • Create vertical leverage, denial of access to consumers can hobble competition, increase market power (CI: 26, 28, 34) • Discriminatory access & dial placement (CI: 26, 28, 34) • Exclusion (FCC:13) • MFN cost problems (FCC: 24) • Perverse retransmission incentives (CI: 20) • Set top box abuse (FCC: 40) • Pay walls for OTA (FCC: 44)		• MVPD share 35%, cable share 50% • Increase in regional clustering & Comcast national reach with control of key media markets • Increase 33% in control of regional sports • Bloomberg delayed neighborhood • Tennis, Wealth Channels denied access • Rising prices, retransmission fees challenge pro-competitive claims • Increased scale places middle mile, set top box markets at greater risk of abuse of leverage

Broadband Market Structure and Harms

Identified Harms in Comcast/NBCU		*Similar Issues Raised in Comcast/TWC*
• Market share: 33% • OVDs are the best hope for competition (CI: 28) (CO: 5) • Nascent competition is vulnerable (CI: 21) • Harm to innovation is severe (CI: 36) (CO: 19) • OVD dependent on ISP for access to consumers (CI: 28) (CO: 17-18) • Incentive to harm OVD (FCC: 16, 31)		• Market share: over 50% • OVD discrimination: Netflix is the victim of discrimination, degradation (raising rivals' cost); Project Concord denied content • No increase in capital expenditure from merger • Rates, terms, and conditions fell short of conditions placed on merger • Paltry low-income program participation • Major increase in concentration: 50% increase in leverage challenges theory of conditions • Benchmarking becoming more difficult, losing the best "independent" entity • Reduced ability to measure and enforce behavioral remedies

General Competitive Concerns

Identified Harms in Comcast/NBCU		*Similar Issues Raised in Comcast/TWC*
• Enduring Domination (CO: 15) • Insufficient Competition (CI: 5; CO: 3-5) • Limited Entry (CI: 28) (CO: 5, 22) • Large local market shares (CO: 18) • Weak Competition (CI: 37) (CO: 3)		• Increasing dominance of cable over broadband: Verizon-Comcast joint venture, • Comcast sale of spectrum to telecommunication companies • Increasing concentration: Two failed attempts have not shaken industry hopes for a T-Mobile merger of some kind; ATT/Dish merger pending • Dominant firm/small fringe weakens competition • Coordination is facilitated by larger dominant firm • Larger footprint > greater ability/less risk to market power abuse

Sources: Dep't of Justice, Compl. [CO], Competitive Impact Statement [CI], United States v. Comcast Corp., 808 F. Supp. 2d 145 (D.D.C. 2011) (No. 1:11-cv-00106); Federal Communications Commission, Mem. Opinion and Order, Applications of Comcast Corp., General Electric Co. and NBC Universal, Inc. for Consent to Assign Licenses and Transfer Control of Licensees, 26 FCC Rcd. 4238, 4241 (2011) [FCC]; *Examining the Comcast-Time Warner Cable Merger: Hearing Before the S. Comm. on the Judiciary*, 113th Cong. 1–8 (2014) (statement of Gene Kimmelman, President and CEO, Public Knowledge), available at http://perma.cc/S4XR-WSPB; MARK COOPER, CONSUMER FED'N OF AM., BUYER AND BOTTLENECK MARKET POWER MAKE THE COMCAST-TIME WARNER MERGER "UNAPPROVABLE" (2014), *available at* http://perma.cc/W4ZM-C7Z9.

Table 2 also shows the general conditions in the video and broadband markets that reinforce the concerns about the abuse of market power. It shows that many of the underlying market structural conditions, aside from the Comcast-NBCU merger, failed to improve or deteriorated. It identifies Comcast behaviors under the NBCU consent decree that were troubling from the point of view of implementing remedies that seek to blunt Comcast's anticompetitive incentives by controlling the behaviors that would let it act on those incentives (i.e., behavioral remedies).

It is a gross understatement to say that the Comcast-Time Warner merger would have posed a much larger threat to competition and consumers. Comcast's dominance in broadband access, which already positions it as more than just the gatekeeper for online video innovation, would have been magnified dramatically by an acquisition of Time Warner Cable.[61] Any innovative new technology provider that relies on reliable, high-speed Internet access would be wary of doing anything that could expose it to retaliation by Comcast. Control of fifty percent of high-speed Internet subscribers would mean that Comcast's discrimination against any new service, like slowing down or blocking its content, or charging high costs to avoid such harmful treatment, could be the difference between its failure and success. As the FCC has recognized, had such discrimination occurred earlier, "some innovative edge providers that have today become major Internet businesses might not have been able to survive."[62]

If the merger had occurred, programming suppliers would be faced with Comcast and a fringe of smaller buyers, which would have given Comcast increased programming monopsony power—market power as a purchaser.[63] No program supplier would be able to obtain the critical mass of "eyeballs" necessary to successfully launch or sustain a program or channel without placement on the post-merger Comcast systems. This would enable Comcast to demand less than market prices for programming. Programmers would seek to make up lost revenues by increasing prices to other distributors, harming the ability of smaller distributors to compete and raising prices for consumers.

Monopsony power also gives Comcast enormous control over how independent programming is seen by subscribers. In the past, Comcast has exercised its influence to prevent independent programming such as HBO from being accessed on devices Comcast does not control, such as the Roku and Playstation 3.[64] In fact, no more than a week after the FCC voted on its

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[61] Based on long-standing economic theory, the *Merger Guidelines* measure market concentration with the HHI index, which takes the market share of each firm (expressed as a decimal), squares it and sums across all firms, and then multiplies by 10,000 to clear the fraction. W. KIP VISCUSI, JOHN M. VERNON & JOSEPH E. HARRINGTON, JR., ECONOMICS OF REGULATION AND ANTITRUST 147–149 (2001). The HHI can be shown to have a direct relationship to the Lerner Index, which measures the ability of firms to set prices above marginal cost. *Id.* at 258–59. The increase of market share from 35% to 50% would more than double the contribution to the HHI: $(.35)^2 = .1225 * 10{,}000 = 1225$; $(.5)^2 = .25 * 10{,}000 = 2500$.

[62] Preserving the Open Internet, 25 FCC Rcd. 17905, 17919, ¶ 23 (2010), *available at* http://perma.cc/7PC6-BPKH.

[63] In economics, monopsony is a market form in which only one buyer interfaces with would-be sellers of a particular product or products. A monopsony power assumes the monopsonist can dictate terms to its suppliers, as the only purchaser of a good or service, much in the same manner that a monopolist is said to control the market for many buyers as a sole seller in a given market. *See* SCHERER & ROSS, *supra* note 7, at 517.

[64] Karl Bode, *Comcast Still Blocking HBO Go on Roku (And Now Playstation 3), Incapable Of Explaining Why*, TECHDIRT (Mar. 7, 2014), https://perma.cc/DZH4-4NU3; Chris Welch, *Comcast Isn't Letting Customers Watch HBO Go on Playstation 3*, THE VERGE (Mar. 5, 2014), http://www.theverge.com/2014/3/5/5474850/comcast-isnt-letting-customers-watch-hbo-go-on-ps3, http://perma.cc/YU89-WDNM.

final 2015 Open Internet rules, news broke that Comcast was continuing to block HBO Go on the Playstation 4, citing vague technical difficulties, even though the application worked perfectly well on devices through other provider connections.[65] Post-merger, Comcast's monopsony power would have harmed consumers outside of its geographic footprint as well. After the merger, Comcast's infrastructure would have served almost sixty percent of all cable subscribers along with its large share of high-speed broadband customers. Given that monopsony power gives a company the ability to exercise significant control over demand in a market, Comcast would gain an enormous degree of leverage over equipment manufacturers, content providers, and in-home viewing options. If Comcast could deny or impede access to consumers, shrinking the potential market for suppliers of these goods and services, they would be less likely to successfully enter the market. Comcast would indirectly diminish the threat of competition in its service footprint by weakening competition generally. This would give Comcast an enormous degree of leverage over equipment manufacturers and standard setting organizations that establish the cost-effective business opportunities for offering cable and broadband customers new wireless, cloud storage, and in-home viewing options. No innovation in cable services or infrastructure could be adopted unless it was in Comcast's interest to do so.

In addition to being the nation's largest cable operator, Comcast also provides its rivals with programming by making one of the big three networks (NBC) available through retransmission consents and under the terms of the conditions of the Comcast-NBCU consent decree.[66] Post-merger, Comcast would have had an even greater incentive to increase the prices its rivals pay for that programming since doing so would give Comcast a competitive advantage in providing MVPD services. For example, recent economic analysis shows that the prices for regional sports channels owned by cable companies are higher than those charged by independent sports channels.[67] By increasing programming prices for competitors, Comcast can make its own pay-television service more attractive when compared to rivals.[68]

A merged Comcast and Time Warner Cable would have been positioned to act as the dominant gatekeeper for all types of online services. For an Internet service to reach Comcast's customers, at some point either its data network or a third-party network must interconnect with Comcast's net-

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[65] Chris Welch, *Surprise: Comcast Won't Let Anyone Watch HBO Go on Playstation 4*, THE VERGE (Mar. 5 2015), http://www.theverge.com/2015/3/5/8156025/comcast-blocks-hbo-go-sony-ps4, http://perma.cc/Q8YF-GC5R.

[66] Comcast Corp., Gen. Elec. Co. and NBC Universal, 26 FCC Rcd. 4238, 4254–55, at ¶ 37 (2011). "[T]he record evidence supports a finding that without Comcast-NBCU's suite of RSN, local and regional broadcast and national cable programming, other MVPDs likely would lose significant numbers of subscribers to Comcast, substantially harming those MVPDs that compete with Comcast in video distribution." *Id.* at 4254 (footnotes omitted).

[67] Kevin W. Caves, et al., *Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, REV. OF NETWORK ECON. 66 (2013).

[68] COOPER, UNAPPROVABLE, *supra* note 5, at 2–5.

work. However, after the merger, Comcast would have had increased means to use these interconnection relationships in an anticompetitive manner.[69] No matter how competitive the transit market may be, at some point all transit providers must face the reality that there is no way to reach Comcast's customers except through Comcast. The bigger the customer base, the greater the leverage Comcast has. Because of the size of the combined Comcast and Time Warner Cable's customer base, if Comcast decided to begin charging popular Internet services for access to its customer base, those large Internet services would have had no choice but to acquiesce.[70]

Furthermore, given the leverage Comcast has over Internet content and service companies, many of the same problems that manifest in the video space today could spread to the Internet market. If Internet service companies were forced to pay a toll to access Comcast's customers, they might have had to raise their prices, and the entire industry could suffer reduced investment. Similarly, popular Internet companies and content providers might have decided to offset interconnection fees paid to Comcast by charging smaller Internet service providers (ISPs) for interconnection.

The very strong parallels shown in Table 2 between the competitive concerns raised by the Comcast-NBCU merger and the Comcast-Time Warner merger make it clear that Comcast's claims that the latter would not have posed a problem are wrong. Comcast made exactly the same claims last time, and they were rejected. Comcast did not challenge the consent decree in court, so the findings are "law." Things have not greatly improved in the broadband Internet access service market.

The claim that the market is sufficiently competitive to allow the merger to take place is less true today than it was five years ago, and this merger would have posed a much bigger problem in that regard. The concerns are greater today because the FCC, in assessing the competitiveness of the market, has recognized that in the future true broadband service will require much higher speed[71]—twenty-five megabits upload and four megabits download—and there is very little if any competition to deliver that level of service. Only eight percent of consumers are served by two or more competitors with that capacity, and two is not enough to deliver workable competition.[72] From this forward-looking point of view, which is exactly the point of view the DOJ and FCC are required to take, the merger would

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[69] Indeed, there is some indication that it already has. *See, e.g.*, Reed Hastings, *Internet Trolls and the Case for Strong Net Neutrality*, NETFLIX BLOG (Mar. 20, 2014), http://perma.cc/AKX7-J43P; Comments of Level 3, FCC GN Docket No. 14-28 (Mar. 21, 2014), *available at* http://perma.cc/FBX2-BBM9. However, a merger would only increase Comcast's ability to demand interconnection fees that bear no relationship to actual network costs by substantially adding to its captive customer base.

[70] *See* Competitive Impact Statement § III.A.5, United States v. Comcast Corp., 808 F. Supp. 2d 145 (D.D.C. 2011) (No. 1:11-cv-00106).

[71] *See* Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, FCC 15-10, GN Docket No. 14-126 (2015), *available at* https://perma.cc/LH7Q-M6DF.

[72] *See* DAVID N. BEEDE, OFFICE OF THE CHIEF ECONOMIST, DEP'T OF COMMERCE, COMPETITION AMONG U.S. BROADBAND SERVICE PROVIDERS 1 (2014), http://perma.cc/RET6-9RVQ.

have constituted a marriage of the number one and number three firms in a market that is already highly concentrated, even by the recently revised Horizontal Merger Guidelines.[73]

The DOJ and FCC also rejected Comcast's claim that it does not have an incentive to discriminate against over-the-top-video providers. The conditions that Comcast agreed to as part of the consent decree rely on market transactions as benchmarks, but with a merged Comcast-Time Warner constituting such a large part of the market, it would be difficult—if not impossible—to implement those standards. Moreover, as shown in Table 2, Comcast's behavior under the consent decree leaves a great deal to be desired. It justifies the reluctance of antitrust authorities to use behavioral remedies. For example, it took Bloomberg TV roughly three years to enforce a straightforward merger condition,[74] only succeeding, perhaps not coincidentally, once Comcast decided to pursue its merger with Time Warner.

Happily, it appears that the DOJ and FCC agreed with this analysis. Indications from both agencies signaling they intended to oppose the deal led Comcast to announce on April 24th that it was abandoning the merger.[75] In a highly unusual move, *following* Comcast's withdrawal announcement, Attorney General Eric Holder went on record that he had authorized the DOJ to file a lawsuit challenging the merger.[76] Earlier in the same week, prior to Comcast's withdrawal announcement, news broke that FCC staff had recommended that the commission refer the transaction for review by an administrative law judge—usually the death knell in controversial deals like this one. Chairman Wheeler's statement mirrors our concerns: "Today, an online video market is emerging that offers new business models and greater consumer choice. The proposed merger would have posed an unacceptable risk to competition and innovation, especially given the growing importance of high-speed broadband to online video and innovative new services."[77]

IV. Network Neutrality and the Open Internet Rules

The market structure suggested by Table 2 provides a useful backdrop for the analysis of the network neutrality debate. Once a consumer connects to a network, all of the traffic going to that consumer flows over that network. As we have seen, few consumers have much choice in true broadband

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[73] *See* Dep't of Justice and Fed. Trade Comm'n, Horizontal Merger Guidelines 18–19 (2010), *available at* https://perma.cc/BD6M-A5GJ.

[74] Katy Bachman, *FCC Hands Bloomberg TV Big Win in Comcast Lineup Dispute*, AdWeek (Sept. 27, 2013), http://perma.cc/6587-F3T3.

[75] Devika Krishna Kumar, *Comcast drops Time Warner Cable bid after antitrust pressure*, Reuters (April 24, 2015), http://perma.cc/QZL3-LTQ2.

[76] Brett Kendall & Shalini Ramachandran, *Holder Had Authorized DOJ Lawsuit Against Comcast-Time Warner Deal*, Wall Street Journal (Apr. 24, 2015), http://www.wsj.com/articles/holder-had-authorized-doj-lawsuit-against-comcast-time-warner-deal-1429888983, http://perma.cc/BQ7K-4P6Y.

[77] Statement from FCC Chairman Tom Wheeler on the Comcast-Time Warner Cable Merger (Apr. 24, 2015), http://perma.cc/ZZ9T-WF2R.

service providers and even fewer choose to connect to two equal service providers at one time. Switching between broadband service providers can impose significant costs. This is sometimes called the terminating access monopoly.

Over the years since the passage of the 1996 Act and the offering of broadband Internet access service, it has become clear that these service providers have the power to completely control the flow of traffic to the customer. The Internet was born and flourished in the pre-broadband era (frequently referred to as the dialup era) under a regulatory regime that did not allow providers to exercise power in a discriminatory or anticompetitive manner. The network neutrality rules represent an effort to ensure that the nondiscriminatory access principle applies to broadband.

Thus, the current debate over Open Internet rules goes to the heart of the digital communications network and the broader digital economy. It captures the never-ending struggle to align law and technology in the communications sector. The FCC has issued its fourth set of rules governing high-speed Internet data transmission (broadband Internet access service) in a dozen years. The FCC has been reversed three times by federal courts of appeals,[78] and upheld once by the Supreme Court on account of traditional deference given to an agency's interpretation of its governing statute.[79] While the rules governing broadband have been unsettled since the passage of the 1996 Act (as shown in Table 3), in our view the remarkable success of thirty years of FCC policy in creating an environment in which the Internet could flourish is one of the best contemporary examples of the important role progressive policy should play to promote economic development and innovation.

TABLE 3: THE HISTORY OF A CLOSE CALL: THE REGULATORY AND JUDICIAL TREATMENT OF MASS-MARKET, HIGH-SPEED DATA TRANSMISSION SERVICE UNDER THE TELECOMMUNICATIONS ACT OF 1996

Year	Event	Implications for Current Classification Review
1998	Stevens Report	Ambiguous on classification
1998	Public interest groups petition for Title II classification	Need for nondiscrimination demonstrated

[78] Brand X Internet Servs. v. FCC, 345 F.3d 1120 (9th Cir. 2003) *rev'd and remanded sub nom.* Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967 (2005); Comcast Corp. v. FCC, 600 F.3d 642 (D.C. Cir. 2010); Verizon v. FCC, 740 F.3d 623 (D.C. Cir. 2014); *see also* AT&T Corp. v. City of Portland, 216 F.3d 871, 877–78 (9th Cir. 2000) (agreeing with the FCC view filed in an amicus brief that high speed data is not a cable service, but disagreeing with the FCC on whether it is a telecommunications service subject to Title II, finding that it is).

[79] Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 983 (2005).

2000	*Portland v. AT&T Cable*: 9th Circuit Court of Appeals finds cable a telecommunications service	Title II classification asserted: cable modem service involves telecommunications and is therefore subject to Title II
2000	FTC imposes commercial access condition on AOL-Time Warner	Concern about bottleneck provider expressed
2002	FCC issues Cable Modem Declaratory Order classifying cable modem service as an information (not telecommunications) service	Classified Information Service; Title I authority asserted; the need to address Communications Act principles affirmed
2003	*Brand X v. FCC* – 9th Circuit Court of Appeals affirms its *Portland v. AT&T* and overturns Cable Modem Order	Information Service rejected; telecommunications affirmed
2004	Chairman Powell declares Four Internet Freedoms	Importance of non-discrimination and consumer protection affirmed
2005	FCC uses Title II authority to investigate undue discrimination by Madison River	Importance of non-discrimination affirmed
2005	Supreme Court reverses 9th Circuit (6-3) on procedural grounds and upholds FCC information service classification	Information service upheld; Justices debate Title I authority
2005	FCC extends the Information service definition to mass market, high-speed data transmission services offered by telephone companies	Title I authority claimed; the need to address Communications Act principles affirmed
2005	FCC turns Four Internet Freedoms into a policy statement	Importance of non-discrimination and consumer protection affirmed
2006	AT&T agrees to network neutrality Bell South merger condition	Ability to distinguish service demonstrated
2007	FCC finds Comcast illegally discriminated against peer-to-peer applications	Need for non-discrimination affirmed; technical ability to offer separate services demonstrated
2010	Open Internet Proceeding initiated	Need for non-discrimination stated; Title I authority asserted
2010	National Broadband Plan	Importance of Communications Act principles affirmed; failure to achieve Communications Act goals documented
2010	D.C. Circuit Court overturns FCC action against Comcast	Title I authority questioned
2010	Broadband Internet Access Notice of Inquiry	Recognizes importance of all Communications Act principles; documents failure to achieve goals of the Act

A. The Dispute over Nondiscrimination in Communications Policy

To appreciate the stakes and the challenge, we need to briefly review how the current state of the debate came about. The principle that a nation's communications networks should provide access on a nondiscriminatory basis stretches back almost half a millennium to the principles of British common law.[80] The modern version of these principles was settled in law and antitrust rulings stretching back more than a century.

After the Telecommunications Act of 1996 was passed, those principles became unsettled by technological and legal developments, as summarized in Table 3. Prior to that time, the FCC's authority to require network operators to treat data flows in a nondiscriminatory manner was grounded in the ancillary authority doctrine, which allowed the Commission to impose common carrier obligations on non-common carriers when necessary to achieve the Act's broad purposes. Cable operators, who had never been subject to Title II, challenged the FCC's application of its ancillary authority to broadband, and the 1996 Act was unclear about how high-speed data should be classified.

In 1968, two landmark decisions laid the basis for the success of the Internet. The Carterfone decision allowed individuals to connect their own devices to the network and the Computer Inquiries ensured that data traffic would be handled in a nondiscriminatory manner.[81] The FCC did not directly assert Title II common carrier authority over data traffic, but it claimed to have ancillary authority under Title I to impose the obligation of nondiscrimination.[82]

The FCC, local governments, and interested parties have debated the proper regulation of the Internet for decades. In 1998, in the course of the FCC's review of a proposed merger between AT&T and Tele-Communications Inc., public interest groups asked the FCC to treat the Internet access service that cable operators had begun to sell to the public the same way that the Commission treated similar service offered by telephone companies.[83] When cable operators, whose video services are not regulated as telecommunications common carriers under Title II, offered the new data service, which clearly involved two-way telecommunications, the question arose as to how

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[80] ALAN STONE, PUBLIC SERVICE LIBERALISM 29 (1991).

[81] *See* TIM WU, THE MASTER SWITCH 190–91 (2010); François Bar, et al., *Defending the Internet Revolution in the Broadband Era: When Doing Nothing is Doing Harm* 10 (Berkeley Roundtable on the Int'l Econ., Working Paper No. 137, 1999), *available at* http://perma.cc/W95T-NUH8; Mark Cooper, *The Long History and Increasing Importance of Public Service Principles for 21st Century Digital Communications Networks*, 12 J. ON TELECOMM. & HIGH TECH. L. 1, 22–24 (2014).

[82] *See* Concerning High-Speed Access to the Internet Over Cable and Other Facilities, 17 FCC Rcd. 4798, 4841 (2002).

[83] *See* Consumers Union, Consumer Federation of America and Media Access Project, Motion to Vacate Stay of Enforcement of Horizontal Ownership Limits, FCC CS Docket No. 98-82 (Aug. 17, 1999), *available at* http://perma.cc/SNR2-X6SD.

the new service they were offering should be regulated.[84] The FCC did not take action, while local cable companies and local franchising authorities wrestled with the issue. Local cable franchising authorities tried to impose nondiscrimination obligations, but the cable operators resisted. The Ninth Circuit Court of Appeals was the first court to decide the issue—in a dispute between the City of Portland, Oregon and AT&T. The majority argued forcefully that Internet access service was a telecommunications service and should be subject to the nondiscrimination obligation:

> [T]he Telecommunications Act of 1996 enacted a competitive principle embodied by the dual duties of nondiscrimination and interconnection. . . . Under the Communications Act, this principle of telecommunication common carriage governs cable broadband as it does other means of Internet transmission such as telephone service and DSL, "regardless of the facilities used." The Internet's protocols themselves manifest a related principle called "end-to-end": control lies at the ends of the network where the users are, leaving a simple network that is neutral with respect to the data it transmits, like any common carrier. On this the role of the Internet, the codes of the legislator and the programmer agree.[85]

While the FTC ordered specific commercial access to Time Warner's post-merger system,[86] it did not (and could not) address the broader issue of nondiscriminatory access to the broadband network. The FCC, under Chairman Bill Kennard, took the matter up by issuing a Notice of Inquiry.[87] But two years later, under new-Chairman Michael Powell, the FCC ruled in the Cable Modem Order that because cable modem service bundled together telecommunications information service, under the 1996 Act it should be considered an information service, not a telecommunications service.[88] The Commission asserted that it could still exercise its ancillary authority to ensure non-discrimination, but it chose not to do so. Chairman Powell also declared his belief that cable operators should voluntarily adhere to four principles of Internet freedom, although these were not binding: "freedom to access content, freedom to use applications, freedom to attach personal devices, [and] freedom to obtain service plan information."[89] These consumer "freedoms" do not explicitly address the issue of discrimination, a core concern of communications policy.

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[84] *See* AT&T Corp. v. City of Portland, 216 F.3d 871, 879 (9th Cir. 2000).

[85] *Id.* (citations omitted).

[86] *See* FTC, *America Online, Inc., and Time Warner, Inc.*, (Nov. 22, 2002), https://perma.cc/JKG8-QC45.

[87] *See* High-Speed Access to the Internet Over Cable and Other Facilities, 15 FCC Rcd. 19,287 (2000).

[88] *See* High-Speed Access to the Internet Over Cable and Other Facilities, 17 FCC Rcd. 4798, 4802 (2002).

[89] Michael Powell, *Preserving Internet Freedom: Guiding Principles for the Industry*, 3 J. ON TELECOMM. & HIGH TECH. L. 5, 11–12 (2004).

The Ninth Circuit affirmed its earlier view and again ruled that the service should be classified as a telecommunications service, overturning the FCC order.[90] The FCC appealed and in the *Brand X* decision, on a split 6-3 vote, the Supreme Court reversed the Ninth Circuit order on procedural grounds. It concluded that the law was ambiguous on the classification and the Court had to give the expert agency deference under the *Chevron* doctrine.[91]

Soon thereafter, the FCC argued that since cable high-speed data was classified as an information service, telecommunications companies offering similar high-speed data service should be treated in the same way. Broadband Internet access service was not regulated under Title II, although slow speed, dialup service remained a telecommunications service. The FCC still claimed ancillary authority and raised Powell's four freedoms to the level of a policy statement in the Wireline Order,[92] which extended the classification of higher speed data transmission as an information service to similar services offered by telephone companies. But the FCC's ability to enforce a mere "policy" statement was still in question.

When Comcast was caught treating unaffiliated content delivered by a peer-to-peer technology offered by BitTorrent in a clearly discriminatory manner (they were inserting error messages in the flow of traffic to slow it down, which rendered it useless) the Commission ordered it to stop.[93] Comcast went to court. In the BitTorrent case, *Comcast v. FCC*, the D.C. Circuit sided with Comcast and ruled that the Commission could not prevent Comcast's blocking under the authority of the statute it had attempted to invoke in its action.[94] In the responding 2010 Open Internet rule, the FCC tried to write an order that would enable it to prevent discrimination under the D.C. Circuit's interpretation of the 1996 Act.[95] In early 2014, the D.C. Circuit overturned the FCC order, although it concluded that the FCC had authority to deal with discrimination under Section 706 of the Act.[96] While the most recent 2015 Open Internet Order published in response seeks to implement Section 706, as suggested by the court, its most striking feature is to reclassify broadband as a telecommunications service, in essence going back to the approach taken by the Ninth Circuit in its two rulings.

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[90] Brand X Internet Servs. v. FCC, 345 F.3d 1120, 1132 (9th Cir. 2003) *rev'd and remanded sub nom.* Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967 (2005).

[91] Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 997 (2005) (finding agency deference applicable under the framework of Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837 (1984)).

[92] Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities, et al., Policy Statement, 20 FCC Rcd. 14,986, 14,988 (2005).

[93] *See* Complaint of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications, 23 FCC Rcd. 13,028 (2008) (FCC Order).

[94] *See* Comcast Corp. v. FCC, 600 F.3d 642, 644 (D.C. Cir. 2010).

[95] Preserving the Open Internet, 25 FCC Rcd. 17,905 (2010).

[96] *See* Verizon v. FCC, 740 F.3d 623, 636 (D.C. Cir. 2014).

B. The Broad Framing of the Issue for the Digital Age

The analysis of the rules governing the treatment of traffic on digital communications networks must begin from the remarkable success of the rule the FCC adopted that produced the environment in which the Internet was created and thrived. The important role of regulatory policy in helping to create this success is clear. In the 2010 Open Internet order,[97] the FCC argued that the success of the digital revolution rests on a unique innovation system that created "virtuous cycles" of innovation and investment. The "virtuous cycle" framework posits that innovation and investment at the edge of the network is inextricably linked to innovation and investment in the communications network itself in a recursive, reinforcing feedback loop. Development of applications, devices, and content stimulates demand for communications that drives innovation and investment in the supply of communications network capacity and functionality. In turn, improving network functionalities and expanding capacity make new applications possible, which stimulate new demand, and the cycle is repeated. The challenge for the Commission is to develop a regulatory framework that protects and advances the "virtuous cycle," so that broadband deployment and adoption is stimulated. The network operators make a series of arguments against this conclusion that are similar to those made by Comcast in defense of its proposed mergers, i.e., that there is sufficient competition to prevent discrimination and that there is no incentive to engage in discrimination. These arguments have fared no better in the network neutrality context, as attested to in a 400-page order written by the FCC.[98]

The ability of network operators to flex their muscles at key choke points of broadband Internet access to deny access or condition access to the digital network, which was one of the key considerations in the antitrust analysis, has much broader implications in the virtuous cycle context. In fact, the FCC proceeding reminds us that the control of the choke point is a two-sided problem. Standing between the consumer and the content providers, broadband Internet access providers have the ability to impose discriminatory terms and conditions on even the largest content providers, such as Netflix.[99]

This makes Judge Silberman's dissent in the 2014 Open Internet ruling,[100] where he complained that the FCC had failed to demonstrate the presence of market power as the basis for a rule that seeks to "control" the market power of the network operators, an instructive starting point. Focus

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[97] *See* Preserving the Open Internet, 25 FCC Rcd. 17,905, 17,910–11 (2010).

[98] *See generally* Protecting and Promoting the Open Internet, 80 Fed. Reg. 19,738 (Apr. 13, 2015) (to be codified at 47 C.F.R. pts. 1, 8, & 20).

[99] *See* Comments of Netflix at 12, FCC GN Docket No. 14-28 (July 15, 2014), *available at* http://perma.cc/CSB8-A8KW.

[100] *See Verizon*, 740 F.3d at 664–65 (Silberman, J., concurring in part and dissenting in part).

on market power is the wrong way to think about the fundamental processes of the digital revolution.

Digital technologies and the dynamic economic process they support need to be viewed positively as providing unique mechanisms to overcome pervasive market barriers and imperfections that afflicted pre-digital industrial technologies and capture positive externalities that have eluded those technologies. The court majority recognized exactly what Judge Silberman missed: market power narrowly defined is not the only—or even the most important—potential threat to the "virtuous cycle."[101]

C. The Success of the Internet: What Makes the Internet an Engine for Democracy?

At the micro-level we can identify a number of conditions that created a space that was extremely friendly to entrepreneurial experimentation, which Shane Greenstein puts at the center of the success of the Internet innovation system.[102] Neutrality of the communications protocols and network devices meant that there was no need to engage in costly bilateral negotiation over the cost and quality of access. Openness and interoperability allowed entrepreneurs to experiment, and as such they were two essential features of a communications environment that fostered innovation at the edge.[103] User needs could not be signaled more readily, but users became active in innovating directly and indirectly.[104] With easy communications around open protocols and interfaces, complementary inputs created platforms in which many providers could specialize and collaborate to increase output and lower cost. The arrangement resulted in a dramatic reduction in transaction costs that created a powerful network effect. "Network neutrality" is a perfect description for a situation in which you do not have to "worry about" the insides of the network or negotiate to make agreements for transport of data through the network.

The Internet protocol itself, developed at the instigation and with the support of DARPA (the Defense Advanced Research Projects Agency), was managed as an open standard by the creators and users of the Internet through a collaborative, multi-stakeholder governance process. This internal organization, along with a major boost from the State, also prevented the incumbent telecommunications companies from hijacking the standard setting process.[105] Requiring the telecommunications companies to simply pass

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[101] *See id.* at 644–45 (majority opinion).

[102] *See* Shane Greenstein, *Innovative Conduct in Computing and Internet Markets*, *in* 1 HANDBOOKS IN ECONOMICS 478, 494–98 (2010).

[103] *See* Franco Malerba, Industrial Dynamics and Innovation: Progress and Challenges, Presidential Address at the 32nd Conference of the European Ass'n for Research in Indus. Econ., 12 (Sept. 1–4, 2005), http://perma.cc/SQ24-PAAN.

[104] *See* Greenstein, *supra* note 102, at 517; JANET ABBATE, INVENTING THE INTERNET 207–08 (2000).

[105] Wesley Cohen, *Fifty Years of Empirical Studies of Innovative Activity and Performance*, *in* 1 HANDBOOKS IN ECONOMICS 129, 172 (2010) ("[O]f all the sources of ideas for new

the data unimpeded from any device attached to the network by users and service innovators created the freedom to experiment in an environment that had been a tightly closed monopoly for the better part of a century.

The impact of the micro-level intended or directed activities described above was reinforced by undirected processes bringing about unintended consequences that magnified the positive impact. There were strong positive external economies associated with the emerging innovation system.[106] Platforms developed around open standards in which different firms collaborated and specialized in providing complementary inputs and products.[107] The diversity of specialized firms allowed a fine-grained division of labor to develop and also helped to keep the platform open, since there was a strong mutual interest in preventing any single firm from gaining control over a key input, which would give that firm the power to dictate the direction of innovation.

D. The Role of Public Policy

1. *Promoting Market Success*

Over the course of two decades, federal regulatory decisions created guaranteed open access to a communications space, but did not regulate activity within that space. The unfettered experimentation made possible by these decisions combined with the recognition of the need for an accessible standard to create a powerful network effect. Thus, FCC action embodies an enigma and resolves an inherent contradiction—sharp regulatory action is necessary to create a space for individual entrepreneurship, but regulatory restraint ensured freedom from regulation to conduct entrepreneurial experiments in that space.

Greenstein's analysis discussed above does not examine how the network neutrality that existed on the eve of the explosion of the commercial Internet and that was so vital to its success came into existence. Tim Wu (among many others) has identified a series of regulatory decisions that paved the way. The decision to allow any device to connect to the network with a simple jack meant every person could become an innovator. One such innovation was the modem, which was designed to integrate all data flow over the network. Simultaneously, the FCC ordered the telephone companies to allow that data to flow in a nondiscriminatory manner, a principle that had applied to voice communications for decades. Wu attests to the remarkable impact of these decisions:

R&D projects outside the R&D lab itself, including suppliers, rivals, university and government labs, or even a firm's own manufacturing operations, customers are far and away the most important.").

[106] *Id.* at 177–81.

[107] *See* Mark Cooper, *Making the Network Connection*, *in* OPEN ARCHITECTURE AS COMMUNICATIONS POLICY 95, 101 (Mark Cooper ed., 2004) (defining platforms and discussing several relevant examples).

> In short, with strange and unprecedented foresight, the FCC watered, fertilized, and cultivated online computer services as a special, protected industry, and, over the years, ordained a set of rules called the *Computer Inquiries*, a complex regime designed both to prevent AT&T from destroying any budding firms and also to ensure that online computer service flourished unregulated.[108]

François Bar notes that the FCC made a number of additional decisions that magnified the importance of the commitment to access to the core communications network and the decision not to regulate behavior in the data transmission area,[109] including access to the full functionality of raw data transmission service, which prevented the telephone companies from dictating the way the new data services would work. And the FCC also chose not to regulate Internet and data services. Bar concludes that: "Thanks to the FCC policy of 'openness' and competition, specialized networks and their users could unleash the Internet revolution. This assured the widest possible user choice and the greatest opportunities for users to interact with the myriad of emerging new entrants in all segments of the network."[110]

Greenstein acknowledges the role of the FCC in helping to create the conditions for the explosive growth of another communications protocol, Wi-Fi:

> More surprising, a wireless fidelity technology now popularly known as Wi-Fi became dominant. Wi-Fi did not arise from a single firm's innovative experiment. Rather, Wi-Fi began as something different that evolved through economic experiments at many firms. The evolution arose from the interplay of strategic behavior, coordinated action among designers, deliberate investment strategies, learning externalities across firms, and a measure of simple and plain good fortune . . . . Federal spectrum policy cooperated with these technical initiatives—indeed, nothing would have succeeded in its absence . . . .[111]

There were a host of other widely recognized ways in which the public policy supported the development of the digital techno-economic paradigm. These included:

- large, sustained financial support for basic research, development, and initial deployment of key technologies;
- a commitment to develop decentralized communications networks for strategic defense in the 1960s, with a request and fund-

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[108] Wu, *supra* note 81, at 191.
[109] *See* Bar, *supra* note 81, at 2.
[110] *Id.*
[111] Shane Greenstein, *Economic Experiments and Neutrality in Internet Access* 12–14 (Nat'l Bureau of Econ. Research, Working Paper No. 13158, 2007), http://perma.cc/4LDM-3MU2.

ing from the Department of Defense to develop the Internet Protocols and the development of a browser;[112]
- the role of a quasi-governmental agency in the early years in the management of the network of networks, while norms were being developed;
- a significant market in the public sector;
- a long-standing New Deal tradition of pricing to promote use (that is, bill-and-keep for interconnecting communications companies and flat rate pricing for end users).

Thus, the "virtuous cycle," drawing on the positive externalities created by an environment in which information flowed freely, was a powerful unintended consequence of the interaction of progressive policy and entrepreneurial experiments that defined a new market structure that encouraged entry by many new firms, which resulted in greater specialization, more collaboration, and less concentration.

2. *Preventing Market Failures*

While broad government policies promoted the success of the digital revolution, specific FCC policies prevent negative behaviors from undermining its chances for success in the communications sector. To begin the analysis, we describe the nature of the network owners. They are the large, bureaucratically organized incumbents that dominated the twentieth century communications networks in both voice and video, e.g., AT&T, Verizon, Comcast, and Time Warner. Given their location and importance in the digital communications platform, they are likely to do significant harm to the freedom of entrepreneurial experimentation at the edge of the network that is the driving force in the "virtuous cycle" if they are left unregulated to pursue their interests. They could do so by trying to "tax" innovators by raising their cost of access to consumers or by slowing service that might compete with a similar offering of their own.

Their actions can dampen the willingness and ability of the edge to experiment, imposing counterproductive "worry" about the network and its devices, increasing costs substantially by forcing edge entrepreneurs to engage in bilateral negotiation, undermining interoperability, and chilling innovation through the threat of "hold up" of successful edge activities.

As incumbents, they have a conservative, myopic bias to protect their position, and are certain to be far less innovative and dynamic than the edge based on a preference for preserving the old structure, a pursuit of incremental process innovation rather than radical product innovation, and proprietary culture that prefers restrictions on the flow of knowledge. Competition is much weaker in the network segment of the digital platform than in the edge segments because of large economies of scale and barriers to entry, which

[112] *See* Greenstein, *supra* note 102, at 507–08.

means network owners face less pressure to innovate, have the ability to influence industrial structure to favor their interests at the expense of the public interest, can use vertical leverage (where they are integrated) to gain competitive advantage over independent edge entrepreneurs, and have the ability to extract rents, where they possess market power or where switching costs are high.

That many of these concerns are forward-looking should not be surprising, since it is the opportunity to experiment (in the face of the unpredictability of success and failure) that is the most valuable trait of the Internet innovation system. The Communications Act is very much a forward-looking statute, regulating behavior to achieve goals and prevent harms, rather than correcting harms after the fact.

At the same time, the network operators have given strong indication that they have the incentive and ability to engage in antisocial conduct. In less than a decade after Chairman Powell declared the four freedoms and Chairman Martin turned them into an official policy with questionable enforcement, we have more than a dozen examples of services that compete with the franchise offerings of network owners, and voice and video are singled out for discriminatory treatment (see Table 4).[113]

The most recent FCC Open Internet Order moves more aggressively to deter these behaviors. Under the Open Internet Order, paid prioritization (an explicit form of raising rivals' costs) is banned.[114] While there is a bright line against blocking and throttling subject to a "reasonable network" management test, discrimination would be assessed under the broader reasonable network practices standard.[115]

Repeated, persistent attacks like this may seem small, but they took place after the cable modem order articulation of principles and policies about network neutrality and Internet freedom, and they can easily impose costs and chill innovation. The earlier rounds of debate in the period before the cable modem order revealed behaviors that would be devastating to innovation and competition because they made it clear to those seeking access that the telephone companies would not allow them to innovate in ways that might threaten their position as gatekeepers.[116] While many of these actions could trigger antitrust concerns, neither the Sherman Act nor the Clayton

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[113] *See* Mark Cooper, Dir. of Research, Consumer Fed'n of Am., The Digital Past as Prologue: How a Combination of Public Policy and Private Investment Produced the Crowning Achievement (to Date) of Progressive (American) Capitalism, Address at AEI/University of Nebraska Forum (Sept. 10, 2014), https://perma.cc/4YZ8-X267.

[114] Protecting and Promoting the Open Internet, 80 Fed. Reg. 19,738, 19,740 at ¶ 18 (Apr. 13, 2015) (to be codified at 47 C.F.R. pts. 1, 8, & 20).

[115] *Id.* at ¶¶ 15–16, 18, 21.

[116] *See* Mark Cooper, *Anticompetitive Problems of Closed Communications Facilities*, *in* OPEN ARCHITECTURE AS COMMUNICATIONS POLICY 155, 168–69 (Mark Cooper ed., 2004) (citing NORTHNET, INC., AN OPEN ACCESS BUSINESS MODEL FOR CABLE SYSTEMS: PROMOTING COMPETITION AND PRESERVING INTERNET INNOVATION ON A SHARED, BROADBAND COMMUNICATIONS NETWORK 6–7 (2004)).

Antitrust Act is well-suited to tackle the balancing of social and economic factors that impact the "virtuous cycle."

TABLE 4: VIOLATION OF NETWORK NEUTRALITY AFTER THE CABLE MODEM ORDER

Blocking—Preventing consumers from getting what they have paid for:
- Madison River blocking VoIP ports (2005)[a]
- Cingular's blocking of PayPal (2006)[b]
- AT&T blocking of Slingbox iPhone application (2010)[c]
- Skype blocking on mobile networks (2010)[d]
- FaceTime blocking over mobile devices unless using Mobile Share plan (2012)[e]
- Verizon blocking access to tethering apps (2012)[f]

Throttling—Degrading or impairing the flow of content:
- Comcast degrading BitTorrent Traffic (2007)[g]
- Netflix degradation on Comcast (2013–2014)[h]
- Comcast refusal to connect Netflix CDN (2013)[i]

Discrimination—Giving preferential treatment to selected (owned or affiliated) services:
- Comcast exemption of Xfinity online video app on Xbox and TiVo from data caps (2012)[j]
- AT&T-sponsored data plan on wireless network (2014)[k]
- T-Mobile "Music Freedom" exemption of popular music streaming sites from data caps (2014)[l]

Raising rivals' costs—Directly favoring some content or specific providers by raising the cost of others:
- Comcast/Verizon interconnection agreements with Netflix (2014)[m]
- Continuing problems with wireless data roaming (2010–2014)[n]

Sources: Practices defined and regulated in Protecting and Promoting the Open Internet, 80 Fed. Reg. 19,738, 19,740 at ¶ 18 (Apr. 13, 2015) (to be codified at 47 C.F.R. pts. 1, 8, & 20). Individual examples described in:

[a] Madison River Communications, 20 FCC Rcd. 4295, 4297 (2005).

[b] Debi Jones, *Cingular Slams the Door on PayPal Competition*, MOBILE JONES (July 7, 2006), http://perma.cc/X5V9-25QP.

[c] Press Release, FreePress, Save the Internet, AT&T Finally Opts to Lift Arbitrary Sling-Player Ban on iPhone (Feb. 4, 2010), *available at* http://perma.cc/PJ6H-CNHE.

[d] Ryan Singel, *Apply Net Neutrality to Skype on Smartphones, Group Asks Feds*, WIRED (Apr. 3, 2009), http://perma.cc/EMC6-7S3A.

[e] John Bergmayer, *Holding AT&T to Account for Blocking FaceTime on iPhones and iPads*, PUBLIC KNOWLEDGE (Sept. 18, 2012), http://perma.cc/C4RQ-TF84.

[f] Jerry Hildenbrand, *Verizon and AT&T Blocking Tethering Apps from the Android Market*, ANDROID CENTRAL (May 2, 2011, 4:57 PM), http://perma.cc/RVZ5-HGFJ.

[g] Compl. of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications, 23 FCC Rcd. 13028 (2008) (FCC Order).

[h] Jon Brodkin, *Netflix Performance on Verizon and Comcast Has Been Dropping for Months*, ARS TECHNICA (Feb. 10, 2014, 4:30 PM), http://perma.cc/CJR2-S47T.

[i] Pet. to Enforce Merger Conditions, Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses and Transfer Control of Licenses, MB No. 10-56, Aug. 1, 2012, *available at* http://perma.cc/33HB-A68G.

[j] Haley Sweetland Edwards, *Verizon, Netflix Spar in Epic Battle Over Who Should Pay for What*, TIME (June 12, 2014), http://perma.cc/MLQ4-73EL.

[k] David Kravets, *AT&T Thumbs Nose at Net Neutrality With 'Sponsored' Bandwidth Scheme*, WIRED (Jan. 6, 2014, 3:42 PM), http://perma.cc/X3YB-WXMV.

[l] Michael Weinberg, *T-Mobile Uses Data Caps to Manipulate Competition Online, Undermine Net Neutrality*, PUBLIC KNOWLEDGE (June 19, 2014), http://perma.cc/AQQ4-RCDU.

[m] Zachary M. Seward, *The Inside Story of How Netflix Came to Pay Comcast for Internet Traffic*, QUARTZ (Aug. 27, 2014), http://perma.cc/7AMR-QF83; Sam Gustin, *Netflix Pays Verizon in Streaming Deal, Following Comcast Pact*, TIME (Apr. 28, 2014), http://perma.cc/A88A-XHBT.

[n] Phil Goldstein, *Sprint Takes T-Mobile's Side in Data Roaming Dispute with AT&T, Verizon*, FIERCE WIRELESS (Aug. 22, 2014), http://perma.cc/CP9B-9SSP.

V. PAST PRACTICES AND FUTURE CHALLENGES

These two case studies show that the complex and successful interaction between antitrust and economic regulation has become more important to the success of the digital communications market, not only because of the growing importance of communications, but also because of the increasing complexity in the complementary and vertical relationships that typify digital markets. The concept of platforms, frequently applied in the digital economy, underscores the importance of the interconnected markets.[117] A platform is an "arrangement of components and activities, usually defined by a set of technical standards and procedural norms around which users organize their activities . . . and are usually open in some sense."[118]

While antitrust enforcement has been and can be effective at addressing some of the concerns raised by Comcast's recent expansion, it is not enough to prevent the dangers to a socially and economically healthy Internet ecosystem that the FCC is able to tackle. Nor can antitrust intervene directly to promote more diversity of voices or expand market choices the way the FCC can. Even a competitive market may not provide the opportunity for important, but minority, points of view to be represented because they are not profitable. By conditioning the previous Comcast-NBCU transaction, the FCC applied existing oversight tools to prevent discrimination against independent programmers and harm to existing video competitors. The DOJ and FCC also established new obligations for Comcast to treat Online Video Distributors (OVDs) in the same manner as similarly situated video distributors and studios treat such OVDs.[119] Both agencies also applied existing net-

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[117] *See* Cooper, *supra* note 107, at 97, 100–01.

[118] Shane Greenstein, *The Evolving Structure of Commercial Internet Markets*, *in* UNDERSTANDING THE DIGITAL ECONOMY 151, 154 (Erik Brynjolfsson & Brian Kahin eds., 2002).

[119] *See* Comcast Corp., General Electric Co. and NBC Universal, Inc., 26 FCC Rcd. 4238, 4241 (2011).

work neutrality rules (since then, such rules were overturned by the D.C. Circuit Court of Appeals) to Comcast's broadband transmission offerings.[120]

A. *The Continuing Commitment to and Expansion of Progressive Goals for Communications Policy*

While antitrust struggles with preserving competition in a market structure that tends toward small numbers of large players and relies on very strong vertical and complementary ties to platforms, the progressive thrust of regulatory policy has continued and strengthened. Building on the universal service language of the 1934 Act, the Telecommunications Act of 1996 reinforced both the progressive and pragmatic thrusts of universal service policy:

> Quality services should be available at just, reasonable, and affordable rates . . . . Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas (§254) . . . . A provider of telecommunications service shall ensure that the service is accessible to and usable by individuals with disabilities, if readily available (§255).[121]

This statutory provision is clearly pragmatically progressive. It uses terms like reasonable and affordable. The comparability between rural and urban recognizes that the costs of serving rural areas are high, but declares the goal of comparability of service and rates nonetheless. The level of service is expected to evolve as technology advances. Other important public purposes are specified, including education, health, and safety. The spread of technology through market processes is a touchstone for triggering the obligation to treat services as covered by the universal service goals.

The process for defining those services eligible for support is consultative between the FCC and the Joint Board, which is made up of state regulators.[122] The role of state regulation has contemporary and historical significance. State regulators have traditionally been responsible for overseeing the recovery of the vast majority of the costs of the telephone network, although the classification of broadband as an interstate service is changing that. Key network inputs, like rights of way to lay fiber or build towers, are

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[120] *See id.* at 4247.

[121] 47 U.S.C. §§ 254, 255 (2012).

[122] *See* FCC, *Federal-State Joint Board on Universal Service*, http://perma.cc/B58R-NXND.

still state and local issues, which have become contentious,[123] and the state and local levels were the origin of the early development of utility regulation and progressive policy.[124]

This thrust toward progressive policy did not stop with the 1996 Act. A little over a decade later, Congress revisited these issues in light of the fact that the 1996 Act and the classification of broadband as an information service did not seem to be working. While a decade may not seem like a long time in communications policy, it is an eternity in the digital age.

The Broadband Data Improvement Act[125] listed a series of findings about the impact of broadband, which was the motivation to improve the quality and frequency of the FCC's analysis of broadband deployment under Section 706. The following year, Congress authorized funds to develop programs to accelerate the deployment and use of broadband in the American Recovery and Reinvestment Act's Broadband Technology Opportunities Program.[126] It charged the FCC with developing a National Broadband Plan. The substantive issues to be included reflected the earlier findings of the Broadband Data Improvement Act and directed the FCC to identify effective mechanisms for ensuring access to broadband. It emphasized new aspects of the universal service challenge by charging the FCC with developing a strategy "for achieving affordability of such service and maximum utilization of broadband" and linked this to "a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes."[127]

The issues that were raised by these two Acts are at the heart of the "virtuous cycle" and go well beyond the twentieth century approach to universal service. Availability of service is a small part of universal service in the digital age; adoption and utilization are much more important.[128] The provisions ordered the FCC to develop a National Broadband Plan with no finding of untimely or unreasonable deployment. The cost of broadband is much higher than plain old telephone service and the service it delivers is much more complex, requiring both an appreciation of its greater value and the skill to utilize it. Getting people to adopt the service involves a lot more than making it available and lowering the price a little.

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[123] *See, e.g.*, City of Wilson, 2015 WL 1120113 (FCC March 12, 2015).

[124] *See* STONE, *supra* note 80, at 158–60 (1991).

[125] *See* 47 U.S.C. § 1301 (2012).

[126] *See Broadband USA*, DEP'T OF COMM. NAT'L TELECOMM & INFO. ADMIN., http://perma.cc/SUL7-58QF.

[127] 47 U.S.C. § 1305 (2012)

[128] *See* Mark Cooper, *Inequality in the Digital Society: Why the Digital Divide Deserves All the Attentions It Gets*, 20 CARDOZO ARTS & ENT. L.J. 73, 111 (2002).

Society cannot sit idle and wait for people to adopt broadband because of the massive benefits associated with broadband adoption.[129] Indeed, one can argue that more than a decade after the Cable Modem Order, the fact that almost one-third of U.S. households do not have broadband service indicates that the *laissez-faire* approach adopted by the Bush administration in the Cable Modem and Wireline Broadband Orders failed to further the first goal of the Communications Act.[130]

The fact that in one of his first speeches in 2015, President Obama declared that high-speed broadband service has become essential to American society, illustrates the importance of policy to the digital age. Without even considering policies to promote education, training, improved health care, or other public investments beyond the scope of this article, the idea that high-speed broadband is essential highlights a number of antitrust and FCC policy issues.

Since about sixteen percent of U.S. households either cannot afford or cannot understand how to use the Internet,[131] we need to expand the current subsidy system that makes telephones affordable to low-income, marginalized families and rural households to cover high-speed broadband. In the same way that consumers have been protected against privacy incursions and abusive marketing practices for essential telephone services, we need the FCC to provide similar protections for essential broadband services.

While time will tell whether the Comcast-NBCU restrictions achieved their purpose, what the DOJ could not do and FCC did not do in that case was seek to expand the OVD market and increase competitive options for consumers. Now that the Comcast-Time Warner merger is withdrawn following DOJ and FTC scrutiny, the agencies may potentially accomplish much more. Not only does rejection of this transaction prevent the same harms the agencies expressed concerns about in the previous Comcast-NBCU deal, but it also provides breathing room for incipient OVD competition to explode. In the proposed Comcast-Time Warner deal there had been no conditions to protect against Comcast's myriad tools to stifle competition and innovation. Ultimately, the DOJ and FCC came to the right conclusion because there would have been no way to address the competitive concerns raised by merger.

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[129] Congress went beyond the traditional statement of the universal availability of service to stress broadband adoption in the Broadband Technology Opportunities Program, 42 U.S.C. § 1305 (2012), enacted as part of The American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 512 (codified in scattered sections of U.S.C.). Michael Powell rejected this notion in his first press conference as FCC Chairman, belittling the digital divide by declaring "I think there is a 'Mercedes Benz divide.' I'd like one, but I can't afford it." Michael Powell, Chairman, FCC, Press Conference (Feb. 8, 2001).

[130] *See Three Technology Revolutions*, PEW RESEARCH CTR., http://perma.cc/J4BG-5CT2; Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, 2015 WL 477865 (FCC Feb. 4, 2015).

[131] *See* Kathryn Zickuhr, *Who's Not Online and Why*, PEW RESEARCH CTR. (Sept. 25, 2013), http://perma.cc/YD75-EQAY.

More importantly, as the Internet increasingly becomes an essential highway for the marketplace of ideas that fuels our democracy, we need to ensure that no Internet service provider is positioned unfairly to tip the balance of the information flow that informs the citizenry and enables freedom of expression. Given the economics of Internet connectivity (as described above in Part II), the few providers who serve consumers will most likely have the economic opportunity and incentive to favor some Internet content over other content. Therefore, the FCC's most recent Open Internet rules, backed by antitrust enforcement, not only deter extreme anti-competitive behavior but are also essential to protect critical elements of information flow in a democracy.

B. General Challenges for Antitrust and Economic Regulation in the Digital Era

In the wake of a predominantly deregulatory decade for telecommunications, the failure of the Comcast-Time Warner merger represents a success of the antitrust/regulatory system. Combined with the network neutrality decision, the rejection of the merger articulates an important direction of policy for antitrust and regulation in the digital economy. Platforms will inevitably be few in number in the digital age, resulting in concentrated choke points (essential facilities in an earlier age), because of the large and powerful economies of scale and scope of distribution and information gathering. In a sense, this has always been the case with communications infrastructure, but digital technology raised the hope (misplaced it would appear) that competition for infrastructure would be workable. Unfortunately, competition between platforms is not likely to be enough to achieve the outcome we associate with workable competition, although we should never give up hope or abandon efforts to promote such competition, so competition on the platform is crucial.

Thus, one primary goal of public policy in a dynamic digital economy is to ensure that the market power that is inherent in the platforms does not hinder or diminish the competition for goods, services and applications that can flow on the platform. We have the model in hand, bright lines behind which entrepreneurial experimentation is unleashed, and strong antitrust principles to constrain market power.

What antitrust can do is prevent monopolization, collusion, and cartel behavior and block transactions that may significantly impede competition. This is an essential first step to preventing market dominance and failure.

What antitrust most often cannot do is directly expand competition (it cannot even break open a monopoly unless there is behavior to prevent efforts to compete) or promote/support other policies that protect consumers (directly promote privacy, diversity, and choice). This is where we need regulation working in tandem with strong antitrust enforcement. Antitrust could not take cable from monopoly to competitive market, but "access to programming" could jump-start satellite competition to cable.

Unlike cable and telecommunications firms, some of the emerging platforms that could cause consumer harm even if broadband distribution is subject to strong antitrust enforcement and FCC oversight, such as Facebook, Amazon, and Google, are currently not subject to dual review. Will antitrust be adequate to police against the most dangerous harms that may arise? Will it be nimble enough to intervene early, before massive harm is caused? While we do not see a massive problem today, there are danger signs that these types of platforms could tip toward substantial market dominance, and it may be necessary to consider what tools—alongside antitrust enforcement—will be needed to address consumers' needs.

At least for broadband, telecommunications, and cable, we have FCC oversight through the Communications Act and transaction reviews for license transfers that enable dual competitive analysis with antitrust agencies. If done effectively, these parallel and complementary oversight and law enforcement processes should prevent excessive industry consolidation, abuse of market power, and unreasonable discrimination. They should also promote affordable access to essential communications platforms that secure our democracy and protect freedom of expression for all individuals.

Both antitrust and regulation are grappling with the economic characteristics of the digital communications sector, including small numbers in winner-take-most markets that exhibit strong complementarities and vertical relations in platforms. These challenges call for the continued evolution of antitrust and regulation, not their abandonment. Competition and public interest principles still have an important role to play in guiding communications markets. Antitrust can maximize the number of competitors and move swiftly against artificial barriers to entry or anticompetitive vertical leverage. The FCC is charged with the central goals of communications policy: achieving universal service, which involves ensuring deployment and adoption of broadband, protecting consumers, and reviewing mergers with an eye toward promoting competition and the public interest. The recent pressures applied to convince Comcast to abandon its proposed merger with Time Warner provide a new high water mark for forward-looking enforcement of antitrust and the Communications Act. Only this combined market oversight, applied on an ongoing basis, will be adequate to ensure digital communications platforms capable of promoting social and economic justice necessary to support a robust democracy.

April 21, 2021

The Honorable Dick Durbin
United States Senate
711 Hart Senate Office Building
Washington, D.C. 20510

The Honorable Chuck Grassley
United States Senate
135 Hart Senate Office Building
Washington, D.C. 20510

The Honorable Amy Klobuchar
United States Senate
425 Dirksen Senate Office Building
Washington, D.C. 20510

The Honorable Mike Lee
United States Senate
361A Russell Senate Office Building
Washington, D.C. 20510

DEVELOPERS ALLIANCE

Founded in January 2012, the Developers Alliance is a global industry association that supports software developers as entrepreneurs, innovators, and creators.

DevelopersAlliance.org

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Re: Subcommittee on Competition Policy, Antitrust, and Consumer Rights Hearing on "Antitrust Applied: Examining Competition in App Stores"

Dear Chairman Durbin, Ranking Member Grassley, Chairwoman Klobuchar, and Ranking Member Lee,

We write to express the views of software developers with regards to the hearing examining competition in app stores. The Developers Alliance represents over 70,000 developers from 50 states and many countries including the EU, UK, Canada and Australia, and has advocated for software developers for almost a decade. Our members seek to ensure a thriving app ecosystem that allows developers to profitably reach consumers around the world. An accurate picture of how developers are impacted by the app store ecosystem is necessary to establish policy that encourages competition and sector growth. While developers and app stores don't always agree, the existing system functions well and has been central to the success of developers and their ability to scale and reach new markets. Simply put, developers are not asking for legislative help.

Like businesses in general, developer-led companies are all unique. Policy should not be dictated by one or two large companies that have expressed grievances because they did not find the terms of service that they agreed to with an app store favorable for their company's needs. In our many conversations, and in our April 2021 survey of developers across the US, EU, and Australia, developers overwhelmingly say that large platform companies running app stores have a right to enforce the terms of service they set forth. App stores set these terms of service so that bad actor apps do not ruin their ecosystem with bad or faulty products, harming good developer's products as well as the billions of consumers who rely on app stores every day.

App stores provide developers with the critical resources needed for their success. Nearly half of developers in the United States specifically find the technical information, SDKs and tools that app stores provide extremely important to their success. Further, many developers believe that the presence of these large companies encourages stability within the larger ecosystem. This is even more prominent if the developer-led company receiving the benefits is small. App stores and the ecosystem around them allows for small businesses' products to reach billions of potential customers, while the developers and companies themselves focus their work on harnessing software to build better lives, unburdening them from secondary activities such as setting up

systems to collect and remit sales taxes, establishing fraud-proof payment systems, scanning their network for malware, protecting customer data, and managing engagement with users.

Legislators in multiple states that have been looking to regulate app store payment methods and fees are working on the false assumption that developers are seeking a free ride. When polled, over 80% of developers believe that their company should pay for services that platform companies provide. This proves that developers acknowledge that it costs platforms to run their programs and app stores and offer developers these resources. While there is agreement that developers should pay platforms something for using the app stores, there is decidedly no consensus on what the appropriate cost to developers should be based on. This can likely be explained by apps having different means of revenue and payment structures depending on the nature of their product or service. With apps, one size does not fit all.

App stores have been working with developer groups to make modifications to their current pay structure in an effort to bring equity to the grievances brought by small developer-led businesses. With new initiatives that have recently gone into place, 99% of developers saw a 50% reduction in their app store fees. Developers that face larger fees for in-app purchases and downloads do so because they are within the 1% of successful companies. There is the belief amongst the developer community that larger successful developers that can bear that burden should do so to encourage a competitive ecosystem. This shows the ability of the market to adjust and come up with an industry-based solution. Regulation of app stores on behalf of developers portrays our members as victims in a system of economic abuse. We fear that the rhetoric of "fighting for the little guy" is being used to advance the interests of a lobby that is neither small nor without its own influence. While we cheer the adversarial spirit that makes the software sector such a dynamic and innovative space, we are disappointed when our community is used to justify market-distorting regulation in place of fair competition between large, successful companies.

We appreciate the Subcommittee's interest in creating a policy that encourages competition and on the face supports developers, however, developers themselves have made it clear to us that they believe a market-based solution is the only welcome solution, and that legislative intervention would cause more harm than good. While they believe that every system has room for improvement, policing app stores will not lead to favorable market outcomes for consumers or industry. Like any sector, developers cheer on and push for lower business fees and would like their professional grievances heard and dealt with in a timely manner. This does not make them unique or require special legislation. More than two-thirds of developers have a positive outlook for financial success, with just as many seeing stability or an increase in their finances in recent years. App stores provide a trusted brand, useful developer tools and services, and a safe place for consumers to find new apps. The Developers Alliance appreciates the opportunity to engage with you on this important topic and we look forward to working with policymakers to identify market-based solutions for the developer community.

Sincerely,

Bruce Gustafson
President & CEO
Developers Alliance

Sarah Richard
Policy Counsel & Head of US Policy
Developers Alliance

Founded in January 2012, the Developers Alliance is a global industry association that supports software developers as entrepreneurs, innovators, and creators.

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OPINION

Is your iPhone worth China's tyranny?

By Clyde Prestowitz

April 18, 2021 | 9:13pm | Updated

Tim Cook and Apple have championed liberal values and minority rights in the West.
Eric Thayer/Getty Images

To understand the troubled relationship between America and Communist China, it helps to tell the story of two Apples.

The first story begins on a fishing boat, where a 12-year-old boy named Jimmy Lai hid as a stowaway to reach Hong Kong from Guangzhou, China, in 1951.

Beginning as a child laborer earning $8 a month, Lai became fluent in English, founded a garment empire called Giordano, then established a publishing giant that includes Hong Kong's largest independent newspaper, The Apple. A staunch defender of free speech and democracy, Lai is now in jail, facing a likely life sentence on trumped-up charges.

The second Apple is the company that probably manufactured your smartphone. Tim Cook, the tech giant's current CEO, was born in Alabama in 1960. After earning a master's degree in business from Duke, he joined Apple as vice president for worldwide operations in 1998 — and quickly began planning to shift the company's production operations to locations near Guangzhou, Jimmy Lai's birthplace.

As a result, Apple shed labor unions, US wages and strict environmental and safety regulations while winning investment subsidies from China. In the bargain, Cook became one of the world's richest men, wielding enormous political influence. Yet the American Apple's entanglement with China would soon work to the detriment of the other, pro-democracy Apple.

In fall 2019, massive demonstrations broke out in Hong Kong in support of rule of law and against the extradition of citizens to mainland China.

Apple newspaper owner Lai was among the demonstrators. Apple, the US tech giant, had an app in its store that helped dissidents by showing where they and the police were in real time.

This drove the Communist bosses in Beijing crazy. They called on obedient mainland news publications to call for the app's deletion from Apple's store. Cook's Apple got the message — and did just that.

Worse, Cook's firm said it had done so voluntarily, when everyone knew that, with all its production capacity located in China, Apple was scared of what would happen if it didn't comply. The world learned how much of a hostage Apple Corp. really is to the Chinese Communist Party.

Cook and his Apple loudly tout liberal values and minority rights in the West. But when it comes to China's imprisonment of a million Uighurs in concentration camps, the repression of Tibet, the killing of Hong Kong's free society and the stifling of international probes into the origins of the novel coronavirus, Cook's Apple keeps curiously mum.

The silence is damning. And it mirrors the corrupt bargain the West has struck with the Chinese Communist Party, which is open about its hostility to our values.

SEE ALSO

Siri leaks date of next Apple event — and it's just around the corner

In Article Nine of the resolutions of the Communist Party's Congress in 2013, dealing with the "ideological sphere," China's leaders told the world exactly how they felt. They declared complete opposition to Western values, to constitutional democracy and to the Western understandings of universal human values, freedom of the press, human rights and civil society.

They likewise declared war against the Western conception of rule of law and against any checks on the power of the party.

In other words, the West's China problem, encapsulated by the two Apples, won't be solved with better trade and climate deals. Rather, the growing conflict between the Free World and the Chinese Communist Party is fundamentally ideological.

The crux of the problem is that Beijing will do business with the Free World, and even allow capitalists to make money in its marketplace, but only if they at least tacitly accept Communist values and live by them in their dealings with China.

Here's the question American and Western elites must answer: How many Apple iPhones — or any other cheaply manufactured products — are worth the freedom of not just Jimmy Lai, but oppressed Hong Kongers and mainland Chinese?

Clyde Prestowitz served as a senior trade official and economic adviser in the Obama, Clinton and Reagan administrations. He is the author of "The World Turned Upside Down: America, China and the Struggle for Global Leadership" (Yale, 2021).

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RECOMMENDED 1/5

Senate Testimony: Identifying Market Power in Digital Ecosystems

Michael G. Jacobides, *London Business School*[1]

Their scale and variety can suggest the apps on our smartphones are a boundless market with tremendous choice. This is especially so given that as consumers we tend to merge in our minds the digital products we access on different electronic devices—mobile, tablet, PC, and others—even when, in fact, our experiences with each tend to be far less interchangeable.

This image can obscure the powers that constrain and harm the businesses making these digital goods and the users consuming them. These constraints set in the moment we purchase a smartphone and tighten the more apps we use and purchase, and, in turn, the more locked-in we become. These constraints are not simply a matter of product design, nor are they necessary outcomes of digital ecosystems and their underlying technologies. Rather, they result from an ecosystem strategically engineered to bind otherwise separate choices by consumers and businesses and make them hard to change. I will explain.

Apple and Google may wish to argue that we are free agents when we purchase a smartphone, and that we are not bound to their app stores for accessing digital applications. However, this ignores the reality of the market and consumer behavior.

Smartphones are durable goods, costly and typically lasting 2-3 years for consumers, and most of us already own one, making our next purchase an upgrade. The reality is that very few consumers switch between a phone running iOS and a phone running Android, and for good reason. We do not want to face the learning curve of gaining familiarity with a new operating system—try to operate a smartphone that uses a different operating system; you may struggle to rely on your muscle memory to navigate it. We also do not want to "start over" with our existing applications; in many cases, past purchases and data cannot migrate to the other mobile operating system.

So, our initial choice of smartphone operating system proves to be a particularly enduring investment. Apple technologically and contractually ties this sticky durable good (iOS) to the massive market for the distribution of applications for iOS by mandating that only the Apple App Store can be used to distribute apps to iOS devices.

Google locks consumers into its app store, the Play Store, through a less direct means, by leveraging known consumer behavior and preferences. Google permits alternative app stores on its operating system, Android. But, under the terms for licensing Android, Google ties the Play Store to other popular Google apps. Specifically, Google requires that any preinstallation by OEMs of the Play Store or popular Google apps (e.g., Chrome, Gmail, YouTube, and others) be done as an all-or-none bundle. As OEMs must ship out smartphones with popular apps preinstalled in order to sell a commercially viable product, Google effectively requires the Play Store be preinstalled on Android devices. (This is true outside of China, where the Play

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Store is not supported). As consumers tend to use default settings, the Play Store has risen to be the dominant app store on Android. "Network effects"—which attract buyers to a platform with lots of sellers and vice versa—reinforce the Play Store's incumbency and serve as a barrier to the use of other, emergent pre-installed app stores, such as the Galaxy Store (Samsung). Google further ties its own app store to its apps and the app market by making Google Search apps exclusive to the Play Store.

Other electronic devices are not viable alternatives to smart phones when accessing mobile-first ("native") applications. Smartphones are designed to, and generally do, come with us everywhere we go. They are hand-held and have touch screens and other features and functionalities that support this "mobile" experience. A consumer is unlikely to pull out their laptop at a bar to check if they have any new matches on a dating app—in this context, it is cumbersome to use a laptop, potentially challenging to connect to the internet, and presumably not a great move.

The mobile phone browser is also not a close substitute for mobile-first applications. Take, for example, that slow loading or clunky webpage redirection you might have experienced when using the browser on your phone to navigate an app. Generally, the user experience on a mobile phone browser is inferior, with fewer features, less functionality, and lower performance than apps that are native (i.e., built directly on top of the mobile operating system rather than built for use in a web browser).

Apple and Google, therefore, benefit from massive bases of users who are largely locked-in to a mobile operating system and receive the best performance from apps that necessarily are sold through the App Store on iOS and are very likely to be sold through the Play Store on Android. History and path-dependency has endowed them with significant power in the core markets in the US, the EU, and elsewhere. This is worth contrasting with China, a market with its own pathologies and strong government involvement, which, on the other hand, has supported a more balanced set of app stores, some sponsored by the key platforms such as Tencent/WeChat, some by retail giants like Alibaba, and some by device manufacturers such as Xiaomi and Huawei.

In the US, though, there is a clear dominance of two app stores. Digital businesses selling to these consumers must engage with Apple and Google on these platforms' terms. They cannot effectively access their consumers through alternative means, for the reasons described. They also cannot forgo serving them given their size (and spending power) and because, for many apps, Android users demand being connected to iPhone users and vice versa. With the network effects that characterize such apps, users get more value from the service with each additional user of that service.

As a result, Apple and Google have market power over both developers and the major bodies of consumers that already have iOS or Android smartphones. The question becomes what they do with this power.

Apple and Google's market power over developers allows these platforms to take further steps to disempower developers. In the sale of digital goods, Apple and (with some exceptions) Google give themselves exclusive control over payments processing, which is a key part of the consumer relationship—and, as discussed later, the mechanism through which these platforms impose their supracompetitive commissions. Apple also uses its power to control valuable consumer data from app and in-app digital sales without sharing it back with the developer. This, in turn, helps make any individual developer more replaceable from the vantage point of the platform, especially given the depth of apps available in any given category in the App Store and Play Store.

If regulators are waiting for competition to iOS or Android to disrupt the market power of these platforms, that day is not imminent. In over a decade, there has not been a successful new entrant. And not for lack of funding or innovation capacity—Microsoft, among others, tried and failed. That is because the existing base of users and developers on each platform is a barrier to entry. Users want to use a mobile operating system with existing applications, and developers want to build applications for a mobile operating system with existing users. Again, network effects play a role in consolidating the market towards the incumbents.

The power exercised by Apple and Google over consumers and developers is not the norm. In healthy markets, platforms compete not by locking consumers in and closing off alternatives, but on price and quality. In fact, this distinction can be made through practical criteria, which I created for my research, to identify the existence and strength of market power. They include:

i) Does the platform have exclusive access to a large body of consumers?
ii) Is it difficult for users to multi-home or switch platforms?
iii) Can sellers be replaced without harm to the platform?
iv) Do users benefit from network effects, requiring sellers to multi-home across platforms?
v) Does the platform have an establish network that creates barriers to entry for competitor platforms?

Affirmative answers to these questions indicate market power. By these standards, Apple and Google possess considerable market power, and platforms in other markets do not. In the market for PC gaming, for example, no platform has exclusive access over consumers. Because PC operating systems do not restrict installation of gaming platforms or distribution of games, the same user can be accessed by multiple PC gaming platforms. And because consumers have choice, the platforms tend towards practices that favor consumers, such as enabling switching or multi-homing by making game purchases transferable. Competition over consumers also pressures the platforms to treat sellers more fairly and compete for them. Top game developers are courted by the platforms because, due to the market's power structure, they are not easily replaced without the risk of the platform losing users.

The market power Apple and Google have over consumers and developers leads to real harms. Without competition, Apple and Google can charge a 30% commission on their app store sales and in-app digital purchases. For many developers—with their own brand name to attract consumers and their own payment processing systems or easy access to third-party alternatives—the 30% commission is an outsized take. In other digital markets, significant competition among payment providers has driven down transaction fees to 1-5% of the transaction value, plus a small, fixed fee. These services are provided by firms, such as PayPal and Stripe, that specialize in payments processing and have a track record of providing payment services at large scales across industries and technologies. Exposure to competition in payments would not only pressure Apple to reduce prices, but also to provide developers with improved quality and innovation and share data (e.g., credit card information) from payments with developers.

But today, developers must accept this commission in order to distribute through the App Store and Play Store irrespective of the value developers receive in return. And the harm flows to consumers. The 30% commission directly results in higher prices, as some developers pass through a portion or all of the 30% commission to consumers. For example, YouTube, Amazon Music, Candy Crush, Pandora, Twitch, Facebook, and Tinder are among the top-grossing apps that increase their iOS app prices relative to their web prices to cover the cost. These competitively unconstrained commissions also result in less innovative

products, as developers are left with less revenue for R&D. The 30% commission reduces developers' gross margins because developers may not pass on all of it to consumers, and any price increases that are passed on result in fewer purchases, as higher prices reduce volume of sales. The resulting reduction in revenue diminishes the amount that developers can invest in innovation, research and development, and other quality enhancing investments.

Digital ecosystems orchestrated by platforms are becoming a more prominent feature of our economy, but existing regulatory tools are not well suited to addressing market power in them. Regulation must fully reckon with the forces behind market power in ecosystems orchestrated by platforms. To do so, regulation must move beyond a generic conception of markets, looking at individual markets in isolation, when many dominant platforms harness their power across markets (e.g., Apple and Google's tie-ins from their operating systems to their app stores and then to payment processing). Understanding the ecosystem architecture and the specific rules, and roles, and relationships through which platforms gain market power is necessary to make the regulation of gatekeepers more effective.

One of the greatest challenges of the platform economy is that the complexity of its economics and underlying technology may lead to confusion and regulatory inaction, for fear of interfering with innovation or what powerful platforms often frame as rightful product design choices. Yet, there are important tradeoffs between giving platforms leeway and allowing them to pursue and entrench their power with a heavy price for the businesses and consumers they control. We can start with some simple, collectively agreed upon guidelines for identifying market power in platforms and the resulting harms. I have endeavored to provide such a framework.

London Business School

What Drives and Defines Digital Platform Power?

A framework, with an illustration of App dynamics in the Apple Ecosystem

Michael G. Jacobides, *London Business School*

White Paper, April 19, 2021[1]

Executive Summary

The seemingly inexorable growth of the leading platform businesses coupled with the growing wave of complaints about platform businesses' anti-competitive behavior has drawn attention to the conditions and strategies that give rise to dominance in digital marketplaces. A platform can impose itself as a necessary trading partner, and become a gatekeeper between its consumers and sellers, when these participants do not have alternative channels in which to transact and cannot viably opt-out altogether. Such conditions preclude competition, allowing the dominant platform to exclude sellers or rival platforms from providing certain services and to impose an excessive charge. The harm flows to consumers in the form of higher prices as well as lower quality, less diverse, and less innovative products.

The growing body of work on the drivers of value and competitive advantage in platform businesses, coupled with similar research on the conditions that leave platform participants (buyers and sellers) without alternative channels in which to transact, can be distilled into practical criteria for identifying platform power in major digital marketplaces. The criteria include: (1) Does the platform have exclusive access to a large body of consumers? (2) Is it difficult for users to multi-home or switch platforms? (3) Can sellers be replaced without substantial harm to the platform? (4) Do users benefit from network effects, requiring sellers to multi-home across platforms? (5) Does the platform have an established set of buyers and sellers, creating an effective entry barrier to rival platforms?

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These criteria can be used to evaluate competition in platform marketplaces and identify actors that, due to their gatekeeper power, should be held to a heightened standard of conduct and duty of care. When applying the criteria to several platform marketplaces, I find that in PC gaming, livestreaming, and ridesharing, the inability of platforms to control access to consumers and the prevalence of multi-homing by consumers, among other factors, limit the power of the leading platforms. Not surprisingly, platforms in these three markets face competitive pressures on their fees and services and are limited in their ability to engage in conduct designed to strengthen their market power.

In contrast, the iPhone platform—including the device, operating system, and app store—does control developers' access to consumers. Today, most consumers already own a smartphone. As such, consumers are not making a completely new buying decision, but are typically upgrading their device while continuing to leverage the same operating system and associated apps. Users of iPhones tend to be locked-in to the iPhone family and iOS due to the device's cost, the difficulty in learning a new operating system, and its "stickiness" associated with the cost of and limitations to migrating app purchases and user data to Android due to Apple's restrictions. Although web apps can be accessed on mobile devices outside of the App Store, they are not a substitute for apps that are "native" to (i.e., purpose-built for) the mobile operating system because they are generally inferior in features, functionality, and performance. Developers, in turn, have no viable alternative to the App Store on iPhones and, for the success of their business, often must offer services in the App Store to reach iPhone users and increase the value they deliver to Android users. Thus, developers must tolerate Apple's fees and terms to access consumers. This is true for even the most powerful apps, such as the dating service Tinder.

I further investigate how Apple behaves given its dominant market position. I find direct evidence that Apple exercises its platform power and structural advantages to impose limits to competition—in particular, in distribution and payment options—and extract a (30%) commission that is excessive for some apps. This results in higher prices and a reduction in quality, diversity, and innovation for consumers and, in a vicious circle, puts Apple in a position to strengthen its market power.

1. What Shapes and Defines Platform Dominance

1.1 The Broader Context: Responding to the Growth of Platform Firms

The last few years have seen an explosive growth in the power of platform-based firms (Cusumano, Gawer & Yoffie, 2019), which now occupy four of the top five spots in terms of market capitalization worldwide.[2]

[2] "The 100 Largest Companies in the World by Market Capitalization in 2020." Statista. https://www.statista.com/statistics/263264/top-companies-in-the-world-by-market-capitalization/.

Platform firms have grown even further through the COVID-19 crisis, as we manage our personal and professional world ever more exclusively on our smart devices and as firms further change their business models to accommodate and engage with these new ways of organizing (Jacobides & Reeves, 2020). The question is, should we be concerned with this development and with the growth in market capitalization and margin increase of these firms?

While some pundits have asserted that this all comes down to the prowess of these trailblazers (e.g., Bitton & Lewis, 2020; Voelcker & Baker, 2020), there is growing unease among academics about the rise of platform dominance and abuse. Their concern lies with our ability to identify and address how platform firms restrict competition (Parker et al., 2000) and potentially limit innovation (Scott Morton et al., 2019), to the detriment of final consumers and firms that participate in the ecosystems these platform giants orchestrate (Jacobides, Cennamo & Gawer, 2018).[3] Academics are joined by a growing chorus of parties alleging harm—Apple alone is facing legal battles from Epic in the US and from Spotify in the EU regarding the App Store's exclusionary conduct and the (30%) commission it enables.[4]

Regulators have raised questions concerning the efficacy of existing tools for competition analysis, which tend to apply market definition narrowly, one market at a time, and thereby miss the exercise of dominance by platform giants that harness their power across markets (Khan, 2017; Dolmans & Pesch, 2019). Ecosystems can be regarded as communities of firms that collectively—and, when healthy, collaboratively—produce a good. Production is characterized by "supermodular complementarities that are non-generic, requiring the creation of specific structures of relationships" to create value (Jacobides et al, 2018). In other words, as the players in these communities start to rely heavily on specific interactions with each other in order to realize the greater benefit to the whole community and for the consumer, power can arise as much from dominance in a given market as from the ties between markets.

Major studies calling for a rethink of the regulatory apparatus have been undertaken in the UK (UK Digital Competition Expert Panel, 2019), the EU (Cremer et al., 2019), the US, and many other countries (see, e.g., Lianos & Ivanov, 2019, on the BRICS, and Kerber, 2019, on Germany and Australia as well). For example, the UK's competition authority, following an extensive study, has recommended more robust reforms designed to ensure the principles of "fair trading," "open choices," and "trust and transparency" are protected in digital

[3] This paper looks narrowly at the (anti)competitive effects of platform firms, without entering into the discussion of broader implications to broader societal issues, like issues around platform-based social media and the risk of undermining the democratic process (Cohen, 2019), enhancing misinformation and increasing polarization (Del Vicario, 2016), or drawing on dependencies that ultimately reduce consumer welfare while increasing consumption (Alcott, 2020; Zuboff, 2019).

[4] "The 5 best zingers from Epic's lawsuit against Apple." *Fortune*, August 14, 2020. https://fortune.com/2020/08/14/fortnite-apple-epic-games-lawsuit-app-store/. "Spotify Targets Apple with European Commission Complaint About Music Service, Alleging "Unfair Advantage" Due to Fees for Streaming," *Deadline*, March 13, 2019. https://deadline.com/2019/03/spotify-sues-apple-in-europe-over-music-service-alleging-unfair-advantage-due-to-fees-for-streaming-1202574949/.

marketplaces (Competition and Markets Authority, 2020: 322). Collectively, the proposed rules aim to reduce the opportunity for platforms to manipulate trading terms, self-preference, or engineer information asymmetries. In the US, the House Judiciary Antitrust Subcommittee suggested similarly comprehensive reforms to combat the abuse of market power. Following its investigation into the state of competition in the digital economy, the body recommended: tighter guidelines to prevent mergers and acquisitions that could reduce competition, requirements for interoperability and data portability, restrictions against tying, and controls against self-preferencing.[5]

New laws are emerging to tackle the power of platform businesses, and the EU seems to be at the forefront at these efforts, with a number of new regulatory initiatives and consultations in 2020. These include the New Competition Tool, an update to its Platform-to-Business regulation, the Market Definition Consultation, and the workstreams around the Digital Services Act, including determining regulatory instruments for the large online platforms that depend on network effects and can act as gatekeepers in the EU.

Above all, the new wave of regulation includes the Digital Markets Act (DMA), a proposal released in December 2020 by the EU that is designed to address gatekeepers head-on. The DMA focuses on limiting barriers to entry for new platform competitors and curbing such platforms' ability to abuse dependent businesses and consumers.[6] As proposed, the regulation would initially target firms providing "core platform services," which include online marketplaces, app stores, social networks, web browsers, online search engines, operating systems, and cloud computing services. The draft regulation includes quantitative criteria around levels of revenue, market capitalization, and users for designating a core platform service as a gatekeeper.[7] These quantitative thresholds would apply ex ante, meaning the platforms that qualify would be subject to the DMA's rules irrespective of evidence of harm in the marketplace. An initial estimate suggests that the biggest of Big Tech—the "GAFAM" players of Google, Apple, Facebook, Amazon, and Microsoft—as well as several others

[5] "Investigation of Competition in the Digital Marketplace: Majority Staff Report and Recommendations." Subcommittee on Antitrust, Commercial and Administrative Law of the Committee of the Judiciary. October 6, 2020. https://judiciary.house.gov/uploadedfiles/competition_in_digital_markets.pdf?utm_campaign=4493-519.

[6] "The core platform services in scope are those where there is strong evidence of i) high concentration, where usually one or very few large online platforms set the commercial conditions with considerable autonomy from their (potential) challengers, customers, or consumers; (ii) dependence on a few large online platforms acting as gateways for business users to reach and have interactions with their customers; and (iii) the power by core platform service providers often being misused by means of unfair behavior vis-à-vis economically dependent business users and customers." ("Regulation of the European Parliament and of the Council on Contestable and Fair Markets in the Digital Sector (Digital Markets Act." *European Commission*, December 15, 2020. https://ec.europa.eu/info/sites/info/files/proposal-regulation-single-market-digital-services-digital-services-act_en.pdf.)

[7] Specifically, these criteria are revenue in the European Economic Area greater than €6.5 billion in the last three years, average market capitalization (or equivalent fair market value) greater than €65 billion in the last year, greater than 45 million monthly active end users and greater than 10,000 annual active business users in the last year in the Area.

would qualify (Caffarra & Scott Morton, 2020).[8]

A comprehensive antitrust bill has been proposed in the US as well, the Competition and Antitrust Law Enforcement Act, or "the Klobuchar Bill," after the Senator who introduced it. The bill proposes lowering the standard for regulators to block anticompetitive mergers and switches the burden of proof (for the merger to be justified as procompetitive, rather than not anticompetitive). It also proposes expanding the definition of exclusionary conduct to include behavior that "materially disadvantages" competitors or "tends to foreclose or limit the ability or incentive" of competitors to compete, while giving regulators more resources and tools to identify, challenge, and remedy such behavior.[9]

1.2 The Broader Context: Additional Considerations to Ensure Long-Term Regulatory Effectiveness

Reflecting changing economics, the success (and dominance) of platforms depends on forces, such as network effects and lock-in (Iansiti & Lakhani, 2020), with a gravitational pull on the consumers and firms participating in these ecosystems (Jacobides, 2019a; 2019b). Whether in regard to the final version of the DMA enacted or new regimes in other parts of the world, regulation and enforcement must fully reckon with these forces to be effective. To do so, regulation must move beyond a generic conception of platforms and comprehend how platforms operate and monetize (Caffarra et al., 2020) and the rules, roles, relationships (or "architecture") of the ecosystems which platforms orchestrate (Jacobides & Lianos, 2021). Without such considerations, any fixed criteria for identifying gatekeepers or predefined obligations of gatekeepers could be at risk of falling behind as the Big Tech players find new ways to amass and exercise their power.

A clearer understanding of the forces at play in ecosystems orchestrated by platforms may also allow us to be more clear-eyed in our consideration of the tradeoffs with which we are comfortable as a society—a prerequisite for achieving a "Platform Deal" (Jacobides, 2020). As much of the current literature takes pains to explain, we need a competition framework that distinguishes between competitive dominance and competitive excellence—and its far-reaching benefits—in order to ensure we do not undermine the value-add of the leading platforms (Parker et al, 2020).

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[8] The DMA also allows for a case-by-case qualitative review ("market investigation") of platforms that do not qualify as gatekeepers based on the quantitative criteria but exhibit entrenched power. Two sets of "obligations" on designated gatekeepers would follow: a short list of unqualified obligations and a longer list of tentative obligations that would be "further specified." These obligations are discussed further in this paper's final section on potential regulatory solutions. ("Regulation of the European Parliament and of the Council on Contestable and Fair Markets in the Digital Sector (Digital Markets Act." *European Commission*, December 15, 2020. https://ec.europa.eu/info/sites/info/files/proposal-regulation-single-market-digital-services-digital-services-act_en.pdf.)

[9] "Competition and Antitrust Law Enforcement Reform Act of 2021." United States Congress. February 4, 2021. https://www.congress.gov/117/bills/s225/BILLS-117s225is.pdf

We must start by identifying the factors driving platform power and then consider the harms that may require swift regulatory action, whether *ex ante* or *ex post*. The remainder of this paper is devoted to that task.

1.3 **What Defines Gatekeeper Power and Platform Dominance? Drawing on Current Views**

As economists, business strategists, and regulators have highlighted, network effects and economies of scale enable value creation and cost reduction in a way that can make platform marketplaces prone to "winner takes all" (or "winner takes most") dynamics. The resulting competitive advantages and entry barriers can be significant, as described by the European Commission in 2020:

> "[A]n accumulation of a critical mass of users or device data generates an essentially incontestable competitive advantage that may lead to a situation where once an incumbent is established, the ability to scale up or enter the market may be extremely difficult for any competitor. This is due to the specificities of the platform economy that allow the winner a large competitive advantage due to the economies of scale and of scope, reinforced by data-driven network effects." (DG Connect, 2020: 2)

Network and scale effects can take several forms, and often rely on customer (e.g., buyers and sellers) and data volume. These network effects can provide a competitive advantage for established platforms and be self-reinforcing. For example, as recognized by regulators in Europe, an incumbent platform's advantage over competitors in access to user data can cement and expand its market position through a feedback loop between user data and user growth (Schallbruch, Schweitzer, and Wambach, 2019; UK Competition and Markets Authority, 2020). As succinctly explained by Holland's competition office, "[A] platform with more users can collect more data. That data can be used to further improve the platform's quality, thus attracting more users and allowing even more data to be collected" (Holland Ministry of Economic Affairs and Climate Policy, 2019: 4). For this reason, platforms will sometimes enter into related markets in order to expand their pool of data assets to leverage as a competitive advantage (DG Connect, 2020).

The power of platforms is also shaped by their role in access to consumers. In serving as intermediaries between buyers and sellers, platforms can sometimes become "gatekeepers," gaining exclusive and irreplaceable (or quasi-irreplaceable) access to a large body of consumers (and their data) (Jacobides & Lianos, 2021: 9-10). Such gatekeepers are of particular interest because they can exclude other platforms from accessing the same body of consumers and control the terms of access for sellers on their platform. As an example, Apple's control over both the iPhone hardware and operating system grants it significant control over its ecosystem. Alexiadis and de Streel (2020) provide a useful summary of the different concepts associated with this gatekeeper power, including economic dependency, bottlenecks, and unavoidable trading partner. Although distinct, these concepts describe the problem of a party being forced to deal with a powerful platform for lack of reasonable

alternatives, and I build on them selectively below.

For a seller, the degree of a powerful platform's "unavoidability" can vary. In a report published last year, the Australian competition authority notes that many media businesses rely on new referral services from Google and Facebook, providing these platforms with substantial bargaining power over media businesses (Australian Competition & Consumer Commission, 2019). For an iOS developer, the App Store is an entirely unavoidable intermediary because it is the only channel to distribute apps to iPhone users—and many digital services today do not just offer an app but originate as apps and are therefore nested in the iOS ecosystem. Furthermore, as Crémer, de Montjoye, and Schweitzer (2019) highlight, platforms can impose themselves as gatekeepers even over seemingly fragmented marketplaces.

Whether a platform can leverage its role to gain exclusive access to consumers depends on the extent to which consumers and those providing them services (i.e., complementors) are locked-in to the platform. Platform lock-in can be more comprehensive than traditional lock-in, such as the lock-in described by the US Supreme Court in the Eastman Kodak decision (1993) (see Klein, 1996). In that case, Kodak was found guilty of limiting supply to independent servicers, so as to foreclose rival service providers and prevent them from competitively constraining Kodak's own after-market services for its printers. Consumers with Kodak equipment were locked-in to the Kodak equipment and ecosystem because they had already made significant and hard to reverse investments in that equipment. Kodak's restriction increased the prices Kodak was able to charge for its services.

As with lock-in in more traditional cases, consumers are locked-in to a platform when they are limited to the use of that platform or find it difficult to switch. However, the stickiness of a platform can be strengthened further by an ecosystem of connected services that are interoperable with each other but not with alternatives. For example, the stickiness of the iPhone is strengthened by the ecosystem of adjacent products that integrate seamlessly with each other but not with non-Apple alternatives: Mac computers, iPads, and iWatches. Unlike with aftermarket goods or services, restrictions on the ability of consumers or complementors to multi-home across or switch platforms weakens competitive threats to the platform, rather than simply affecting the prices that can be charged for complementary services. In platform contexts, such tie-ins are important because consumers may not be able to access services outside the platform and because consumers have behavioural predispositions to stick with defaults (Thaler and Sunstein, 2009; Thaler, 2015).

To return to the nature of platform power, if consumers can use multiple platforms (i.e., "multi-home"), then access to these consumers is not limited exclusively to any single platform, and sellers can switch platforms to avoid abuse of platform power. When one side of the platform cannot easily switch or multi-home, the

ecosystem that the platform orchestrates is prone to relationships wherein the platform becomes an "unavoidable intermediary," enabling the platform to exclude rivals and gain market power (Alexiadis and de Streel, 2020; Dolmans and Pesch, 2019). Even those platforms that seem to most expand the horizons of consumers—connecting people and services across the world with a touch of a button—can become like the traditional local monopolist. If a consumer cannot easily switch operating systems, they may be as "stranded" (for alternatives) as the consumer dependent on one store in a rural area. As noted in a report by an expert panel on digital competition assembled by the UK government , such "stranded-ness" may be due to "high switching costs, such as loss of valued personal data or reputational indicators at the point of switching; contract terms that deter switching; technical barriers to switching, such as complex switching processes or a lack of interoperability between the old service and the new or second service; tying services, which can be by contract or technical; and the inertia of defaults" (Digital Competition Expert Panel, 2019: 36).

Due to the high stakes in many platform marketplaces, an incumbent platform can advance its position from market leader constrained by competition to (unconstrained) monopolist through strategies designed to impede switching or multi-homing, and thereby "tip" a market towards a winner-takes-all outcome in its favor (Kerber, 2019). One such strategy to "tip" the market towards a favorable winner-takes-all outcome is to increase customers dependence on the ecosystem and the interconnected web of platforms (Jacobides, 2019a; 2019b), thus ensuring that such barriers to switching become ever stronger. This makes the growth of the "ecosystems" of complementors to these platforms all the more important to platforms (Jacobides et al., 2018; Fuller et al., 2019). As the report by the Stigler Center notes, "The increased scale and scope of control has provided modern digital platform owners with increased power over their ecosystems. Today's platforms understand that they can obtain higher margins if they either make all of the necessary complements themselves or position themselves as a mandatory bottleneck between partners and customers" (2019: 49).

The competitive dynamics of platform marketplaces are also shaped by the bargaining power of the supply side (or "sellers"). As noted in a recent report by an expert panel on digital competition assembled by the UK government, there tends to be a power asymmetry between platforms and the sellers on them (Digital Competition Expert Panel, 2019). This is because consumers are aggregated on one side of the platform, with their access controlled by the platform, whereas sellers are not organized as a collective and individually lack bargaining power to rival the platform's (Digital Competition Expert Panel, 2019). Unfortunately, regulators' overall approach to anticompetitive behavior by platform owners vis-à-vis their complementors seems to be rooted in the imagery of a few strong platforms dealing with a multitude of (at best) small and medium

enterprises.[10] Yet, the control and extraction exhibited by dominant platforms may be applied to complementors beyond the small and weak. In a later section of this paper, I will explain that even large players, including those operating with significant network effects to strengthen their user base, may be affected by the power of platform owners in particular circumstances. It is also important to build a framework that can accommodate the role of the intersection between different platforms, where a series of platforms interact (e.g., Apple and Uber, not just Apple and a set of developers, or Uber and a set of drivers).

Finally, beyond enabling monopoly prices, a platform's market power, or "platform power," can enable it to engage in exclusionary conduct that can increase its ecosystem dominance. An example is a platform leveraging its position or adjusting its rules to preference its own complementary or downstream services (Crémer, de Montjoye, and Schweitzer, 2019; Schallbruch, Schweitzer, and Wambach, 2019; Rietveld et al., 2020). This can enable faster innovation or it can exclude rival products at the expense of consumers. Rietveld et al. (2020) studied how platforms changed their policies as the ecosystem they presided over grew and found that platforms tended to shift from initially creating monetization and market-expanding opportunities for those in their ecosystem, to appropriating such opportunities for themselves. Such "leveraging" of power over a marketplace was one of the main concerns raised by firms in Sweden selling through platforms, according to a 2019 report by the country's competition authority. Among the specific forms of leveraging platforms used, according to the survey, were tying (making use of one service conditional upon the use of another), self-preferencing (by directing users to their own offerings in preference to competitors'[11]), and data hoarding (using customer data to expand into new markets while not sharing the data with their sellers) (Swedish Competition Authority, 2020).

Unlike traditional vertical integration, which eliminates conflicts of interest to reduce double marginalization, platform power can increase conflicts of interest and introduce double (or more) marginalization. The revised Vertical Merger Guidelines from the United States Federal Trade Commission and Department of Justice (2020) address this issue in the context of related products and highlight the incentives of a firm using a related product to disadvantage rival firms. This concept applies well to a platform, which can use its power to foreclose rival complementors or lock in its complementors to reduce the strength of rival platforms.

When platforms have platform power, the harm is not isolated to the sellers they can monopolize. As noted by the British panel of competition experts cited earlier—and as will be illustrated later in this paper—the harm

[10] Indeed, the German law on dependencies that platforms engender rests on the principle of constraints against competition. Its Section 20(1) refers explicitly to "undertakings and associations of undertakings to the extent that small or medium-sized enterprises as suppliers or purchasers of a certain type of goods or commercial services depend on them in such a way that sufficient and reasonable possibilities of switching to other undertakings do not exist (relative market power)" (Alexiadis & de Streel, 2020: 7).
[11] For more details on self-preferencing, see, for example, Crémer, de Montjoye, and Schweitzer (2019).

will "feed through to consumers in the prices they pay, the quality they receive, and the range of innovative new products and services they are able to choose from" (Digital Competition Expert Panel, 2019: 50).

2. A Simple Framework to Define Platform Power

The complexities of platforms and the host of issues they engender—some of which receive short shrift in this paper to maintain focus—often lead to more questions than answers. At the same time, it is imperative that regulators, policy makers, and business strategists converge on straightforward ways to assess the power of platforms. The objective of this section is to offer such a framework, which is intentionally limited. Its focus is not to consider the broader competitive issues that pertain to platforms—for instance, it eschews issues of the leveraging of information and overall consumer welfare loss by the (ab)use of customer behavioural propensities through targeted advertising. Instead, it looks at a few aspects characterizing multi-sided markets that can be used to assess the presence of platform power in digital marketplaces. Our objective is to find platforms that are a combination of a "bottleneck" and an "unavoidable intermediary" and that can leverage their position to control and extract rents. Rather than looking at each platform in terms of objective characteristics (e.g., user or engagement levels), I consider some key qualitative attributes that collectively describe the platform. A guiding principle in this exercise is the question of the "relative replaceability"—a key concept which has also been shown to be significant in explaining who, in a sector or ecosystem, is able to capture value (see Jacobides & Tae, 2015 on the computer sector, or Jacobides, MacDuffie & Tae, 2016, on automobiles). Because a platform benefits when it is less replaceable, it can benefit by engaging in certain exclusionary conduct that makes it essential.

The factors shaping platform power discussed above can be distilled into a set of criteria to assess whether a platform has market power over sellers in a particular marketplace. Whether or not a platform has power, and the strength of its power, can be assessed by the degree to which a platform meets the conditions described below.

1. **Does the platform have exclusive access to a large body of consumers?** If sellers can only access consumers through a single platform, then switching platforms or opting out of that platform results in a seller forgoing access to those consumers. In a competitive market, consumers can be accessed—and accessed equally—through various channels, preventing any given platform from controlling exclusive access to a body of consumers.

2. **Is it difficult for users to multi-home or switch platforms?** If it is difficult—due to cost, effort, or other behavioural or economic reasons—for consumers to use more than one platform or easily switch platforms in a short timeframe in response to a seller being unavailable on a given platform,

then a seller cannot leave a platform without forgoing access to the consumers on it. That is to say, if a seller were to switch away from a platform with high switching costs for (single-homing) consumers, that seller would forgo access to the consumers on that platform.

3. **Are sellers substitutable?** If sellers are easily substitutable to users (e.g., many sellers sell similar goods and services) and the platform controls a substantial part of the customer relationship, users can switch easily between sellers. As a result, consumers can switch sellers more easily than they can switch platforms, and platforms are unaffected by the departure of any given seller, allowing the platform to exercise its power over the seller and foreclose competition without consequences.

4. **Do users benefit from network effects requiring sellers to multi-home across platforms?** If a seller is required to serve a platform in order to maximize the value it can provide to consumers on other platforms, then the seller is inordinately harmed by forgoing service to the first platform. Not only does the seller lose access to the consumers on that platform, the seller provides less value to its consumers on the other platforms, further constraining its ability to opt-out of a platform even in the face of restrictive terms or high pricing.

5. **Platform has an established network, so that network effects and / or its ecosystem and related "stickiness" are an effective barrier to entry for alternative platforms.** If a platform is established, it may have limited need to invest in attracting sellers to stimulate network effects. In contrast, an early-stage platform typically needs to invest in building network effects by attracting sellers, in order to attract users—a hurdle that can present a formidable barrier to entry.

To recap, an analysis of the relative ease of multi-homing and of the options available to different parties—an analysis that can be modelled in terms of collaborative game theory—highlights the nature of power according to basic structural features. For a seller in a platform marketplace, the gatekeeper role of platforms can have severe repercussions when the seller possesses limited bargaining power (e.g., because, individually, it is substitutable) against the platform and lacks alternative channels to access consumers. When a platform has exclusive control of consumers, a "competitive bottleneck" can arise in two-sided markets when the consumer side of the market single-homes (e.g., uses only one smartphone) and the seller side is compelled to multi-home (e.g., develops applications for multiple platforms). Sellers are compelled to multi-home if, due to network effects, their service is less valuable to consumers on one platform if they are disconnected from sellers on another platform. Economic principles predict that when a platform controls access to consumers, consumers single-home, and sellers are required to multi-home due to the scale of those consumers or their importance to other consumers due to network effects, the platform will compete for consumers while charging monopoly prices to sellers for access to those consumers (Athey, 2016).

If a platform is seen to satisfy all these criteria, then we have to hold it to account, as its strength is based on structural features that give it inordinate power and the ability to leverage its position—whether this position was begotten because of impeccable product design and service and a record of innovation or by acquiring rivals and engaging in anticompetitive actions. What matters for firms that have such positions is whether their actions place undue pressure on their complementors and customers alike.

To put it in more technical (legal) terms, in a ruling of the EU's General Court, on the (analogous) case of a dominant position, "a finding that an undertaking has a dominant position is not in itself a recrimination but simply means that, irrespective of the reasons for which it has such a dominant position, the undertaking concerned has a special responsibility not to allow its conduct to impair genuine undistorted competition in the Common Market."[12] This doctrine of "special responsibility," broadly held in a number of legal systems, may, as Sauter (2019) argues, translate in the online world as a "duty of care." The doctrine should go beyond the foreclosure of rivals and, given the multi-sided nature of platforms, apply to the abuse of relationships with direct customers and end consumers. This means that, even absent any other potentially anticompetitive practices such as self-preferencing or data hoarding, dominant platforms have to demonstrate that they do not abuse their relationships with their complementors to extract outsized revenue. This may be particularly relevant in the context of platforms that broaden their scope, potentially "enveloping" other platforms, so as to subsume them, thus reducing competition. While beneficial to the platform from a strategic perspective (see Eisenmann et al., 2011), such behavior raises significant concerns in terms of competition.[13]

But, first, let us apply the framework outlined above, before moving to an examination of whether firms that have such extraordinary power, structural or otherwise, engage in appropriate competitive behavior.

I apply the framework to four marketplaces of significant size and assess the power of their leading platforms. A comparison of the markets for iOS app distribution, PC gaming, live streaming, and ridesharing puts these principles in action and, as we learn, showcases the unique power of Apple. I then delve more deeply into the case of Apple to examine how exactly it uses its position of power, considering a specific case-study of its relationship with a major seller in its own right: Tinder.

3. Applying the Framework: Lessons from Practice

I begin with the marketplace for iOS apps, one of the biggest in terms of number of businesses and consumers

[12] See, e.g., Cases C-322/81, *Michelin v. Commission* EU:C:1983:313, at paragraph 57 and C-413/14 P, *Intel v Commission* EU:C:2017:632, paragraphs 135-136.
[13] This makes envelopment via M&A a particularly important area for further investigation, where arguably the burden of proof may need to be reversed, so that the acquirer should demonstrate that no harm will come to competition.

involved and the scale of revenue. I then, for comparison, apply these criteria to three other digital marketplaces: PC gaming, livestreaming, and ridesharing.

Figure 1: Summary of Platform Power Criteria Applied to Digital Marketplaces

Platform Power Criteria	Digital Marketplaces			
	iOS App Distribution	**PC Gaming**	**Live Streaming**	**Ridesharing**
1. Does the platform have exclusive access to a large body of consumers?	✓	×	×	×
2. Is it difficult for users to multi-home or switch platforms?	✓	×	×	×
3. Are sellers substitutable?	–[14]	×	×	✓
4. Do users benefit from network effects, requiring sellers to multi-home across platforms	✓	×	×	×
5. Does platform have an established network / ecosystem lock-ins, increasing barriers to entry?	✓	✓	✓	×

As discussed below, and as summarized in Figure 1, I find that these other three platforms face competitive constraints that the App Store does not, and I identify some of the results—in terms of product pricing, quality, and innovation—of the competitive pressures exhibited in these other marketplaces.

3.1 iOS App Distribution (and the related market of iOS)

3.1.1 Does the platform have exclusive access to a large body of consumers?

The answer to this question is quite straightforward: Apple controls the functionality of the iPhone, iOS, and the App Store, and by Apple's policy, the App Store is the only way that users can install apps on its iOS devices (Shoemaker, 2019). As a result, there are no viable alternatives to the App Store for developers to reach users on iPhones. "Sideloading," the practice of installing an app through an unofficial distribution channel, is an unrealistic alternative given that it requires removing Apple's software restrictions on the phone (or "jailbreaking"), a process that is technically difficult and can harm the phone's functionality. Pre-installing of

[14] Indicates a mixed result—i.e., there is market power under this criterion but with exceptions.

apps is not a possibility because Apple does not allow third-party apps to be pre-installed.

Behavioral economics and empirical evidence suggest that developers cannot easily reach consumers through web apps, either, as they are a poor substitute for native apps. A report published this year arguing that Apple is competitively constrained states that "the App Store is by no means the exclusive gatekeeper for contracting with iOS users" and that "iOS users can, and do, interact with app developers in various ways… as well as having access to the internet from their smartphone… the vast majority of users also have a PC or Mac and thus access to various web-based app stores" (Voelcker and Baker, 2020: 57).

However, desktop computers and other electronic devices are not a substitute for smartphones for myriad reasons. Users have continuous access to their smartphones, and, to support such unique access to consumers' attention, smartphones are constantly connected to the internet and are hand-held, with touch controls. This explains in part why many digital services today originated as a mobile app and remain mobile-first in their design. Whether it is instant exchange of pictures and videos or "swiping" to accept matches of interest, many of the most engaging features of digital services today are mobile-centric and best supported by native app functionality, and consumers are increasingly conditioned to access digital services on their mobile device over a desktop device. Web apps on mobile devices are not a viable substitute for native apps either because they are generally inferior in features, functions, and performance. Native apps tend to be faster, use less memory, and can make use of native libraries (software infrastructure common to the operating system that can be leveraged) in a manner web apps cannot.[15] As well, Apple exercises control over the browser on iOS devices and does not support certain web app functionalities enabled by other operating systems, further demoting web apps as a potential substitute for native iOS apps. As shown in a later section looking at Tinder as a representative example, consumers are unlikely to access a digital service through its website even when doing so is cheaper.

3.1.2 Is it difficult for users to multi-home or switch platforms?

If consumers could easily switch from iPhones to Android devices, then Apple would have limited power over developers. This is because consumers could quickly and easily make this switch in response to price changes or the lack of availability of specific applications in the App Store. Advocates for Apple have claimed this, stating: "the appropriately defined product market for assessing Apple's App Store practices must at least include Google Play and other Android app stores, as well as alternative channels allowing developers to reach and distribute their content to customers (including iOS users) outside the App Store" (Voelcker and Baker,

[15] See, for example: Viswanathan, Priya. "Native Apps vs Web Apps." *Lifewire*, March 6, 2020. https://www.lifewire.com/native-apps-vs-web-apps-2373133.

2020: 46). However, as noted, non-native mobile apps are not a substitute and iPhone users face challenges to switch to Android because they are locked-in to iOS for reasons that include:

- The high price of smartphones makes it costly for consumers to switch from iPhones to Android devices (or vice versa), so consumers generally wait until they are due for an upgrade. The average price of a consumer smartphone in the U.S. in 2019 was $528.[16] The replacement cycle for smartphones is long and getting longer. 62% of smartphone owners do not intend to buy or get a new smartphone within the next year.[17]

- When consumers upgrade, they prefer features on their existing mobile operating systems. A 2019 Consumer Intelligence Research Partners (CIRP) study of consumers in the U.S. found that 91% of iOS users upgraded to another iPhone.[18]

- Most consumers already own and use many apps, and transferring data and accounts across operating systems (e.g., from an iPhone to an Android device) can be time-consuming and in some cases impossible, resulting in lost user "history" and purchases.[19]

- Apple has created a hardware ecosystem around the iPhone that further increases switching—or, more specifically, "mixing and matching"—costs. Apple offers "Continuity" features between Apple devices— making it easy for consumers to share data across their Macs, iPads and iPhones—but not, for example, between an Apple smartphone and Android tablet.[20] Furthermore, proprietary and costly accessories to devices, such as the Lightning cable, further disincentive switching, as, due to costs and purchasing behavior, consumers may be hesitant to allow such accessories to be rendered useless.

- Apple has introduced consumer programs—warranty, financing, and upgrade—that strengthen consumer lock-in. Apple offers the iPhone Upgrade Program, which allows

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[16] "Average price of smartphones in the United States from 2014 to 2023, by segment." Statista, February 28, 2020. https://www.statista.com/statistics/619830/smartphone-average-price-in-the"-us/. Top end iPhones and Samsung phones (iPhone and Samsung are the most popular smartphone brands in the U.S.; Samsung phones operate an Android operating system) can cost as much as $1,449 for the iPhone 11 Pro and $1,449 for the Samsung Galaxy Z Flip 5G. Samsung. "New Arrival Galaxy Z Flip 5G." https://www.samsung.com/us/mobile/galaxy-z-flip/buy/?modelCode=SM-F707UZAAATT.
[17] Kevin Westcott et al. "Build it and they will embrace it." Deloitte, 2019. https://www2.deloitte.com/content/dam/insights/us/articles/6457_Mobile-trends-survey/DI_Build-it-and-they-will-embrace-it.pdf.
[18] Ben Lovejoy. "iOS and Android loyalty levels higher than ever, Android just ahead for now." January 28, 2019. https://9to5mac.com/2019/01/28/ios-android-loyalty/.
[19] Jesse Simms. "How to transfer messages from iPhone to Android?" *Ting*, June 10, 2019. https://ting.com/blog/you-asked-transferring-texts-from-iphone-to-android/.
[20] "Use Continuity to connect your Mac, iPhone, iPad, iPod touch, and Apple Watch." Apple, July 24, 2020. https://support.apple.com/en-us/HT204681.

consumers to make monthly payments in exchange for AppleCare coverage[21] and a new iPhone every year.[22]

For more detail on the reasons consumers are unlikely to switch away from iPhones and the measures Apple has taken to make them very "sticky," see the Appendix.

Empirical evidence further demonstrates that consumer switching in response to increases in the price of iPhones is low. An extrapolation of this evidence to increases in the all-in price—including all apps and in-app purchases—of iPhones shows that consumers are unlikely to switch devices in response to an increase in the App Store commission. This response can be measured by iPhones' own-price elasticity of demand, which represents the percent change in quantity demanded for a good divided by the percent change in price of that good. The own-price elasticity of demand for iPhones has been estimated as -0.66 (Roberson, 2016). At an average iPhone price of $760,[23] this implies that a $76 increase (10% increase) in iPhone price results in only a 6.6% decrease in quantity of iPhones demanded.

The analysis of consumer switching can be extended to calculate the change in quantity of iPhones demanded given an increase in the App Store commission. This can be done by considering the all-in price of an iPhone (including app and in-app purchases), assuming that consumers consider the all-in price at the time of phone purchase. Passing through the full commission increase to consumers provides a conservative estimate of the extent to which Apple is price constrained by Android devices and Google Play. That is because, by maximizing the price increase that consumers experience in this scenario, it also maximizes the number of consumers who would switch away from iPhones. In this case, a 10% increase in the App Store commission results in an all-in price increase of approximately $12,[24] or a 1.2% increase in the average all-in price for iPhones and app/in-app purchases. Using the same -0.66 price elasticity measure, such a price increase would result in only a 1.0% decrease in quantity of iPhones demanded. Thus, as depicted in Figure 2, relatively few consumers switch from

[21] "AppleCare Products." Apple. https://www.apple.com/support/products/.
[22] "iPhone Upgrade Program." Apple. https://www.apple.com/shop/iphone/iphone-upgrade-program.
[23] Aaron Tilley. "Apple's iPhone Prices Soar, but Not Profit Margins." *The Information*. November 14, 2018. https://www.theinformation.com/articles/apples-iphone-prices-soar-but-not-profit-margins.
[24] The average consumer spend on iPhone premium apps and in-app purchases in 2019 was $100. The average upgrade cycle for smartphones is 32 months. Assuming an individual's monthly average spend on apps is roughly the same throughout his/her entire period of phone ownership, the average consumer spends $267 on apps and faces an all-in price of an iPhone of $1,027. With Apple's 30% commission, developers receive $187 from apps and in-app purchases from the average consumer. To maintain this same $187 take if Apple were to charge a 33% commission, developers would have to charge $279 for the same bundle of apps. See, e.g., Luke Dormehl. "Average iPhone user spending in App Store rockets to $100 in 2019." *Cult of Mac*, March 26, 2020. https://www.cultofmac.com/696389/average-iphone-user-spending-in-app-store-rockets-to-100-in-2019/. See also, e.g., NPD "The Average Upgrade Cycle of a Smartphone in the U.S. is 32 Months, according to NPD Connected Intelligence." July 12, 2018. https://www.npd.com/wps/portal/npd/us/news/press-releases/2018/the-average-upgrade-cycle-of-a-smartphone-in-the-u-s--is-32-months---according-to-npd-connected-intelligence/.

iPhone to Android in response to a 10% increase in price or a small degradation in quality.[25]

The conclusion from these results is that, from the consumer perspective, Google Play on Android and other app distribution channels provide little competitive pressure on Apple's policies and pricing in the App Store. This is not an inevitable outcome of mobile operating systems or app stores as technologies. Rather, it is due to the architecture of the iOS ecosystem that Apple has strategically designed. Mobile operating systems and app distribution markets (i.e., app stores) can be viewed as a foremarket and aftermarket, similar to, though vaster than, the simpler example cited earlier of Kodak's foremarket in printers and aftermarket in the servicing of those printers. In the case of Apple, it involves the upfront purchase of a durable good (iPhone) in a foremarket with switching costs and barriers to entry for competitors, and the distribution of native apps for the iPhone in an aftermarket in which Apple has chosen to foreclose competition and thereby tie the two markets.

As to why consumers purchasing a smartphone for the first time are not dissuaded from choosing an iPhone given the market power Apple would possess over them in app distribution and other aftermarket services, there are various possible explanations. "Information" costs (Carlton & Waldman, 2014) explain in some instances why consumers may unwittingly purchase a durable good that ties them to a monopolized aftermarket. The costly-information theory describes how consumers cannot identify—because the information is not easily available or is difficult to process, for example—the cost of the aftermarket services in their initial choice of the durable good they purchase. Consumers may not be aware of, or internalize in their assessment of cost of ownership, lock-in and associated harm when purchasing an iPhone. The existence of the 30% commission since the App Store's launch more than a decade ago may have also normalized such a rate, making it inconspicuous in practice to consumers (even if it would be expected by theory to fall considerably in the presence of competition).

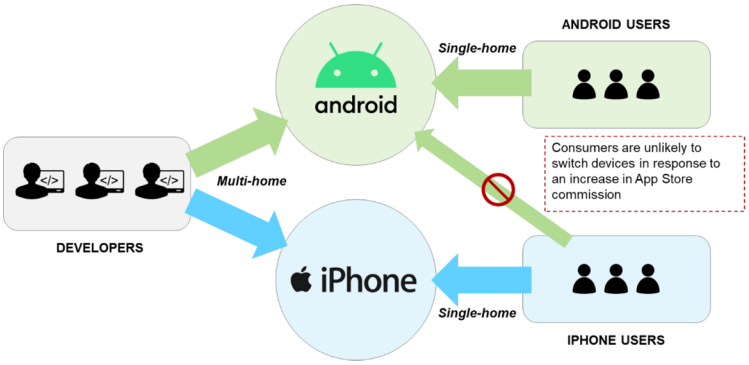
The simpler explanation for why first-time smartphone buyers do not evade Apple's aftermarket dominance may be that the alternative option—and it is singular—faces limited competitive constraints as well. Two operating systems, iOS and Android, control nearly the entire market,[26] each with its own entrenched user base stuck to its operating system.

In short, Apple's market power in the aftermarket of app distribution (i.e., the App Store) originates from Apple's market power in the foremarket of iOS and Apple's tying of these two markets. As will be shown in

[25] A small price increase has the same effect as a small degradation in quality, as both reduce the aggregate utility that a buyer receives from an iPhone.
[26] In the US, iOS and Android represent more than 99% of the mobile operating system market. (StatCounter. "Mobile Operating System Market Share United States of America." https://gs.statcounter.com/os-market-share/mobile/united-states-of-america)

the later section on other marketplaces, this feature of the iOS ecosystem—the tied foremarket and aftermarket—is not standard across digital ecosystems and explains the App Store's market power as much as any of Apple's restrictive policies within the App Store.

Figure 2: Consumers face significant frictions to substitute away from iPhone



Because iPhone users are locked-in to iOS and the App Store, developers are likewise committed to accessing those consumers through the App Store. Developer behavior is further evidence that consumers do not easily switch between mobile operating systems. If consumers could easily switch between platforms to access specific applications, developers might choose to offer their apps on only one platform given the additional cost of developing for multiple platforms. However, the top revenue generating developers do not choose to offer their apps on only one platform. In fact, among the top 250 apps by revenue in Apple's App Store in the United States in 2019, 245 were available on Google Play. Among the top 250 apps by revenue on Google Play in the United States in 2019, 249 were available in Apple's App Store.[27]

3.1.3 Can sellers (apps) be replaced without substantial harm to the platform?

Many consumers substitute between apps and use multiple apps in the same category. For example, consumers of dating services use, on average, of 2.4 different dating services.[28] Due to app multihoming by consumers and the availability of substitutes, the departure of any given app from the App Store may result in a negligible

[27] AppMagic; data available upon request.
[28] "Online Dating Statistics: 60% of users look for long term relationships," *ReportLinker*, February 9, 2017. https://www.reportlinker.com/insight/finding-love-online.html.

change in the value consumers receive from the platform.[29] As such, Apple is not harmed by the prospect of an app's departure from iOS, as this departure would not result in consumers switching to Android to access the app. Notice the lack of symmetry, as users tend to have only *one* OS (either Android or iOS), meaning that a developer that does not sell its application in the App Store could not sell to those same consumers through Google Play, whereas consumers have many apps of the same kind.

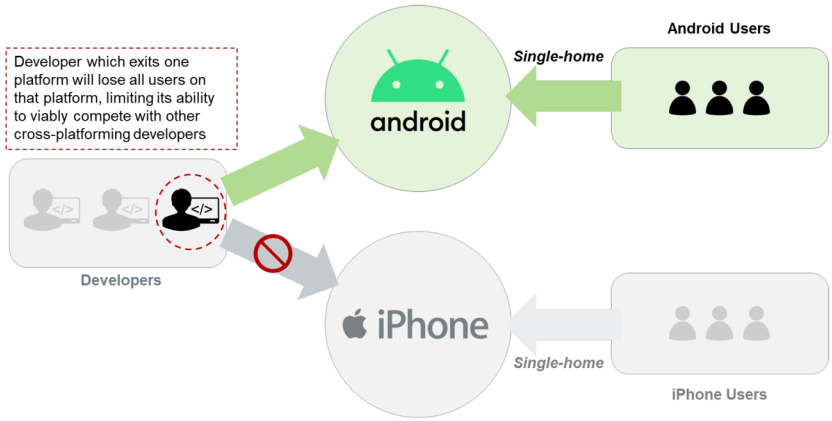
3.1.4 Do users benefit from network effects, requiring sellers to multi-home across platforms?

Many apps are subject to strong network effects, which require these apps to serve users on different mobile platforms in order to maximize the value they provide to users on any given platform. That is, because *users* benefit from network effects, app developers are *forced* to engage with a platform. Dating apps are a prime example: a Tinder user on Android benefits from Tinder's availability to users on iPhones, as this availability expands the pool of potential matches. Such network effects are particularly strong for dating apps because they facilitate social, rather than economic, transactions in which individual preferences for a partner with whom to match are likely to be highly heterogeneous (based on social, economic, or physical attributes, among others). A 2016 study on dating apps in Brazil found empirical evidence of this effect. That study found that the merger of two rival apps, which increased the total population of users available to match with for users of each individual app, increased total revenue by 22% for the combined dating service, as compared to the revenues for the two services independently.[30] This makes the App Store an unavoidable trading partner, with the competitive implications this entails. Combined with the fact that apps are substitutable, the importance of network effects for apps indicates that apps have limited ability to opt-out of a major platforms, as depicted in Figure 3.

[29] However, the elimination of Google Maps from the iPhone suggests that consumers notice particular apps that are removed when the quality differential is big enough.

[30] Gordon Burtch and Jui Ramaprasad. "Assessing and Quantifying Local Network Effects in an Online Dating Market." *NET Institute Working Paper No. 16-05*. SSRN, September 30, 2016. http://dx.doi.org/10.2139/ssrn.2848515

Figure 3: Multi-homing developers are not able bargain with exiting the platform



3.1.5 Does the platform have an established network / ecosystem lock-ins, increasing barriers to entry?

While Apple may have faced pressure to attract sellers in the time immediately after the launch of the App Store in 2008, this pressure subsided once Apple established a critical mass of sellers. This critical mass of sellers attracted more consumers, which attracted more sellers, and so on. These network effects formed a competitive barrier around the App Store. This was noted, for example, in a Morningstar financial report: "Network effects may be forming around Apple's apps developers, as a more robust apps store is likely helping Apple attract new customers" (Morningstar, 2017). Today, after having been in existence and building its network for more than a decade, Apple has 1.85 million apps[31] on the App Store to serve approximately 900 million iPhones in circulation[32]. This volume of apps is a significant barrier to entry, as any potential competitors to the App Store must attract a sufficient number of apps to become a viable competitor.

Furthermore, Apple has created an ecosystem around its phone. It has done this by linking different services offered through the phone itself, making switching hard for all the reasons identified in the Furman and Stigler report. It has also done this by expanding its suite of devices (from Apple PCs and TV to iPad and watches), making switching away from the Apple iOS ever more pragmatically difficult and unlikely.

Even if a competitor were able to attract a sufficient number of apps, that competitor would still not be able

[31] J. Clement. "Number of apps available in leading app stores as of 1st quarter 2020." Statista. https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/.
[32] Mark Sullivan. "Fact: Apple reveals it has 900 million iPhones in the wild." *Fast Company*, January 29, 2019. https://www.fastcompany.com/90298944/fact-apple-reveals-it-has-900-million-iphones-in-the-wild.

to compete with the App Store for app distribution to iOS users for the simple reason that Apple does not allow alternative app stores on iOS devices.

In all, Apple emerges as a quintessential example of a dominant gatekeeper, with extraordinary power, which, enables Apple to restrict competition and charge such high fees. Yet, not all dominant platforms fulfill these criteria. The criteria that explain the power of the App Store can be applied to other digital marketplaces. Below, we consider platforms in PC gaming, live streaming, and ridesharing and find that they do not have gatekeeper power.

3.2 PC Gaming Platforms

In the PC gaming marketplace, platforms take a percentage of revenue from game sales and in-game purchases. PC gaming platforms connect consumers with video games played on personal computers. The marketplace includes a number of platforms, including market leader Steam (with 50-70% market share),[33] Epic Games Store, Good Old Games ("GOG"), and Origin.[34] (Apple and Microsoft both have app stores native to their operating systems, but they are minor players—with a limited number of users, games available, and platform features—and therefore not included among the platforms discussed in this section).[35] An examination of each of the platform power criteria listed above demonstrate the lack of power held by any given PC gaming platform.

3.2.1. Does the platform have exclusive access to a large body of consumers?

No platform, including market leader Steam, has exclusive access over consumers in the PC gaming marketplace. Because PC operating systems do not restrict installation of platforms or games, the same user can be accessed through multiple PC gaming platforms. Furthermore, sideloading is sometimes possible in PC gaming: users can purchase a game through one platform and transfer it to their account with another platform. In short, no one platform possesses a chokepoint for controlling users or the distribution of games to those particular users.

3.2.2 Is it difficult for users to multi-home or switch platforms?

Users can easily multi-home or switch platforms. Multi-homing is relatively seamless, as users can create

[33] Arthur Zuckerman "75 Steam Statistics: 2019/2020 Facts, Market Share & Data Analysis." *CompareCamp*, May 15, 2020. https://comparecamp.com/steam-statistics/.
[34] See, for example, this list of gaming platforms from 2019: Scott Prescott. "The most popular desktop gaming clients, ranked." *PCGamer*, July 5, 2019. https://www.pcgamer.com/the-most-popular-desktop-gaming-clients-ranked/.
[35] For a review of Apple's PC app store, for example, see Tim Brookes. "How to Play Games on a Mac in 2019." *How to Geek*, July 20, 2019. https://www.howtogeek.com/428113/how-to-play-games-on-a-mac-in-2019/.

accounts with multiple platforms on their PC. Furthermore, there are limited barriers for consumers to multi-home or switch platforms: purchasing new hardware, breaking existing contracts, or learning a new operating system are not required. Users can continue to play previously purchased games on their "old" platform while making any future purchases on their "new" platform.

3.2.3 Can sellers (game developers) be replaced without substantial harm to the platform?

In PC gaming, highly differentiated games cannot be substituted easily by the platforms. Specialized third-party games, such as Grand Theft Auto and Troy Total War, have strong fan bases that will follow games regardless of the platform through which they are distributed. It is for this reason that platforms have negotiated exclusive contracts or other agreements with top games to attract users. An example of this is Epic's deal with Troy Total War, which made the game exclusive to Epic for one year.[36] In a recent promotional event, Epic sponsored a 24-hour free giveaway of Troy Total War that attracted 7.5 million downloads, the cost of which was covered by Epic. The willingness of Epic to sponsor this marketing event for Troy Total War highlights Epic's need to offer incentives to consumers and developers to attract them to its platform.

Another example is the competition, and ensuring competing down of rates, for game developers after the Epic Games Store launched in 2018 with a substantially lower commission than Steam, at 12%. This lower price-point incentivized game developers to move to Epic and pressured Steam to respond with concessions to game developers, who would otherwise easily move to Epic's platform. Specifically, to better incentivize the top games to continue distributing on its platform, Steam began offering volume-adjusted commissions, providing discounts to top-grossing games.[37]

3.2.4 Do users benefit from network effects, requiring sellers to multi-home across platforms?

Users experience limited benefits from network effects when sellers multi-home across platforms. For most games, users experience diminishing benefits from increases in the pool of players on their platform after a critical mass of players has been established. Unlike marketplaces for dating and employment, for example, in which consumers place a premium on having access to as many potential matches as possible given significant differences in preferences (i.e., the importance of finding an optimal match), most consumers in gaming marketplaces can be satisfied with the amount of users on a single platform as long as that user base is large

[36] Nathan P. Gibson. "A Total War Saga: Troy Scores 7.5 Million Users from Epic Games Store." *Screen Rant,* August 14, 2020. https://screenrant.com/total-war-saga-troy-7-million-downloads-epic-games-store/.
[37] Epic Games announced its 12% commission on the Epic Games Store on December 4, 2018. See: Tim Sweeney. "Announcing the Epic Games store The Unreal Engine." December 04, 2018. https://www.unrealengine.com/en-US/blog/announcing-the-epic-games-store. Less than a week earlier, Steam announced a new revenue share for its PC gaming platform. See: Nick Statt. "Valve's new Steam revenue agreement gives more money to game developers." *The Verge*, November 30, 2018. https://www.theverge.com/2018/11/30/18120577/valve-steam-game-marketplace-revenue-split-new-rules-competition.

enough to ensure availability of sufficient players of comparable skill.

3.2.5 Does the platform have an established network / ecosystem lock-ins, increasing barriers to entry?

As with the market for iOS apps, the incumbent platforms have established networks, increasing barriers to entry for potential rivals. Steam had over 95 million monthly active users in 2019.[38] This large user base is attractive to developers and makes Steam a natural place for developers to promote and distribute games.[39] To successfully enter and appeal to sellers, a new platform needs to attract sufficient consumers and offer a compelling value proposition to rival Steam's significant user base. This challenge acts as a barrier to entry. However, the surging popularity of the upstart Epic Games Store, which, little more than a year after its launch, claimed to have surpassed Steam in its number of active users, suggests rivals can viably contest the incumbent.[40]

Overall, these criteria show that individual platforms in the PC gaming marketplace have limited power. While the final criterion suggests market leaders have a degree of platform power, the lack of a chokepoint and the existence of greater competition in the other criteria mean that the platforms do not have inordinate power over their complementors.

Due to competition between PC gaming platforms, market leader Steam is constrained from engaging in exclusionary conduct to gain market power or exact an excessive commission: the marketplace's complementors have various distribution options and those distribution options have limited lock-in given that consumers can easily switch between platforms. And, as described, this competition has pushed down platform commissions.

3.3 Live Streaming Platforms

In live streaming marketplaces, platforms take a percentage of streamer revenue from in-platform donations and subscriptions.[41] Live streaming covers a range of content; gaming is the most prominent. The marketplace includes a number of platforms, such as market leader Twitch,[42] YouTube, and Facebook Gaming. An

[38] Derek Strickland. "Steam grew to nearly 95 million monthly active users in 2019." *Tweaktown*, February 8, 2020. https://www.tweaktown.com/news/70495/steam-grew-to-nearly-95-million-monthly-active-users-in-2019/index.html
[39] Samuel Horti. "Is it worth cutting out Steam to sell indie games direct?" *PCGamer*, March 07, 2018. https://www.pcgamer.com/is-it-worth-cutting-out-steam-to-sell-indie-games-direct/.
[40] "Epic Games Store Weekly Free Games in 2020!" *Epic Games*, January 14, 2020. https://www.epicgames.com/store/en-US/news/epic-games-store-weekly-free-games-in-2020.
[41] Financial support from viewers is a main channel of revenue for streamers. On YouTube, Twitch, and Facebook Gaming, viewers can "subscribe" to a streamer, paying $4.99 (on PC) monthly in exchange for select features such as emotes. (Twitch offers different levels of subscriptions, costing up to $24.99). Facebook offers a comparable product, also charging viewers $4.99 for subscriptions.
[42] Twitch has over 60% market share in the Americas and Europe. See: Amrita Khalid. "YouTube is now the biggest threat to Twitch." *Quartz*, January 28, 2020. https://qz.com/1792011/twitch-is-losing-users-to-youtube-and-other-live-stream-platforms/.

examination of each of the platform power criteria demonstrates the competitive constraints live streaming platforms face.

3.3.1. Does the platform have exclusive access to a large body of consumers?

Platforms do not have exclusive access to consumers in the live streaming marketplace. The same user can be accessed through multiple platforms on the same or different types of devices.

3.3.2 Is it difficult for users to multi-home or switch platforms?

In this case, it is straightforward for users to multi-home across platforms or switch platforms. Users can access a new platform in many cases by simply visiting a website or through an easy registration process—creating an account requires a few minutes of effort. Furthermore, switching or multi-homing imposes no monetary costs and limited frictions, as different platforms can be accessed through the browser on the same device. As a result, "Viewers can easily visit other live streaming sites if they prefer."[43]

3.3.3 Can sellers (streamers) be replaced without substantial harm to the platform?

The top streamers are not easily substitutable for the platform. Top streamers are a critical attraction for consumers of live streaming, making it important for platforms to invest resources in attracting and retaining top streamers. This occurred, for example, when popular streamer Tyler Blevins, better known as "Ninja," left Twitch for Mixer, a now-defunct rival platform that courted him with an exclusive contract worth $20-30 million[44] and the prospect of personally shaping the nascent platform. Other top streamers, including Jack "Courage" Dunlop, Mike "Shroud" Grzesiek, Jeremy "Disguised Toast" Wang left Twitch as well, drawn by lucrative contracts and opportunities to influence the market and its ecosystem.[45] Although some star streamers, such as Blevins, returned to Twitch after the closure of Mixer, the continuous fight by live streaming platforms over streamer talent highlights the power held by the streamers. Commenting on his return to Twitch, Blevins highlighted his agency in the decision: "I really took my time to decide which platform was best and Twitch has been very supportive throughout this process and understanding my overall career goals."[46] Beyond the special deals granted to such star streamers, a wider pool of popular streamers are solicited through reduced

[43] Sean L. "Twitch.tv: Amazon's Billion-Dollar Bet on Network Effects in Streaming Video." *Digital HBS*, October 19, 2015. https://digital.hbs.edu/platform-digit/submission/twitch-tv-amazons-billion-dollar-bet-on-network-effects-in-streaming-video/.
[44] Paul Tassi. "A Post-Mixer Ninja Picks YouTube Gaming Over a Return to Twitch." *Forbes*. July 8, 2020. https://www.forbes.com/sites/paultassi/2020/07/08/a-post-mixer-ninja-picks-youtube-gaming-over-a-return-to-twitch/#6ebda5df74c3.
[45] Austen Goslin. "The mass Twitch exodus: Why streamers are leaving." *Polygon*, January 27, 2020. https://www.polygon.com/2020/1/27/21043450/twitch-streamers-leaving-mixer-facebook-youtube-ninja-shroud-disguisedtoast.
[46] Elise Favis. "Ninja is returning to Twitch." *Washington Post*, September 10, 2020. https://www.washingtonpost.com/video-games/2020/09/10/ninja-returns-to-twitch/.

commissions (e.g., on Twitch, streamers generally keep 50% of subscription revenues, but top streamers keep 70%),[47] demonstrating their value to the platforms.

3.3.4 Do users benefit from network effects, requiring sellers to multi-home across platforms?

Direct network effects for users are weak in live streaming. The primary value consumers derive from live streaming platforms is from viewing or supporting their favorite streamers. Evidence suggests that many viewers do not use live streaming platforms to engage with other viewers, minimizing the value of any direct network effects.[48] Because of this, viewers do not benefit if their streamers are available on multiple platforms. Notably, several top streamers have chosen not to multi-home, signing exclusive contracts intended to strengthen the user base and brand of the platform sponsoring them.[49]

3.3.5 Does the platform have an established network / ecosystem lock-ins, increasing barriers to entry?

As with the previous two cases, network effects create a barrier to entry in live streaming and new entrants must overcome the traditional chicken-and-egg problem in platform entry. In a recent estimate, Twitch has 37.5 million monthly active users in the U.S. and over two million streamers.[50] The challenge that potential platforms face in attracting streamers or viewers can act as a sizable barrier to entry, though new platforms have successfully emerged after Twitch.

Following the introduction of Twitch as a video game live streaming platform in 2011,[51] multiple rival platforms were launched: YouTube's live streaming platform in 2015, Mixer in 2016[52] (later acquired by Microsoft) and Facebook's launch of live streaming functionality in 2016.[53] These new entrants were able to attract big-name streamers, as Mixer did with Ninja and Shroud from Twitch.[54] Even after the closure of Mixer, other platforms,

[47] Timothy J. Seppala "This is what success looks like on Twitch." *Engadget*, October 17, 2015. https://www.engadget.com/2015-10-17-this-is-what-success-looks-like-on-twitch.html.
[48] SCU. "Why is Twitch.tv is an internet culture?" https://webpages.scu.edu/ftp/adtran/cultural_text/definitional.html.
[49] Gene Park. "Twitch signs three major streamers to exclusive contracts." *Washington Post*, December 10, 2019. https://www.washingtonpost.com/video-games/2019/12/10/twitch-signs-three-major-streamers-exclusive-contracts/.
[50] See, e.g., Sarah Perez. "Twitch to top 40 million US viewers next year, forecast says." *TechCrunch*, February 20, 2020. https://techcrunch.com/2020/02/20/twitch-to-top-40-million-u-s-viewers-next-year-forecast-says, and Twitch. "Frequently Asked Questions." https://www.twitch.tv/p/partners/faq/.
[51] David M. Ewalt. "The ESPN of Video Games." *Forbes*, November 13, 2013. https://www.forbes.com/sites/davidewalt/2013/11/13/the-espn-of-video-games/#1a2e5133dd79.
[52] Darrell Etherington. "Microsoft acquires Beam interactive game live streaming service." *TechCrunch*, August 11, 2016. https://techcrunch.com/2016/08/11/microsoft-acquires-beam-interactive-game-livestreaming-service/
[53] Andrew Webster. "You can now stream any Blizzard game live on Facebook." *The Verge*, August 26, 2016. https://www.theverge.com/2016/8/26/12661276/blizzard-facebook-live-streaming-launch.
[54] Paul Tassi. "A Post-Mixer Ninja Picks YouTube Gaming Over a Return to Twitch." *Forbes*, July 08, 2020. https://www.forbes.com/sites/paultassi/2020/07/08/a-post-mixer-ninja-picks-youtube-gaming-over-a-return-to-twitch/#6ebda5df74c3.

such as YouTube and Facebook Gaming, rivalling the incumbent remained "alive and well."[55] New entrants have competed by offering special features or compensation to top streamers in order to attract users. Twitch, the market leader, continues to offer multiyear contracts and other incentives to attract and retain top streamers, suggesting that no platform can idly depend on its existing roster of streamers. The use of multi-year contracts and Twitch's reductions in commissions for top streamers demonstrate that existing or potential rivals competitively constrain incumbents.

In all, the absence of a true gatekeeper position for any platform enables competition, which puts downward pressure on platform commissions and upward pressure on platform quality and innovation. This happens despite the clear impact of network effects

The most direct result of competition in this marketplace is the competitive pressure on platforms commissions already described. Twitch reduced its platform commission by 20 percentage points for top streamers. Facebook has gone further, reducing its commission on sales of subscriptions to streamers from 30% to 0% in August 2020.[56] This reduction is anticipated to last one year, in what seems to be an attempt by Facebook to attract new streamers and users.

Even so, the reduction is substantial in a market in which platforms bear substantial costs in the delivery of services to consumers. On the front end, the platforms typically manage the consumer interface, where users view videos, as well as various apps tailored to the different devices and operating systems of users. Most importantly, the platforms provide the critical infrastructure for the delivery of seller services to consumers, most notably the bandwidth that allows streamers to stream live content to massive audiences.[57]

In addition to creating downward pressure on commissions, competition has created upward pressure on innovation, which is manifested in the features and functionalities that platforms offer streamers and viewers. One notable innovation in live streaming is in payment systems. Many streamers accept from viewers direct donations, which they rely upon as a significant source of income. For a time, most donations went through PayPal. While PayPal allowed streamers to keep 100% of donations, donations through PayPal carried a risk of chargebacks, in which a donator could cancel a donation weeks after it was made, forcing the streamer to repay

[55] Kellen Browning. "Return of the King: Ninja, a Video Game Star, Goes Back to Twitch." *New York Times*, September 10, 2020. https://www.nytimes.com/2020/09/10/business/ninja-stream-twitch.html.
[56] "About Fan Subscription Payouts." Facebook Business Help Center. https://www.facebook.com/business/help/646162679132229.
[57] For a description of the infrastructure provided by platforms in livestreaming for the delivery of streams from streamers to audiences, see, for example: "Finding the Streaming Media Infrastructure That Fits You best." *Wowza Media Systems*, 2016. https://www.wowza.com/uploads/images/Wowza-Deployments-OnPrem-Cloud-Hybrid.pdf.

the money and pay an additional fee to PayPal.[58] Twitch provided an innovative payment solution to this issue by introducing Twitch Bits in 2016,[59] which provides streamers with greater payment protection by eliminating the risk of chargebacks. For this service, Twitch takes a commission on donations of between 20% and 30%.[60] Facebook followed Twitch's lead by offering a similar donation system, called "stars," in 2018.[61] The open playing field in this market allowed Twitch to introduce an innovation and Facebook to respond with one of its own, in a virtuous cycle that is impossible when alternative payment solutions are foreclosed in the first place.

3.4 Ride-Sharing Platforms

Ridesharing platforms such as Uber and Lyft match riders to drivers in real time, conduct quality control and safety services for drivers and riders, and provide other ancillary services (mostly to drivers, e.g., car financing). In return, these platforms take a percentage of the fare paid to drivers. An examination of each component of the platform power criteria demonstrates the competitive constraints faced by ridesharing platforms.

3.4.1 Does the platform have exclusive access to a large body of consumers?

Ridesharing platforms do not have exclusive access to consumers. As with PC gaming and live streaming, the hardware and operating system that consumers use for ridesharing services are not controlled by any of the ridesharing apps.

3.4.2 Is it difficult for users to multi-home or switch platforms?

Consumers can effortlessly install multiple ride-sharing apps on their phone, enabling consumers to switch platforms, and even continuously multi-home and compare wait times and prices between different platforms. To reduce multi-homing frictions even further, products have emerged to perform such price comparison on behalf of consumers.[62] Furthermore, consumers do not incur additional fees or face additional burdens in maintaining accounts on multiple platforms.

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[58] Saira Mueller and Gökhan Çakır. "Twitch donations and PayPal: Everything You Need to Know About Chargebacks." *Dot Esports*, June 12, 2020. https://dotesports.com/general/news/paypal-twitch-chargebacks-3739.
[59] Aaron Souppouris. "Twitch introduces 'Cheering' Emotes for Tipping Streamers." *Engadget*, June 27, 2016. https://www.engadget.com/2016-06-27-twitch-cheering-beta-bits-currency-tips.html.
[60] Aaron Souppouris. "Twitch introduces 'Cheering' Emotes for Tipping Streamers." *Engadget*, June 27, 2016. https://www.engadget.com/2016-06-27-twitch-cheering-beta-bits-currency-tips.html.
[61] John Constine. "Facebook launches Fb.gg gaming video hub to compete with Twitch." *TechCrunch*, June 7, 2018. https://techcrunch.com/2018/06/07/facebook-launches-fb-gg-gaming-video-hub-to-compete-with-twitch/.
[62] See, e.g., "4 Apps that Compare Rideshare (Uber, Lyft, Juno, etc.) Prices and Wait Times," *Hello Tech*, September 10, 2018. https://www.hellotech.com/blog/4-apps-that-compare-rideshare-uber-lyft-juno-etc-prices-and-wait-times.

3.4.3 Can sellers (drivers) be replaced without substantial harm to the platform?

When requesting a ride, passengers select a destination, but do not select a driver. Ridesharing apps will generally locate the closest driver. Thus, drivers have little ability to differentiate themselves or develop a "following" of riders and as such do not have bargaining power over platforms.

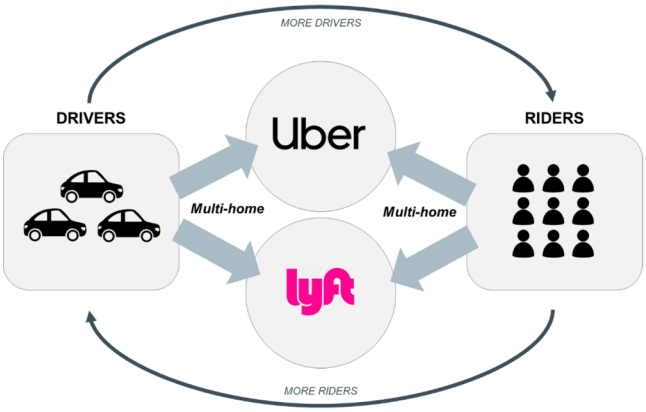
3.4.4 Do users benefit from network effects, requiring sellers to multi-home across platforms?

A driver's participation on additional platforms does not affect the value a rider receives from the driver on the platform through which they matched. That is to say, the rider does not suffer from being "cut off" from riders on the other platform vis-à-vis the driver.

3.4.5 Does the platform have an established network / ecosystem lock-ins, increasing barriers to entry?

Ridesharing apps have established networks of drivers who have been approved by the platform, and riders who have installed the app. However, they form fragmented user bases due to the localized nature of ridesharing. This is offset in part by the brand power that gives an incumbent platform an advantage across geographies in a market in which trust matters (to enter a stranger's car) and is conferred primarily by the platform. Furthermore, ridesharing apps are used by travelers, mitigating the localized nature of ridesharing networks to a degree. Ultimately, however, the entry of new competitor platforms in numerous local markets reflects that, overall, the established networks of incumbents do not preclude ongoing entry. Due to the above factors, ridesharing is characterized by intense competition. As described above and depicted in Figure 4, both drivers and riders multi-home (i.e., use multiple platforms), which enables network effects to operate at the market level. That is to say, the virtuous feedback loop between new riders and new drivers—additional riders make the platform more valuable to drivers, and vice versa—draws more participants into the market but not necessarily onto a single platform. As a result, if one platform offers better prices or features, consumers will flock to that platform. The fact that both sides of the platform multi-home precludes one platform from gaining a competitive bottleneck and enables heated competition between platforms in the form of reduced commissions and greater platform quality.

Figure 4: Competition in Ridesharing



This healthy competitive dynamic is evidenced by frequent driver promotions and discounts. As an example, Uber has spent significant amounts on "excess driver incentives," or payments to drivers that were greater than the revenue earned from driver trips.[63] The fact that Uber took effectively zero commission on these trips highlights the competitive pressure that ridesharing platforms face in attracting drivers. When competitive pressure weakens, platforms can increase their commission and withdraw promotions. For example, after Uber and Didi merged in China in 2016, the effective platform commission rose, with consumers paying more and drivers receiving fewer bonuses.[64] It was not long, however, before the introduction of new platforms reinvigorated competition and lowered platform commissions. As part of its initial push for market share in China in 2018, new entrant AutoNavi charged no commission to drivers.[65] Price-comparing riders could easily multi-home, and drivers shifted platforms according to incentives. "If Didi doesn't match up in subsidy payments then people will go to Meituan," a driver is quoted as saying, in reference to the ridesharing upstart

[63] Alison Griswold. "Famously unprofitable Amazon has nothing on Uber." *Quartz*, April 11, 2019. https://qz.com/1592971/uber-ipo-filling-reveals-how-it-spends-its-money/.
[64] Josh Horwitz. "One year after the Uber-Didi merger, it's only getting harder to hail a ride in China." *Quartz*, August 3, 2017. https://qz.com/1045268/one-year-after-the-uber-didi-merger-its-only-getting-harder-to-hail-a-ride-in-china/.
[65] Yue Wang. "Didi Chuxing Faces Stiff Competition in Race to Dominate China's Ride-Sharing Market." *Forbes*, April 11, 2018. https://www.forbes.com/sites/ywang/2018/04/11/didi-chuxing-faces-stiff-competition-in-race-to-dominate-chinas-ride-sharing-market/#dc93cf54a1e5

Meituan.[66] Despite its dominant market share—around 80% of the market in China in 2019[67]—Didi is competitively constrained, as both riders and drivers are able to switch platforms according to the favorability of the terms offered by each platform. In addition to providing higher revenue to drivers and lower costs to riders directly, competition in ridesharing has also resulted in platforms delivering improvements in their quality of service. Most notably, the presence of rival platforms in ridesharing has reduced wait times for riders and idle time for drivers (Bryan and Gans, 2018).

4. From Platform Dominance to Anticompetitive Effects: Assessing a Platform's Exclusionary Conduct, With an Application to the Apple-Tinder Relationship

The analysis above suggests that Apple—more specifically its iPhone, iOS, and App Store—has a dominant position. To understand the practical implications of this dominance, we should look at Apple's behavior towards other players. To be conservative in looking at Apple's conduct enabled by its dominant position, we will focus on its relationship with a particularly strong player, Tinder, which is among the top-grossing apps in the App Store.

Based on our analysis of the App Store and app developers for iOS, Tinder faces the dilemmas of any firm working under such restrictive conditions. It clearly cannot forgo such a sizeable and affluent demographic as iOS users or deliver less value to Android users expecting the full set of matching options. So, whether it likes it or not, Tinder has to deal with this gatekeeper and work within the bounds of what Apple offers.[68] This is amplified by the (unsurprising) fact that most users of Tinder do not choose to interact with its dating service through its web-based substitutes, despite cheaper prices on web browsers,[69] due to the behavioural stickiness explained earlier. For Tinder users in the United States, fewer than 4% of outstanding Tinder subscriptions were purchased through a web browser.[70]

How, then, does Apple use its privileged position, which, according to the doctrine of responsibility, should

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[66] Yue Wang. "Didi Chuxing Faces Stiff Competition in Race to Dominate China's Ride-Sharing Market." *Forbes*, April 11, 2018. https://www.forbes.com/sites/ywang/2018/04/11/didi-chuxing-faces-stiff-competition-in-race-to-dominate-chinas-ride-sharing-market/#dc93cf54a1e5.

[67] Sarwant Singh. "Give Way Uber, DiDi Signals Its Ambitions and They Encompass Wheels on Every Continent." *Forbes*, January 30, 2018. https://www.forbes.com/sites/sarwantsingh/2019/01/30/give-way-uber-didi-signals-its-ambitions-and-they-encompass-wheels-on-every-continent/#7933f896350f

[68] As of July 31, 2020, 71% of Tinder's outstanding subscriptions were from users ages 18-29, according to data from Tinder. A 2019 Pew Research survey found that for 58% of Americans in this age group, most of their online activity was through a smartphone. This number includes 22% of users who own a smartphone but do not have a high-speed internet connection at home. (Monica Anderson. "Mobile Technology and Home Broadband 2019." June 13, 2019. https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/.)

[69] The cost of a one-month subscription of Tinder Plus is $13.49 through the web browser and $14.99 through the iOS app and the cost of a one- month subscription of Tinder Gold is $40.40 through the web browser and $44.99 through the iOS app. (Prices are for a 35-year-old male located in New York City, collected in August 2020).

[70] Data from Tinder for August 2020.

require it to behave in a non-exclusionary fashion? To address this question, I consider the specific mechanisms through which Apple exerts the App Store's dominance and the potential resulting harm to sellers and consumers. As Apple has, for now, chosen not to compete in the dating service market—unlike music, in which Apple Music competes with Spotify, adding the extra dimension of self-preferencing—I focus here on the more straightforward question of how Apple's exclusionary conduct affects Tinder rather than the entire market for digital dating services.

4.1 Welfare Considerations: Prices and Innovation

Apple excludes competing app distribution channels from iOS and payment processors on apps, and to charge a 30% commission on App Store sales (app and in-app purchases) - a commission that is excessive for certain developers. This 30% commission directly results in higher prices for consumers and leads to less innovative products, as developers are left with less revenue for R&D.

Apple claims that its commission is warranted in part due to the costs it bears in providing the App Store's services. "Apple's commission… reflects the value of the App Store as a channel for the distribution of developers' apps and the cost of many services – including app review, app development tools and marketing services – that make the App Store a safe and trusted marketplace for customers and a great business opportunity for developers…"[71] However, it has been more than a decade since the App Store launched, and it seems likely that Apple has more than recouped the initial startup costs associated with R&D and architectural development necessary for the launch of the App Store. Generally, competitive constraints result in price competition and the reduction of prices to levels that better reflect average costs.[72] There is no evidence that Apple's costs of distribution, which are limited to the downloading of apps and the processing of payments, have increased over the past decade. In fact, in most marketplaces, innovation—which Apple claims it has maintained despite not facing direct competition to spur it on—leads to a *reduction* in prices from efficiency gains as the technology improves and third parties provide services in which they specialize. The fact that Apple continues to charge the same 30% commission despite its marginal costs likely falling and a decreased need to cover fixed costs, taken in conjunction with Apple's market power with respect to the App Store, suggests that the 30% commission is excessive relative to the rate that would be expected in a competitive market. In addition to its 30% commission, Apple collects $99 per year from all developers who join the Apple Developer Program, a requirement for distributing apps on the App Store.[73] This annual fee helps cover the costs of running the

[71] Letter of Kyle Andeer to Subcommittee on Antitrust, Commercial and Administrative Law of the Committee on the Judiciary. (February 17, 2020):2. https://docs.house.gov/meetings/JU/JU05/20200117/110386/HHRG-116-JU05-20200117-SD004.pdf.
[72] Competitive constraints may also result in quality competition and increased investments in innovation. There is no evidence that Apple has invested in App Store innovation commensurately with its App Store revenues.
[73] Apple. "Choosing a Membership." https://developer.apple.com/support/compare-memberships/.

App Store.

Furthermore, Apple's App Store does not provide individual developers the same value it may have provided in its early years following its 2008 launch. A former Apple executive noted that when Apple initially developed the App Store and implemented its 30% commission, "there was far less pushback from app developers, in part because the App Store was so nascent and the digital transactions were complicated without Apple's help."[74] Over time, however, digital marketplaces have proliferated, and the services the App Store provides have become more common. "[N]ow, those kinds of tools are a dime a dozen," the same executive added. Yet, the commission has remained the same, 30%.

One direct effect of the App Store's commission being unconstrained by competition is higher prices to consumers, as in some cases a portion or all of the commission that is charged by Apple to developers is passed on to consumers. Pricing data on digital goods provides evidence of this price pass-through. Tinder is an example of an app that allows consumers to make purchases through native apps on smartphones (such as its iOS app) as well as through web browsers. While the App Store charges Tinder 30% for end-user purchases of digital goods on the App Store (or 15% for subscriptions renewed past the first year), there is no such fee for purchases made through a web browser.[75] As a direct result of the 30% commission on App Store sales, Tinder charges higher prices on App Store sales than it does on sales made through web browsers. As shown in Figure 5, Tinder's prices are consistently 11-17% higher on iPhones than they are on web browsers.

Figure 5: Prices of Tinder Products on Web Browser vs. iPhone[76]

Tinder Product	Price on Web Browser	Price on iPhone	% Price Increase on iPhone
Tinder Gold Subscriptions			
1 month subscription of Tinder Gold	$40.49	$44.99	11%
3 month subscription of Tinder Gold (per month)	$22.50	$25.00	11%
6 month subscription of Tinder Gold (per month)	$15.00	$16.67	11%
Tinder Plus Subscriptions			
1 month subscription of Tinder Plus	$13.49	$14.99	11%
3 month subscription of Tinder Plus (per month)	$9.25	$10.33	12%
6 month subscription of Tinder Plus (per month)	$6.37	$7.08	11%
Boosts			
1 boost (per boost)	$5.99	$6.99	17%
5 boosts (per boost)	$5.40	$6.00	11%

[74] Jack Nicas. "How Apple's 30% App Store Cut Become a Boon and a Headache." *The New York Times*, August 15, 2020. https://www.nytimes.com/2020/08/14/technology/apple-app-store-epic-games-fortnite.html.
[75] Purchases through a web browser are subject to a payment processing fee. Payment processing fees for popular payment options such as credit cards and PayPal are typically 1-5% of the transaction value, plus a small, fixed fee, which is much less than the 30% commission charged by Apple.
[76] Prices shown are for a 35-year-old male located in New York City in August 2020.

10 boosts (per boost)	$4.50	$5.00	11%
Super Likes			
5 super like (per super like)	$1.40	$1.60	14%
25 super likes (per super like)	$1.08	$1.20	11%
60 super likes (per super like)	$0.90	$1.00	11%

Other examples of top grossing apps on the App Store that charge higher prices on App Store sales than on sales made through a web browser include Candy Crush, YouTube, YouTube Music, Amazon Music, Pandora, Twitch and Facebook,[77] indicating the increased price to consumers due to Apple's commission.

In addition to higher prices, Apple's market power also stifles developer innovation. Apple's 30% commission reduces developer's gross margin as: (i) developers may not pass on the entirety of Apple's 30% commission, and (ii) any price increases that are passed on to consumers result in fewer app and in-app purchases. The reduction in margins diminishes the amount that developers can invest in innovation, research and development, and other quality enhancing investments. A 2017 study found that an increase in corporate tax rates—functionally similar to Apple's excessive commission—reduces firm spending on R&D and results in fewer patents and product releases, both key measures of innovation.[78]

Furthermore, Apple's 30% commission reduces the scope of services that developers can offer. Specifically, it forecloses apps with digital service offerings that have high costs of goods sold. ClassPass's recent retraction of virtual workout classes is a prime example of this foreclosure. ClassPass has an app for consumers to book exercises classes at different gyms, a category of service involving a "physical good" for which Apple does not charge its 30% commission. However, when ClassPass attempted to innovate for consumers in response to the COVID-19 pandemic's restrictions on gyms by introducing virtual classes, Apple informed ClassPass that the 30% commission would be applied to this new offering.[79] ClassPass removed the virtual class option and stated that, "[honoring the commission] would require price increases that would dramatically reduce demand for these classes."[80] In this representative case, Apple's 30% commission deprived consumers of a class of digital goods that would have been able to exist but for Apple's anticompetitive behavior and unconstrained 30% commission.

[77] Prices from a 35-year-old male located in New York City in August 2020.
[78] See, e.g., Abhiroop Mukherjee, Manpreet Singh, and Alminas Žaldokasa. "Do corporate taxes hinder innovation?" *Journal of Financial Economics* 124, no.1, (April 2017).
[79] Jack Nicas and David McCabe. "Their Businesses Went Virtual. Then Apple Wanted a Cut." *The New York Times*, July 28, 2020. https://www.nytimes.com/2020/07/28/technology/apple-app-store-airbnb-classpass.html.
[80] Jon Porter. "Airbnb shared antitrust concerns with lawmakers after App Store standoff." *The Verge*. July 28, 2020. https://www.theverge.com/2020/7/28/21345134/airbnb-classpass-apple-app-store-30-percent-comission-policy-lawmakers-house-antitrust.

4.2 From Price to Value Proposition: Bundled Services and Foreclosed Alternatives

Apple uses its platform power to exclude competition in iOS app distribution and mandates that developers use the distribution and payment processing functionality of its App Store. It is worth restating that Apple's tying of its App Store to iOS is not a technological necessity but rather a strategic and unilateral choice (Jacobides & Lianos, 2021). The foreclosure of competition for distribution and payment processing allows Apple to charge a 30% commission on app revenue to certain developers. Developers must accept this commission in order to distribute through the App Store, irrespective of the value they receive from Apple. This is demonstrated by the limited promotional value Tinder receives from the App Store, despite being compelled to share 30% of all sales through its app with Apple. The Foreclosure of competition and Apple's 30% commission prevent developers from offering lower prices and higher quality apps. The excluded competition is most impactful for larger apps such as Tinder that have developed their own payment systems and do not need the App Store's promotional services. The challenge here is that app developers like Tinder are being charged for, in essence, a bundle they do not require and for a fee to which they certainly would not agree if not for the foreclosure of alternatives. In this section, I focus on Apple's imposition of a bundle and foreclosure of alternatives in app distribution in general and payments in particular.

4.2.1 Lackluster Promotion

By way of background, it may be worth noting that, despite its status as a digital service, Tinder historically depended on offline advertising to develop consumer awareness and build its brand. Offline marketing was especially important to Tinder's rise in popularity in its early days. Examples of Tinder's early marketing variously included targeted visits to campus sororities and fraternities (having sorority members install the app first was effective in getting fraternity members to sign up as well);[81] campus parties which required a download of the Tinder app for entry;[82] and viral stunts that led to significant word of mouth advertising.[83] These offline marketing activities were responsible for much of Tinder's early user growth.[84] As late as 2015, 97% of Tinder's marketing spend was on offline channels.[85] And Tinder has continued to invest heavily in offline marketing:

[81] Morgan Brown and Everette Taylor. "What Ignited Tinder's Explosive Growth?" *Growth Hackers.* https://growthhackers.com/growth-studies/what-ignited-tinders-explosive-growth.
[82] Alyson Shontell. "Founder of $3 billion Tinder reveals the clever marketing tricks he used to make the app go viral." *Business Insider*, February 15, 2017. https://www.businessinsider.com/how-tinder-went-viral-sean-rad-reveals-app-marketing-tricks-in-podcast-2017-2.
[83] Jesse Michels and Sunil Rayan. "How to grow your app." *TechCrunch*, December 26, 2016. https://techcrunch.com/2016/12/26/how-to-grow-your-app/.
[84] See, e.g., Morgan Brown and Everette Taylor. "What Ignited Tinder's Explosive Growth?" *Growth Hackers.* https://growthhackers.com/growth-studies/what-ignited-tinders-explosive-growth and Alyson Shontell. "Founder of $3 billion Tinder reveals the clever marketing tricks he used to make the app go viral." *Business Insider*, February 15, 2017. https://www.businessinsider.com/how-tinder-went-viral-sean-rad-reveals-app-marketing-tricks-in-podcast-2017-2.
[85] Tinder marketing data.

since 2015, Tinder's total offline marketing spend was more than 50% greater than its online marketing spend.

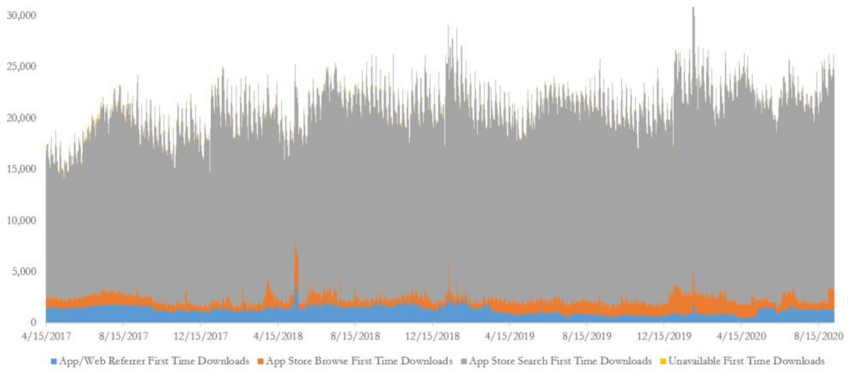
As part of the arrangement of the App Store, Apple offers marketing services to justify its App Store fees.[86] This is a bundled service, which is offered regardless of the appetite of companies to consume it or of their expected benefit. And while undoubtedly many developers benefit from the promotion and distribution offered by the App Store, which help consumers find their apps, the benefits are far from universal. As has been noted regarding typical search patterns in the App Store, "users find out about apps in a number of ways when using their smartphones, for instance through advertising on social media, watching a YouTube video, or through general search on their mobile device" (Voelcker and Baker: 91). This is why, "developers target app users (including iOS users) outside their OS environment, e.g., through marketing campaigns on social media, on the developer's website, or through other advertising channels where the target audience can be reached" (Voelcker and Baker: 91).

The limited value of promotion and distribution by the App Store for major developers is highlighted by consumer navigation patterns to Tinder. More than 88% of attributable first-time downloads of Tinder between April 2017 and August 2020 came from App Store searches, while only 6% came from App Store browsing and the remaining 6% came from referrals from other apps or websites.[87] See Figure 6. During this time period, first-time downloads from App Store search have consistently been much higher than first-time downloads from App Store browsing.

[86] Apple has stated its fees are for "app review, app-development tools, and marketing services." Matt Smith. "There's a Fight Raging Over Apple's App Store. Why Some Regulators and Developers Are Calling It a Monopoly." *Barron's*, March 6, 2020. https://www.barrons.com/articles/apple-app-store-developers-are-pushing-back-on-apples-power-51584700200

[87] From App Store data for Tinder. Apple reports first time downloads as app units. Percentages exclude first time downloads for which the referral source was unavailable (less than 0.5% of app units were unattributable).

Figure 6: Tinder App Units by Referral Source[88]



While Apple does not provide Tinder with data on search terms in the App Store, search terms used to find apps can demonstrate consumer intent and perceptions of Tinder.[89] In the absence of App Store search terms, data on organic search terms resulting in visits to the Tinder webpage demonstrate the importance and strength of Tinder's brand. Data from Google Analytics show that more than 97% of the visits to the Tinder webpage resulting from organic search between August 2018 and August 2020 were navigational searches involving the word "Tinder."[90] See Figure 7 for a list of the top ten search queries that resulted in visits to the Tinder webpage.

Figure 7: Top 10 Search Queries resulting in Visit to Tinder Webpage[91]

Search Query	Clicks ('000s)	Percent of Total Clicks
Tinder	135,662	86.4%
tinder login	1,577	1.0%
tinder.com	944	0.6%
tinder app	876	0.6%
tinder online	631	0.4%
tinder web	553	0.4%
Tender	542	0.3%

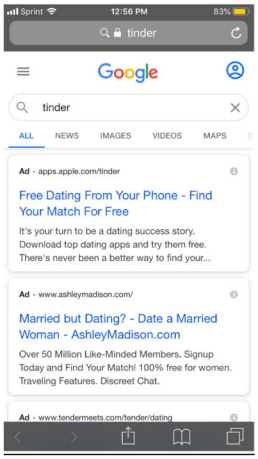
[88] Tinder data from the App Store. Note that Apple likely had a data issue in March 2019 which caused first time downloads to be reported incorrectly. Data from that week have been removed from the chart.
[89] The Voelcker and Baker report notes, "when users search for apps using App Store search, they are typically looking for a specific app to suit their purposes. This means that search terms will frequently include the name of the app (including the brand name) itself. Indeed, it is estimated that a significant majority of search queries are 'branded'" p. 89.
[90] From Google Analytics data for Tinder. Includes misspellings of "tinder," such as "tender" or "timder."
[91] From Google Analytics data for Tinder. Table includes only search terms in the Latin alphabet. Search terms with characters not in the Latin alphabet comprised 3% of total clicks. It is likely that some of these searches were navigational queries for tinder in a different language.

Search Query	Clicks ('000s)	Percent of Total Clicks
tinder entrar	370	0.2%
Timder	338	0.2%
tinder uk	239	0.2%

The data suggests that Tinder receives limited promotional value from the App Store despite the substantial share of each sale it is forced to share with the platform.

Apple's own behavior further proves that Tinder's brand is far more valuable for obtaining users than Apple's promotion within the App Store. To drive sales of apps through the App Store, Apple purchases search ads on Google for keywords associated with popular apps. For example, consumers who search on Google for "Tinder" within a browser application on their iPhones may intend to visit and sign up for Tinder through the Tinder webpage. However, Apple purchases search ads that appear at the top of the search results page. These ads direct consumers to the App Store page for Tinder, rather than to the Tinder webpage.

Figure 8: Apple App Install Ad for Search Term "Tinder"



Apple's interception and redirection of the small share of consumers who search for the Tinder website has several impacts. Among these, it inflates the estimated promotional benefit Apple can report. Furthermore, this competes with Tinder's (lower cost) distribution channel outside of the App Store, cementing Apple's hold

over Tinder and other developers.

4.2.2 Foreclosure of Rival Payment Processing Systems

In addition to imposing steep charges irrespective of their return value, platforms with chokepoints on their ecosystems can extract value by excluding rival complementary services (Cusumano et al, 2019: 79). This exercise of market power is exhibited by Apple in payments.

Significant competition among payment providers has driven down transaction fees to 1-5% of the transaction value, plus a small, fixed fee.[92] These services are provided by firms such as PayPal and Stripe that specialize in payments processing and have a track record of providing payment services at large scales across industries and technologies. Yet, in an exercise of its market power, Apple prohibits such providers from servicing in-app payments for developers on apps distributed through the App Store and forbids developers from using their own payment systems as well.

Exposure to competition in payments would not only pressure Apple to reduce the App Store's commission, but to also provide developers with improved quality and innovation and to share data (e.g., credit card information) from payments with developers. Currently, Apple collects data from consumers purchasing apps or making in-app payments but does not share this data with the developers of those apps. This prevents developers from engaging in basic consumer service requests, including "refunds, credit card changes, discounts, trial extensions, hardship exceptions, comps, partial payments, non-profit discounts, educational discounts, downtime credits, tax exceptions, etc."[93] If consumers have paid or subscribed though Apple's In App Payment API (IAP), developers can only refer consumers back to Apple regarding issues with billing or refunds. This is detrimental to the consumer experience, as consumers may not immediately know who to contact to resolve billing issues. Apple's conduct also prevents iOS developers from offering consumers additional services of value, such as allowing consumers to "carry-over credits to subsequent months" or targeting consumers whose subscriptions have expired with special offers (Autoriteir Consument & Markt, 2019: 94). Furthermore, by not providing iOS developers access to key analytics about their customers, Apple deprives developers of key insights for improving their offerings

Mandating itself as an intermediary for the sale of all digital purchases associated with an app distributed through the App Store is also part of what enables Apple to treat developers as disposable. By making itself the direct broker of the sale—both the "face" of the purchase and collector of the consumer's purchasing

[92] Based on a review of transaction fees charged by payment providers, including PayPal, Stripe, Square, Visa, and MasterCard.
[93] "Our CEO's take on Apple's App Store payment policies, and their impact on our relationship with our customers," *Hey.com,* June 19, 2020. https://hey.com/apple/iap/.

information—Apple weakens the relationship developers have with customers.

Apple's exclusionary conduct also affects competition downstream in apps. By mandating itself as the sole payment processor for in-app payments on apps distributed through the App Store and thus obtaining privileged access to consumer data, Apple has a competitive advantage as an app developer. Additionally, because it controls iOS, Apple can monitor how much time users spend on specific apps, information that regular developers lack. This additional information gives Apple an advantage in services in which Apple already competes (e.g., music, news, weather) as well as services in which it may compete in the future—such future services may include new apps designed or launched based on the insights Apple gains from its unique trove of consumer data. Apple's competitive advantage as a result of its privileged access to consumer data is substantial before even considering other acts that disadvantage regular developers, such as Apple's pre-installation of its own apps on iOS and preferencing of them in search results in the App Store.[94]

Apple's in-app purchasing mandate also exacerbates consumer lock-in by making it more difficult for consumers to multi-home or switch operating systems. Consumers cannot use a subscription purchased through Apple's In-App Purchases on their iOS device simultaneously on an Android device (e.g., a Samsung tablet). Furthermore, when transferring app subscriptions purchased on an iOS device, consumers have to cancel their subscriptions and wait for that subscription to expire before they can re-subscribe to the app on their new operating system.[95] This becomes especially onerous when consumers have multiple different subscriptions for different apps with different subscription end dates.

While Apple may claim that the restriction of third-party payment systems is to provide users with better security, Apple does not mandate the use of its in-app purchasing system for transactions involving physical goods or services. The rationale for an Uber ride, Airbnb home booking, or Target delivery requiring less security than the purchase of a good Apple classifies as purely digital is unclear. Furthermore, on Mac computers, Apple does not restrict app distribution to one (Apple) store or payment option, nor does it limit ancillary services to one (Apple) provider. If we take Apple at its word, should consumers feel insecure when using a Mac?

4.3 A Pattern of Growing Dominance: Tightening the Screws on Developers

[94] Apple's apps ranked first in more than 60% of basic searches in the App Store, according to data from App Annie. Tripp Mickle. "Apple Dominates App Store Search Results, Thwarting Competitors." *Wall Street Journal*, July 23, 2019. https://www.wsj.com/articles/apple-dominates-app-store-search-results-thwarting-competitors-11563897221.

[95] See, e.g. "Our CEO's take on Apple's App Store payment policies, and their impact on our relationship with our customers." *Hey.com*, June 19, 2020. https://hey.com/apple/iap/. See also, e.g., Hulu. "Switch plans and manage add-ons." August 24, 2020. https://help.hulu.com/s/article/manage-subscription?language=en_US#itunes.

To understand the forces behind Apple's platform power as well as the platform's instruments to abuse its power, it helps to trace the evolution. When the App Store launched in 2008, Apple had yet to foster the conditions and gain the control that would later give rise to a unique level of dominance. The App Store's power grew incrementally. In the years following 2008, we can observe a pattern in Apple's treatment of developers, consistent with that found in other research such as Rietveld et al. (2020), which shows how the App Store's governance changed from initially nurturing conditions that helped developers (e.g., to better monetize) to imposing rules with redistributive effects in favor of the platform (i.e., itself).

In 2010, for example, after achieving success with the App Store following its launch, Apple imposed restrictions on the programming languages and tools developers could use on iOS, limiting languages to those native to iOS and developer tools to a small set it sanctioned.[96] Concerned Apple's conduct could harm competition, the Federal Trade Commission opened an investigation. Apple, in turn, reversed course and removed the restrictions.[97] As its power grew, however, Apple embarked on bolder exclusions. In 2011, Apple restricted developers from directing consumers outside of an iOS app to make payments.[98]

In subsequent years, Apple's exercise of its dominance over developers expanded, and Apple launched its own downstream services, giving its apps advantages over existing offerings from non-Apple developers.[99] For example, before and after the release of Apple Music, in 2016, Apple introduced a series of rules and hardware limitations that hindered the incumbent Spotify. Among other impediments, Apple dismissed Spotify's efforts to integrate with the Apple Watch; it restricted Spotify from using terms such as "free" on its promotion page in the App Store, only to do so itself for Apple Music; and it gave Spotify second billing to Apple Music on Siri, defaulting to its own (less established) service when consumers requested a song without specifying the streaming service for its delivery.[100] More recently, in gaming, Apple introduced a number of restrictions starting in late 2017—affecting then-market leaders, such as Stadia and Steam Link—in the period prior to its launch of Apple Arcade. Among other anti-competitive conduct, Apple prevented developers from "executing" their apps through the cloud, blocking some of the most innovative new offerings (and, specifically, those diminishing the centrality of the iPhone hardware in the performance of games) ahead of Apple's debut in the

[96] "Regulators Mull Antitrust Look at Apple: source." *Reuters*, May 3, 2010. https://in.reuters.com/article/us-apple-antitrust/regulators-mull-antitrust-look-at-apple-source-idUSTRE6425JE20100503.
[97] "Regulators Mull Antitrust Look at Apple: source." *Reuters*, May 3, 2010. https://in.reuters.com/article/us-apple-antitrust/regulators-mull-antitrust-look-at-apple-source-idUSTRE6425JE20100503.
[98] "Apple on Sony Reader: "We Have Not Changed Our Guidelines." *All Things Digital*, February 1, 2011. http://digitaldaily.allthingsd.com/20110201/apple-on-sony-reader-we-have-not-changed-our-guidelines/ and Anthony Ha "Subscriptions put Apple in Antitrust Spotlight Again" *VentureBeat,* February 17, 2011. https://venturebeat.com/2011/02/17/apple-subscriptions-antitrust-investigation/.
[99] One key advantage was favorable placement in search rankings. See, e.g., Jack Nicas and Keith Collins. "How Apple's Apps Topped Rivals in the App Store It Controls." *The New York Times,* September 9, 2019. https://www.nytimes.com/interactive/2019/09/09/technology/apple-app-store-competition.html.
[100] Time to Play Fair (Spotify). "A Timeline: How We Got Here." https://timetoplayfair.com/timeline/.

market.[101]

After walking back some of its initial attempts to exercise and strengthen its market power in 2010 in the face of regulatory opposition, Apple would soon be less inhibited in its exclusionary conduct and eventually play in markets with risks of favoritism of its own apps. Compared to leading platforms in other digital marketplaces, Apple stands out for its increasingly restrictive conduct, having implemented the most changes "specifically aimed at the platform's value appropriation (e.g., giving preferential treatment to own apps; banning external apps that compete with iOS functionality)" (Rietveld et al., 2020). This conduct is explained by Apple's incentive to use its platform power not only to extract additional surplus from developers but also to weaken competitive threats. Today, as some of the world's most popular and otherwise powerful developers attempt to rebuke Apple's dominance, the platform feels little competitive pressure to consider changing the terms of its relationship with these complementors.

The concessionary steps Apple has taken appear to only reinforce its power and ability to control the terms of its relationship with developers. In its most recent display of comity, Apple, as of January 2021, has committed to reducing its App Store commission to 15% for developers that earn $1 million or less annually.[102] Apple hit the right notes, labelling its new policy the "App Store Small Business Program" and framing it as a boon to developers in the face of the economic challenges created by COVID-19.[103] However, when its impact and design are considered, Apple's new pricing policy appears less as a response to competitive pressure and more as an internally-determined concession to gain public favor. The portion of App Store revenue touched by this policy is minor in relative terms: the developers who will qualify accounted for less than 5% of App Store revenue last year; specifically, around $780 million of Apple's total revenue of $14.8 billion from the Apple Store.[104] Second, the policy's design belies its non-market driven thrust. By setting a revenue cliff for developers at which their commissions increase—rather than different marginal rates—the new pricing policy effectively punishes developers whose earnings are just above the threshold. I.e., it will charge 30% to a developer earning $1,000,001 annually and 15% to a developer earning $1,000,000 annually. Furthermore, although seemingly magnanimous, a reduction for small developers is at odds with what would be expected in a competitive market, in which large sellers receive volumes discounts due to their greater bargaining power and generally lower cost to service due to economies of scale. Lastly, and most fundamentally, the reduced commission does not address

[101] "Apple Just Created Insane Rules for Cloud Gaming on iPhone." *ExtremeTech,* September 11, 2020. https://www.extremetech.com/gaming/314918-apple-just-created-insane-rules-for-cloud-gaming-on-iphone and "Cloud gaming service Shadow has been removed from the App Store for violating guidelines." *iMore,* February 27, 2020. https://www.imore.com/cloud-gaming-service-shadow-has-been-removed-app-store-violating-guidelines.
[102] The qualifying threshold is determined by earnings in the previous calendar year and is applied to earnings after Apple's take is applied – i.e., a developer that earned $1.15 million in 2020 would qualify for the lower commission.
[103] "Apple announces App Store Small Business Program." Apple Newsroom, November 18, 2020. https://www.apple.com/newsroom/2020/11/apple-announces-app-store-small-business-program/.
[104] Estimates based on data from Sensor Tower.

the absence of competition imposed by Apple and its exclusionary conduct that harm developers and consumers in myriad ways.

4.4 Controlling the Future: As Smartphones Become Less Differentiated, Apple's Business Model is Shifting Towards Services

The competitive landscape in mobile hardware is changing. In prior years, Apple's supply chain and the design, functionality, and features of its devices were highly differentiated. However, the supply chains of device makers, largely centered in Asia, are increasingly replicable. Furthermore, after years of continually releasing new features and functionalities (e.g., screen resolution and connectivity), there may be a ceiling to what premium smartphones can offer above and beyond the lower- and mid-tier devices nipping at their heels.[105] And the performance of premium and more modest devices could converge further as an increasing share of the workload behind applications is managed on the cloud, diminishing the role of mobile devices in the delivery of the service.

Consistent, if subtly, with this trend, iPhone unit sales have been declining since 2015[106] and profit margins have declined from around 75% to 60% in the past ten years.[107] Although the iPhone still stands as the centerpiece of the tech giant's business, with sales and margins that remain enviable, revenue for Apple appears to be shifting towards services. As a percentage of Apple's total revenue, hardware revenue decreased from 63% to 44% percent from Q3 2015 to Q3 2020[108] and software and services revenue increased from 10% to 22% percent in the same time frame.[109]

Apple has likely recognized the trend toward the commoditization of smartphone hardware as well as the previously described growing prominence of ecosystems and the product-service bundles they foster. At least Apple's behavior suggests as much, as Apple has positioned itself not just to be the centerpiece of product-service bundles, but to control the ecosystem and the structure of the bundle.

4.5 Bottom Line: The Need to Apply the "Special Responsibility" Doctrine to Gatekeepers (or, Why Apple's Successful Strategy Needs to Stop Resting on Anticompetitive Behavior)

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[105] As recently noted, "We may have reached 'peak screen' for the general population, such that bolstering the current resolution, color accuracy, brightness, and refresh rates beyond current levels won't matter to most people." (Jeremy Horwitz. "Specs are Android's biggest advantage over iPhones, but do users care?" *VentureBeat*, February 17, 2020. https://venturebeat.com/2020/02/17/specs-are-androids-biggest-advantage-over-iphones-but-do-users-care/.)

[106] David Gewirtz. "iPhone Unit Sales Have Been Declining Steadily for 5 years." *ZDNet*, September 2, 2020. https://www.zdnet.com/article/heres-an-interesting-chart-iphone-unit-sales-have-been-declining-steadily-for-five-years/.

[107] Omar Sohail. "Apple's iPhone Profits Have Actually Been Declining Despite the Era of $1,000+ Devices, According to the Latest Chart." *Wccftech*, Nov 15, 2018. https://wccftech.com/apple-iphone-profits-declining/.

[108] "iPhone Revenue as a Share of Apple's Total Revenue." Statista. https://www.statista.com/statistics/253649/iphone-revenue-as-share-of-apples-total-revenue/.

[109] "Services Revenue as a Share of Apple's Total Revenue." Statista. https://www.statista.com/statistics/1101212/services-revenue-as-share-of-apples-total-revenue/.

Our analysis demonstrates that Apple has the unique privilege of platform power over developers in the iOS ecosystem. Possessing the special position, Apple employs hard-ball tactics that are likely to restrict competition and reduce welfare.

Apple's general defense is that it operates a closed ecosystem to control the customer experience. Foreclosure of rival payment systems is part and parcel of both the customer experience and the stability of the system, it contends. Yet the most recent debate is not about whether in-app payments should be allowed (they are now structured as modular components that do not undermine the iOS integrity) but whether a tax should be applied. So, Apple's defense of yesteryear, that it is safeguarding the user experience, does not seem to apply. Rather, Apple appears to be cultivating a position of strength, from having built an (ever-expanding) ecosystem with significant lock-ins and abusing this position of power. The specific case of how Apple is able to treat one of the most successful apps in both its ecosystem and the Android ecosystem should remind us that gatekeepers have extraordinary power—and should carry commensurate responsibility. We should also not expect that self-interest alone will check Apple's anti-competitive behavior. Unfortunately, the very aspects that make Apple a strategically powerful firm—its intimate customer knowledge, its ability to create lock-in, its scale and own network effects—are also those which give rise to its anticompetitive impacts.

Much of Apple's success, to be sure, is based on its merits: from the ingenuity of its designers and software engineers, to its successful ecosystem management and product design. There is little doubt that a regulatory intervention may risk undermining some of the benefits that consumers enjoy, as some options would no longer be available (Dolmans and Pesch, 2019 or Crémer, de Montjoye, and Schweitzer, 2019). But this is a price that may well be worth paying in the short run, as Apple is now using its position without regard to the obligations it entails. Regulators should be swift and decisive. Exclusionary conduct such as mandating the use of its own payment system on iOS apps is hard to justify, and for many developers the 30% commission is unjustified. The difficulty of finding an effective regulatory regime does not imply that solutions do not exist. In the world of patenting, the practice of obligatory licensing of "Standard Essential Patents" under FRAND rules has, within a few years, become standard practice; and in the world of telecommunications regulation, there is a well-established regime for dealing with settings whereby network externalities are paramount.[110] Regulators and society have reacted in the past to new challenges; with changes in either production economics or inter-organizational relations, new approaches have been devised.

We are currently witnessing a transformation of the way economies are structured and of how sectoral architectures are set. The ability of firms to shape the rules, roles, and relationships, including those that operate

[110] See, e.g., "FRAND, RAND, and SEP: Why These Acronyms Are Important." *Technology | Academics | Policy*. February 12, 2013. https://www.techpolicy.com/Blog/February-2013/FRAND,-RAND,-and-SEP-Why-These-Acronyms-Are-Import.aspx

within platforms and ecosystems, are becoming paramount for their success (Jacobides et al, 2006; Jacobides, 2019). But this also leads to new regulatory concerns. Those who have spent years studying the underpinnings of Big Tech's success for valuable lessons have in recent years taken to exhorting gatekeepers to realize their immense power and exercise self-restraint before their powers reach a tipping point (Iansiti & Lakhani, 2018). With that message largely unheeded, once we identify firms with bottleneck power and do not see behavior consistent with the "special responsibility not to exploit," we need to act, and swiftly.

5. Concluding Thoughts

One of the greatest challenges of the platform economy is that the complexity of its economics and underlying technology may lead to confusion and regulatory inaction, for fear of interfering with innovation. This is especially challenging because it can be hard to disentangle competition on merits from a dominant position. Yet, given the asymmetrical power structures that digital platforms entail, regulatory inaction can have a very heavy price. We need to identify some simple, collectively agreed upon principles for establishing platform power and then consider what are the anti-competitive conducts and outcomes that require recourse. This paper offers such a framework—simplified—to assess platform power and to raise questions that regulators should consider.

In the case of Apple's market power, the scale and variety of apps on the App Store can distract from Apple's restrictive conduct towards these apps and their developers. For many app developers, the 30% commission is a steep charge relative to the value of services delivered by Apple. As demonstrated, opting out of iOS is not a commercially viable option for many developers. Apple's excessive commission on iOS apps results in higher prices and can stifle service quality, diversity, and innovation for consumers. An examination of other digital marketplaces highlights the benefits of competition among platforms. Rival platforms in PC gaming and live streaming push each other to price competitively and maximize innovation. They also remind us not to take for granted the architectural decisions that Apple has made strategically and unilaterally (Jacobides & Lianos, 2021)—the tying of an operating system with the distribution of services optimized for that operating system is not a necessity of the underlying technologies.

The precise regulatory measures for addressing the market power of platforms like the App Store and iOS and enabling competition are beyond the scope of this paper. However, it is worth noting two common themes of reform, beyond those related to the issue of pricing (the 30% commission) and the need to justify it when a firm is a gatekeeper. These are i) restricting exclusionary conduct and self-preferencing, and ii) increasing data access and mobility.

Limiting exclusionary conduct and self-preferencing. Earlier regulatory responses to the abuse of market

power by platforms tended to focus on exclusionary conduct in complementary services. For example, Apple's platform role falls into two scenarios that the German government described as requiring greater regulatory oversight and intervention: first, its exclusionary conduct in payments services; second, offering its own apps in competition with apps from rivals (Schallbruch, Schweitzer & Wambach, 2019, pg. 50-51). These conducts are difficult to undo given the dynamics of platform marketplaces: demand for the service, initially contrived, becomes perpetuated by a captive user base and their data. The Digital Markets Act, in a strict interpretation and implementation of its interventions, would go further, proscribing the tying-in of ancillary services in general (i.e., potentially more than just payment processing) and exclusive app distribution[111] (i.e., third-party app stores).

Data access, portability, and interoperability. As data is a key asset that can tip marketplaces into the hands of a leading platform, data access and portability have been at the center of some proposals for promoting competition, such as those discussed in Schallbruch, Schweitzer, and Wambach (2019), Dolmans and Pesch (2019), Crémer, de Montjoye, and Schweitzer (2019), Kimmelman (2020), and the DMA. These solutions include requiring platforms to share data with their business users (e.g., developers) and competitors or to submit data to a third-party serving as a data "trust." Here, the DMA obligates gatekeepers not just to share data but to do so without obstructions: gatekeepers would be required to grant developers access to data about developers' sales, customers, and other commercial activity "free of charge" and in a manner that is "high in quality, continuous and realtime." These solutions also call for platforms to ensure data portability by capturing and storing user data in interoperable formats that enable consumers to transfer their user information to other platforms with minimal friction.[112] These requirements facilitate consumer switching and multi-homing in support of consumer choice. These proposals stipulate the need for accompanying measures to ensure privacy and security safeguards. Although powerful platforms tend to raise the specter of privacy breaches in defense of their closed systems and refusal to deal—look no further than Apple's newest marketing campaign[113]—rules requiring platforms to share data and make it more transferable need not undermine privacy protections (Kimmelman, 2020).

Although less widely adopted, another intervention is to resolve the fragmentation that weakens the bargaining

[111] Is it important to note, given that this proscription would disarm the foundation of the App Store's platform power, that this obligation falls under the DMA's Article 6, which, as currently proposed, would not be automatically imposed but rather subject to negotiations with the gatekeeper. Furthermore, the relevant clause includes the potentially defanging caveat that gatekeepers would be allowed to take measures to prevent third party app stores from taking actions that "endanger the integrity of the hardware or operating system provided by the gatekeeper."

[112] See, for example: Jacques Cremer, Yves-Alexandre de Montjoye, and Heike Schweitzer. "Competition Policy for the Digital Era." European Commission Directorate-General for Competition. (2019):6; "A New Competition Framework for the Digital Economy." Federal Ministry for Economic Affairs and Energy, Germany. September 2019 and "Unlocking Digital Competition." Report of the Digital Competition Expert Panel, United Kingdom. March 2019.

[113] Rishi Iyengar. "Apple's New iPhone Ad Puts Privacy Front and Center Again." *CNN*, September 3, 2020. https://www.cnn.com/2020/09/03/tech/apple-iphone-privacy-ad/index.html

power of businesses that have come to depend on platforms. The Australian competition authority, for example has intervened to address the disparity between platforms and media companies and is developing a code of conduct that would allow media companies to engage in collective bargaining to counter the stronger bargaining position of platforms.[114]

Developers faced with Apple's market power and consumers experiencing the downstream harm may experience some relief if Apple were prevented from tying complementary services like payments to platforms like the App Store (or app distribution from iOS) and from preferencing its own apps. Data portability would increase competitive pressure on Apple by loosening its lock on consumers, although only slightly given the myriad other barriers to switching mobile devices. However, more work is required to determine the effects of these potential solutions and identify a broader set of reforms to foster competitive pressures against the App Store and dominant platforms in other marketplaces to ensure competitive prices, high quality service, and innovation for consumers.

[114] The latest draft was released on July 31, 2020 and is available here: https://www.accc.gov.au/focus-areas/digital-platforms/draft-news-media-bargaining-code.

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Appendix: How often do Consumers Switch Away from iPhones?

Section 3.1.2 demonstrates that consumers do not easily switch their iPhone "bundle" of the hardware and apps. This section details why iOS users are locked-in, for a number of reasons, explained in detail below:

1. Consumers prefer features on their existing mobile operating systems.
2. The high price of smartphones makes it costly for consumers to switch from iPhones to Android devices.
3. Transferring data and accounts across operating systems can be time-consuming and result in lost purchases.
4. Apple has created a hardware ecosystem around the iPhone that further increases switching—or, more specifically, "mixing and matching" costs.
5. Apple has introduced consumer programs—warranty, financing, and upgrade—that strengthen consumer lock-in.
6. The replacement cycle for smartphones is long (and increasing).

1. Consumers prefer features on their existing mobile operating systems. A 2019 Consumer Intelligence Research Partners (CIRP) study of consumers in the U.S. found that 91% of iOS users upgraded to another iPhone,[115] and other surveys show similarly low rates of OS switching.[116]

2. The high price of smartphones makes it costly for consumers to switch from iPhones to Android devices. The high price of smartphones makes it cost prohibitive for consumers to easily switch smartphone operating systems. The average price of a consumer smartphone in the U.S. in 2019 was $528.[117]

3. Transferring data and accounts across operating systems can be time-consuming and result in lost purchases. Many consumers develop a certain level of familiarity with the functionality of their existing operating system and may find that learning how to use a new operating system poses a barrier to switching.[118]

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[115] Ben Lovejoy. "iOS and Android loyalty levels higher than ever, Android just ahead for now." January 28, 2019. https://9to5mac.com/2019/01/28/ios-android-loyalty/.; "iPhone Scores 92% Loyalty Rate in Recent Survey Ahead of iPhone 8." Mac Rumors, 2017, May 17. https://www.macrumors.com/2017/05/17/iphone-92-percent-loyalty-rate-survey/.

[116] A 2017 Morgan Stanley survey of adults in the U.S. found that 92% of iPhone owners that are likely to upgrade their phone in the next 12 months plan to purchase another iPhone ("iPhone Scores 92% Loyalty Rate in Recent Survey Ahead of iPhone 8." Mac Rumors, May 17, 2017. https://www.macrumors.com/2017/05/17/iphone-92-percent-loyalty-rate-survey/; "92% of iPhone users likely to upgrade in the next 12 months," AppleWorld Today, May 17, 2017). A 2019 SellCell survey of adults in the U.S. showed that 91% of iPhone users intend to buy another iPhone when they upgrade. ("iPhone vs. Android – Cell Phone Brand Loyalty Survey 2019." Sell Cell, August 20, 2017).

[117] "Average price of smartphones in the United States from 2014 to 2023 (in U.S. dollars), by segment." Statista, February 28, 2020. https://www.statista.com/statistics/619830/smartphone-average-price-in-the"-us/. Top end iPhones and Samsung phones (iPhone and Samsung are the most popular smartphone brands in the U.S.; Samsung phones operate an Android operating system) can cost as much as $1,449 for the iPhone 11 Pro and $1,449 for the Samsung Galaxy Z Flip 5G. See: Samsung. "New Arrival Galaxy Z Flip 5G." https://www.samsung.com/us/mobile/galaxy-z-flip/buy/?modelCode=SM-F707UZAAATT.

[118] Susan Athey. "White Paper – Apple Pay in Australia." 2016. Yuri Park and Yoonmo Koo. "An empirical analysis of switching costs in the smartphone market in South Korea." *Telecommunications Policy* 40 no.4 (April 2016):307-318.

In addition, it can often be difficult to transfer data and accounts from iPhone to Android, especially for iPhone specific accounts such as iMessage.[119] In other instances, consumers are not able to transfer in-app purchases from Apple to Android. For example, movies, TV shows and eBooks purchased through iTunes cannot legally be copied from an Apple device to an Android device.[120] In contrast, Apple has made switching from one iPhone to another iPhone relatively seamless. Apple offers a migration feature in which consumers can simply hold their two iPhones (old and new) together and "all [their] personal information [will be] moved to the new phone, while the apps that [they] had installed [will be] downloaded directly from the App Store."[121]

4. Apple has created a hardware ecosystem around the iPhone that further increases switching costs. Individuals may prefer the convenience of having an ecosystem that allows them to easily share data across their Macs, iPads and iPhones.[122] Apple offers "Continuity" features, which "make it seamless to move between your devices."[123] There are 12 "Continuity" features listed, including (i) handoff, which allows consumers to start work on one device and pick up on another device, (ii) universal clipboard, which allows users to copy content on one device and paste it on another device, (iii) iPhone cellular calls, which allows users to make and receive calls from Macs, iPads or iPod touches, and (iv) text message forwarding, which allows users to send and receive SMS and MMS messages on Macs, iPads and iPod touches.[124] A 2017 CNBC survey showed that the average American household owns 2.6 Apple products.[125] Consumers are less likely to switch away from iPhones if they continue to use other Apple products due to the stickiness of those Apple products.

5. Apple has introduced consumer programs—warranty, financing, and upgrade—that strengthen consumer lock-in. Apple offers the iPhone Upgrade Program, in which consumers can make recurring monthly payments for AppleCare coverage (which includes technical support)[126] and a new iPhone every year.[127] Taken in conjunction with Apple's easy-to-use migration feature, it is much easier for iPhone owners to continue to use iPhone devices rather than Android devices.

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[119] Jesse Simms. "How to transfer messages from iPhone to Android?" *Ting*, June 10, 2019. https://ting.com/blog/you-asked-transferring-texts-from-iphone-to-android/.
[120] Simon Hill and Mark Jansen. "How to switch from iPhone to Android: The ultimate guide. Digital Conversion." May 27, 2020. https://www.digitaltrends.com/mobile/how-to-switch-from-iphone-to-android/.
[121] Chris Smith. "Upgrading to iPhone 11 Will Be Easier than Ever With the New Data Migration Feature in iOS 12.4." *BGR*, July 23, 2019. https://bgr.com/2019/07/23/iphone-11-upgrade-transfer-data-from-old-iphone-via-wi-fi-or-cable/.
[122] Lukasz Grzybowski and Ambre Nicolle. "Estimating Consumer Inertia in Repeated Choices of Smartphones." CESifo Working Paper No. 7434. SSRN, 2018. https://ssrn.com/abstract=3338788.
[123] "Use Continuity to connect your Mac, iPhone, iPad, iPod touch, and Apple Watch." Apple, July 24, 2020. https://support.apple.com/en-us/HT204681.
[124] "Use Continuity to connect your Mac, iPhone, iPad, iPod touch, and Apple Watch." Apple, July 24, 2020. https://support.apple.com/en-us/HT204681.
[125] Steve Liesman. "America Loves its Apple. Poll Finds that the Average Household Owns More than Two Apple Products." *CNBC*, October 10, 2017. https://www.cnbc.com/2017/10/09/the-average-american-household-owns-more-than-two-apple-products.html.
[126] "AppleCare Products." Apple. https://www.apple.com/support/products/.
[127] "iPhone Upgrade Program." Apple. https://www.apple.com/shop/iphone/iphone-upgrade-program.

6. The replacement cycle for smartphones is long and getting longer. A 2019 Deloitte survey shows that 62% of smartphone owners do not intend to get or buy a new smartphone within the next year.[128]

Due to the factors listed above, few consumers would be induced to switch mobile operating systems because of the availability (or lack thereof) of an individual application.

Furthermore, iPhones and Android devices are imperfect substitutes for each other. There are many demographic differences between iPhone and Android users. A 2018 survey of smartphone users in the U.S. shows that iPhone owners have an average salary of $53,000, over 40% higher than the average salary of Android owners.[129] iPhone owners also typically have "higher education levels, more engagement, and more spend on apps."[130] iPhones and Androids are further differentiated, which reduces competition. Apple emphasizes privacy, security and user experience while Google generally offers lower prices.

Developer behavior is further evidence that consumers do not easily switch between mobile operating systems. If consumers could easily switch between platforms to access specific applications, developers might choose to offer their apps on only one platform given the additional cost of developing for multiple platforms. While there is some debate over whether developers multi-home, this is not the case with the top apps.[131] A review of top revenue generating apps shows that the vast majority multi-home. The top revenue generating apps is appropriate because App Store revenue in the U.S. is heavily concentrated amongst the top developers: the top 1% of monetizing developers were responsible for 94% of total U.S. App Store revenue in 2016.[132]

Among the top 250 apps by revenue in Apple's App Store in the United States in 2019, 245 were available on Google Play. Among the top 250 apps by revenue on Google Play in the United States in 2019, 249 were available in Apple's App Store.[133] Voelcker and Baker's claim that "multi-homing appears to be the exception rather than the rule" (2020) is misleading as that conclusion was due, in large part, to a focus on the long-tail of applications, giving equal weight to popular apps like Facebook and small and unestablished apps[134] It is clearly not the case for the top revenue-generating apps, as shown above.

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[128] Kevin Westcot, Jeff Loucks, Dan Littman, et al. "Build it and they will embrace it." Deloitte, 2019 https://www2.deloitte.com/content/dam/insights/us/articles/6457_Mobile-trends-survey/DI_Build-it-and-they-will-embrace-it.pdf.
[129] Chris Burns. "Android vs iPhone user poll shows two very different groups of people." *SlashGear*, October 25, 2018. https://www.slashgear.com/android-vs-iphone-user-poll-shows-two-very-different-groups-of-people-25551392/.
[130] Ken Yarmosh. "Android vs iOS: Which platform to build for first?" *Savvy*, April 20, 2020. https://savvyapps.com/blog/android-vs-ios-which-platform-to-build-for-first.
[131] Voelcker and Baker (2020) claim that developers typically do not multi-home.
[132] Randy Nelson. "94% of U.S. App Store Revenue Comes From the Top 1% of Monetizing Publishers. Sensor Tower." May 10, 2016. https://sensortower.com/blog/app-store-one-percent.
[133] AppMagic data and Keystone analysis.
[134] Sami Hyrynsalmi, Arho Suominen and Matti Mäntymäki. "The influence of developer multi-homing on competition between software ecosystems." *Journal of Systems and Software*, 111, (January 2016) 119-127. https://www.sciencedirect.com/science/article/pii/S0164121215002010.

The fact that application developers choose to publish applications for both the Apple App Store and Google Play despite the additional development time, complexity, and costs[135] indicates that developers value the captive set of consumers available on both Android and iOS.

[135] Susan Athey. "White Paper – Apple Pay in Australia." 2016.

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by
MARK COOPER, PH.D.*

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I. A Rule of Reason Requires Reasonable Rules

A. New Economic Theory v. Classic Antitrust Abuse

The Consumer Federation of America is procompetitive when it comes to market structure and generally argues for a rule of reason based on fundamentals of economic cost-benefits analysis.[1] However, good consumer economic analysis demands that the rule of reason be based on reasonable rules. The analytic framework must be able to comprehend basic empirical facts in a manner that coherently and realistically integrates economic structure, conduct, and performance. There should be no presumptions in favor of, or against business. The discount rate should reflect the real rate of interest that consumers can earn. The value of a person's time and risk of harm should reflect the economic and intrinsic value of life. The Microsoft case rewards this pragmatic approach to policy analysis handsomely.

At the outset of the trial in *United States v. Microsoft*,[2] few would have predicted the dramatic finding against Microsoft. Many who viewed Microsoft as a dynamic, new economy business had difficulty believing Microsoft had used plain old anti-competitive dirty tricks to achieve its business success and were shocked when the court concluded:

> [O]nly when the separate categories of conduct are viewed, as they should be, as a single, well-coordinated course of action does the full extent of the violence that Microsoft has done to the competitive process reveal itself. In essence, Microsoft mounted a deliberate assault upon entrepreneurial efforts that, left to rise or fall on their own merits, could well have enabled the introduction of competition into the market for Intel-compatible PC operating systems. While the evidence does not prove that they would have

1. In particular, the Consumer Federation of America has applied a similar analysis to a variety of other "network" industries. *See, e.g.*, CONSUMER FEDERATION OF AMERICA AND THE MEDIA ACCESS PROJECT, THE CONSUMER CASE AGAINST MICROSOFT (Oct. 1, 1998) http://www.consumerfed.org/publist.html; CONSUMER FEDERATION OF AMERICA AND CONSUMERS UNION, RESIDENTIAL CONSUMER ECONOMICS OF ELECTRIC UTILITY RESTRUCTURING (July 1998) http://www.consumerfed.org/publist.html; CONSUMER FEDERATION OF AMERICA AND CONSUMERS UNION, ELECTRICITY RESTRUCTURING AND THE PRICE SPIKES OF 1998 (June 21, 1999) http://www.consumerfed.org/publist.html; CONSUMER FEDERATION OF AMERICA, CONSUMER GROUPS UNITE TO OPPOSE THE SBC-AMERITECH MERGER (Jan. 20, 1999) http://www.consumerfed.org/publist.html; CONSUMER FEDERATION OF AMERICA, BREAKING THE RULES: AT&T'S ATTEMPT TO BUY A NATIONAL MONOPOLY IN CABLE TV AND BROADBAND INTERNET SERVICES (Sept. 19, 1999) http://www.consumerfed.org/publist.html.

2. United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999).

> succeeded absent Microsoft's actions, it does reveal that Microsoft placed an oppressive thumb on the scale of competitive fortune, thereby effectively guaranteeing its continued dominance in the relevant market. More broadly, Microsoft's anti-competitive actions trammeled the competitive process through which the computer software industry generally stimulates innovation and conduces to the optimum benefit of consumers.[3]

Contrary to the claims of a recent headline in the *New York Times* Book Review, Microsoft did not lose this case "by defending too much too often."[4] It did not lose because of a remarkably inept defense,[5] or because of allegations that crucial pieces of evidence were rigged,[6] or because of an irrational or biased judge.[7] It lost because its acts were simply indefensible. The intent and effect of its behavior was so blatantly anti-competitive and the economic assumptions necessary to excuse it so narrow and unrealistic, that not even a conservative judge—Ronald Reagan's first judicial appointee[8]—could do anything but find Microsoft guilty by a reasonable interpretation of the antitrust rules (see Exhibit I-1). In fact, numerous conservative antitrust thinkers have recognized that a knee jerk defense of Microsoft is wrong, because it risks destroying all

3. United States v. Microsoft Corp., 87 F. Supp. 2d 30, 44 (D.D.C. 2000) (citations omitted).

4. Adam Liptak, *Microsoft Lost Its Antitrust Case by Defending Too Much Too Often*, NY TIMES ON THE WEB, Feb. 4, 2001, *at* http://www.nytimes.com.

5. *See* Rajiv Chandrasekaran, *U.S., 19 States Discuss Possible Sanctions Plan for Microsoft*, WASH. POST, Feb. 15, 1999, at A1 (using the word "stumbling" to describe the presentation of Microsoft's defense); *see also* James V. Grimaldi, *Some Observers Say Microsoft Has Blown Its Case with Blunders*, SEATTLE TIMES, Feb. 9, 1999, *available at* http://archives.seattletimes.nwsource.com.

6. The most striking example of tainted evidence was the presentation of a videotape which purported to show that the browser could not be removed without impairing the function of the operating system. The witness presenting the video could not account for discontinuities on the tape. JOHN HEILEMANN, PRIDE BEFORE THE FALL 181-86 (2001). Microsoft never did sort out what had occurred, so it is unclear whether this was an honest mistake or deception. Another incident, having to do with a survey that Microsoft had commissioned to support its case, presented the court with a direct effort to mislead. Microsoft appears to have developed a survey of browser users which was purposefully intended to provide an after the fact defense of its behavior. *Microsoft Rigged Survey?*, CNNFN, (Jan. 14, 1999), *at* http://cnnfn.cnn.com/1999/01/14/technology/microsoft/. When one of Microsoft's outside witnesses relied on this data in court, rather than the actual data on which Microsoft's executives relied, the Judge was quite blunt in his rebuke. *See Microsoft*, 84 F. Supp. 2d at 101.

7. Interviews granted during the trial and public statements since have resulted in the appeals court asking parties to comment on the judge's behavior.

8. KEN AULETTA, WORLD WAR 3.0, at 42 (2001).

reasonable rules of a productively competitive marketplace,[9] and warned allowing such behavior will undermine the fundamental competitive dynamic that drives progress in our capitalist economy.[10]

Microsoft attacked the fundamentals of antitrust, hiring the Dean of the Massachusetts Institute of Technology business school and a bevy of consultants[11] to present a theory that asked the court to abandon its traditional view of competition and accept the proposition that markets will inevitably be dominated by very few, very large companies. They claimed that competition does not take place within markets; the struggle is for the entire market. Market domination is benign because firms enjoy the benefits of network effects and virtuous circles of increasing productivity, while the fear of being replaced as the industry leader drives even the dominant firm to innovate and treat consumers just as well as traditional competition for market share in old economy industries.[12] Consequently, Microsoft did not violate the antitrust laws, it was simply the winner-take-all nature of the industry that made it act this way and gave it market dominance. By this definition virtually no act could violate the antitrust laws in this industry.[13]

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9. Robert Bork, *The Most Misunderstood Antitrust Case*, WALL ST. J., May 22, 1998, at A16; Dan Oliver, *Necessary Gateskeeping*, NAT'L REV., May 4, 1998, at 43.

10. Kenneth Starr, Progress and Freedom Foundation and the Brookings Institution, Remarks, *in Microsoft Antitrust Case and Computer Industry Competition*, (C-SPAN television broadcast, Feb. 22, 2001).

11. In the courtroom, Richard Schmalensee analyzed the market structure of the software industry. *See* Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233) (relying on the empirical work of Bernard J. Reddy et al., *Why Does Microsoft Charge So Little for Windows?*, NAT'L ECON. RESEARCH ASSOCS., Oct. 8, 1998. David S. Evans et al., *The Rise and Fall of Leaders in Personal Computer Software*, NAT'L ECON. RESEARCH ASSOCS., Jan. 7, 1999, and Kenneth G. Elzinga & David E. Mills, *PC Software* (Sept. 1998) (all prepared with support from Microsoft)).

12. STAN J. LIEBOWITZ & STEPHEN E. MARGOLIS, WINNERS, LOSERS & MICROSOFT: COMPETITION AND ANTITRUST IN HIGH TECHNOLOGY 154-57 (1999) [hereinafter LIEBOWITZ & MARGOLIS, LOSERS].

13. As Schmalensee wrote in the *American Economic Review*, the month after the trial ended:

> Economists tend to define predatory acts as, roughly, acts that are rational only if they chasten or eliminate competitors. Courts, aware of the cost of discouraging competition, tend to require more, including short-term losses from the acts at issue and plausible expectation of future recoupment of those losses. Clear evidence of intent may help a court decide whether a particular act was predatory. In Schumpeterian industries, however, with "winner take most" markets, neither the basic definition above nor evidence of intent is economically useful.
>
> If there can be only one healthy survivor, the incumbent market leader must exclude its competition or die. Any strategy that does not exclude competition

Evidence at trial revealed that precisely the opposite was true. Because the nature of the industry was not sufficient to entrench its monopoly, Microsoft resorted to repeated, well-documented and protracted campaigns of anti-competitive behaviors to squash its competition. If network externalities would have been sufficient to entrench Microsoft, the immense amount of managerial time and effort and the hundreds of millions, if not billions, of dollars it burned up foreclosing the market to competing products was wasted. It should not have needed to use all these business strategies; it could have relied on just delivering a better product in a networked industry.[14]

The trial also showed that Microsoft's claims to pursuing consumer friendly business tactics that serve the public were contradicted by its actions. If expanding demand for Windows by promoting a complementary product was Microsoft's concern, it did not have to spend hundreds of millions of dollars making sure the dominant browser was Explorer, not Navigator. Since innovation would be the key to any such "system" effects, Microsoft should never have slowed its own products or prevented other products from getting to market, since all innovation stimulates demand for

---

> will not result in survival. There is no useful non-exclusion baseline, which the traditional test for predation requires. Moreover, if near-monopoly is inevitable, welfare is not generally increased by restraining the ferocity of competition for that position, particularly if competition is channeled in directions that benefit consumers, such as innovation or low prices.
>
> As to intent, in a struggle for survival that will have only one winner, any firm must exclude rivals to survive. The intent to exclude is the intent to survive. In a "winner take most" market, evidence that A intends to kill B merely confirms A's desire to survive.

Richard Schmalensee, *Antitrust Issues in Schumpeterian Industries*, 90 AM. ECON. REV. 192, 193-94 (2000).

14. As the *Economist* pointed out, the picture of a new form of beneficial monopoly, relying on network effects to dominate in a positive way, could not hide the reality of plain vanilla monopoly power.

> If network effects did in fact assure monopoly power, the Microsoft monopoly in the operating-systems market would not have been illegal. Under the Sherman Act, monopoly is lawful. It is actions to defend or extend monopoly that break the law. On the view that bad standards are strongly self-reinforcing, no such monopoly-defending action would have been needed. . . .
>
> New paradigm or old, the law has no quarrel with "natural monopolies." It is precisely because network effects were not enough to entrench Microsoft's monopoly—deliberate steps to stifle competition were required too—that the company may face draconian penalties.

Antitrust on Trial, ECONOMIST, Nov. 13, 1999, at 84. A liberal, journalistic version of the same conclusion can be found in Robert Kuttner, *Bill Gates, Robber Baron*, BUS. WK., Jan. 19, 1998, at 20.

Windows. Microsoft should not have cared which brand was used. It should certainly not have spent so much effort on forcing Navigator out of the Mac market.

If bundling were important to expanding demand by creating convenience and lowering costs, Microsoft should not have cared which complements were bundled, since the better they all worked, the greater the demand, but it repeatedly sought to prevent any product, other than its own, from being bundled on new PCs. If improved functionality and ease of use through integration of complement products were critical to stimulating demand, Microsoft should never have threatened to or actually withheld access to interfaces or jolted non-Microsoft products since they needed to function well to expand demand.

If Microsoft were seeking to increase revenues by steering customers through its browser to its portal, it should never have given AOL equal standing with MSN on the boot screen at no charge or allowed OEMs to direct customers to their portals, as long as they used Explorer, not Navigator.

If a pleasing consumer experience is important to expanding demand, Microsoft would have heeded the entreaties of OEMs to simplify and modify boot sequences, when they faced the wrath of dissatisfied consumers, instead of paying them to put up with consumer hassles. It would not have compromised the stability of the operating system with excessive integration.

Microsoft illegally eliminated competition to defend and extend its monopoly and imposed a heavy price on the public. Consequently, application of traditional antitrust rules will achieve exactly the reverse of what Microsoft claimed it would—it will promote innovation by allowing potential competitors, who would otherwise be quickly eliminated by the giant's anti-competitive behaviors, to have a fair chance to enter the market and eventually discipline the price and the quality of Microsoft's products.

B. Outline of the Article

This Article explains why the court had to reject Microsoft's defense by placing the mountain of evidence presented in the trial in a traditional structure-conduct-performance analytic framework.[15] The clear analytic base undermines the claim that the monopoly

15. F.M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 4 (1990); *see also* WILLIAM G. SHEPHERD, THE ECONOMICS OF INDUSTRIAL ORGANIZATION 5 (1985).

persists because of the unique natural tendencies of a new economy software market. It also provides the foundation for an effective remedy to restore competition in the software industry.

Section II presents an overview of the empirical facts within the structure/conduct/performance paradigm. Section III presents a discussion of the anti-competitive business model imposed by Microsoft on the software industry. Section IV presents a discussion of how this business model imposed harm on the public. Section V evaluates the remedy adopted by the court and extracts lessons for future antitrust activity in high technology industries.

II. Market Structure Conditions for Monopoly

A. Workably Competitive Markets: Structure–Conduct–Performance

The structure-conduct-performance (SCP) approach to the analysis of industry structure has been the dominant public policy paradigm in the United States for the better part of this century.[16] In SCP analysis the central concern is with market performance, since that is the outcome that affects consumers most directly. The concept of performance is multifaceted; it includes both efficiency and fairness. The measures of performance to which we traditionally look are pricing and profits, addressing both efficiency and fairness. They are the most direct measure of how society's wealth is being allocated and distributed.[17]

The performance of industries is determined by a number of factors, most directly the conduct of market participants.[18] Do they compete? What legal tactics do they employ? How do they advertise and price their products?

Conduct is primarily a product of other factors. Conduct is affected and circumscribed by market structure. Market structure includes an analysis of the number and size of the firms in the industry, their cost characteristics and barriers to entry, as well as the basic conditions of supply and demand.[19]

The focal point of market structure analysis is to assess the ability of markets to support competition, which "has long been viewed as a force that leads to an ideal solution of the economic performance

16. The Consumer Federation of America has applied a similar analysis to a variety of "network" industries. *See e.g., supra* note 1.

17. SCHERER & ROSS, *supra* note 15, at 4.

18. *Id.*

19. *Id.* at 5.

problem, and monopoly has been condemned."[20] The predominant reason for the preference for competitive markets reflects the economic performance they generate, although there are political reasons to prefer such markets as well.[21] In particular, competition fosters efficient allocation of resources, absence of excess profit, lowest cost production and provides a strong incentive to innovate.[22] Where competition breaks down, firms are said to have market power and the market falls short of these results.[23]

Pure and perfect competition is rare, but the competitive goal is important.[24] Therefore, a great deal of attention has been focused on the relative competitiveness of markets and conditions that make markets more competitive or workably competitive. Summarizing the literature, Scherer and Ross develop the following useful list of these characteristics:

Structural Criteria

The number of traders should be at least as large as scale economies permit.

There should be no artificial inhibitions on mobility and entry.

There should be moderate and price-sensitive quality differentials in products offered.

Conduct Criteria

Some uncertainty should exist in minds of rivals as to whether price initiatives will be followed.

Firms should strive to attain their goals independently, without collusion.

There should be no unfair, exclusionary, predatory, or coercive tactics.

Inefficient suppliers and customers should not be shielded permanently.

Sales promotions should be informative, or at least not misleading.

There should be no persistent, harmful price discrimination.

Performance Criteria

Firms' production and distribution operations should be efficient and not wasteful of resources.

20. *Id.* at 15.
21. *Id.* at 18.
22. *Id.* at 4, 20.
23. *Id.* at 17-18.
24. *Id.* at 16-17.

> Output levels and product quality (that is variety, durability, safety, reliability, and so forth) should be responsive to consumer demands.
>
> Profits should be at levels just sufficient to reward investment, efficiency, and innovation.
>
> Prices should encourage rational choice, guide markets toward equilibrium, and not intensify cyclical instability.
>
> Opportunities for introducing technically superior new products and processes should be exploited.
>
> Promotional expenses should not be excessive.
>
> Success should accrue to sellers who best serve consumer wants.[25]

B. Claims of Unique Competition in New Economy Industries

As noted in the introduction, Microsoft's experts in court argued for a new form of workable competition in the software industry. Schmalensee/NERA present a picture of dynamic competition in the software industry in which

> [c]ompetition in the software industry is based on sequential races for the leadership of categories such as word processing, spreadsheets, personal financial software, games, operating systems, and utilities—not to mention currently unknown categories from which the next generation of "killer applications" will emerge.[26]

Outside of the courtroom, a conservative think tank gave prominence to the arguments in a book entitled, *Winners, Losers and Microsoft* (hereafter referred to as *Losers)*.[27] The authors argue that in the software industry, competition never achieves an equilibrium between companies within a market. Rather competition simply takes place for the entire market. Leaders change when they produce superior products and they capture the entire market.

> Because bigger is better in increasing-returns industries, such industries evolve into monopolies. Monopoly, however, does not lead inevitably to a bad economic outcome for society.... Sometimes an industry develops in such a way that monopoly is not only a likely outcome but also a desirable one. In such industries, what we are likely to witness is not conventional monopoly, but rather serial monopoly. [28]

25. *Id.* at 53-54.
26. Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 17.
27. LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12.
28. *Id.* at 10-11.

. . . .

> Such markets will . . . be "winner-take-all," but only for a while. That is, they will exhibit *serial monopoly*.[29]

Losers purports to show that Microsoft products win in the marketplace because they are higher in quality and that the presence of Microsoft in the marketplace causes prices to decline.

> In the special environment of serial monopoly, monopolistic-looking firms that offer an inferior deal to consumers are readily replaced. In such circumstances, an attempt to exploit a monopoly by restricting output and raising price is suicidal. Further, in the environment of serial monopoly, firms, even monopolistic ones, will end up decreasing their profits if they handicap their products in some way. For example, if they unwisely bundle goods into their product that cost more than they are worth, given the available alternatives, they will lose out. In short, in the environment of serial monopoly (unlike conventional monopoly) the punishment for inferior products, elevated prices or inefficient bundling is obsolescence and replacement.[30]

This view claims that the anti-competitive practices Microsoft used have nothing to do with the monopoly outcome.

> In other software markets, we have consistently found that market share is strongly related to product quality and that market share responds quickly to quality differentials. We would expect a similar relationship in the browser market. . . .
>
> . . . .
>
> Given all this—the quality advantage of Internet Explorer, the enhanced ability of users to switch products, and the ease of providing additional copies of browsers—Internet Explorer's increase in market share can quite easily be explained. One does not need to appeal to other factors such as those the government has focused on in its case against Microsoft (that is, ownership of the operating system or exclusionary contracts) to explain Microsoft's increasing share of the market. [31]

This argument builds on recent new economic theory that challenges the traditional competitive market model. This school of thought, drawing on the works of Schumpeter,[32] argues that "firms need protection from competition before they will bear the risks and costs of invention and innovation, and a monopoly affords an ideal

29. *Id.* at 137.
30. *Id.* at 11.
31. *Id.* at 219-22.
32. *See, e.g.*, JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY (1942).

platform for shooting at the rapidly and jerkily moving targets of new technology."[33]

It argues that basic conditions are so different that the idea of competition among a substantial number of competitors is rendered obsolete. The recent theory holds that in some industries, under some conditions, a dominant firm and a dominant technology can lead to a "virtuous circle" in which positive externalities feed on themselves to propel economic progress.[34] By organizing demand around a standard product, the cost of production falls.

In the computer hardware industry positive feedback loops sustain change and productivity growth that are orders of magnitude larger than typified the industrial age.[35] Advances in computing technology support more advances in computing technology.[36] Standardized and pre-installed bundles of software appear to have allowed the rapidly expanding capabilities of computer hardware to become accessible and useful to consumers with little expertise in computing.[37]

As more and more people use the product, the value to each increases, especially in communications and network industries where people talk to one another. The classic case is the telephone network (or the Internet), where each individual derives greater benefit through the ability to contact numerous other individuals directly.[38] There may be indirect benefits in virtual networks in which two consumers never actually come face-to-face or computer-to-computer. Support services, maintenance and repair, as well as libraries of applications become more readily available. Larger numbers of users seeking specialized applications create a larger

33. SCHERER & ROSS, *supra* note 15, at 31.

34. The arguments have been explicitly applied to the Microsoft case. *See* John E. Lopatka & William Page, *Microsoft, Monopolization, and Network Externalities: Some Uses and Abuses of Economic Theory in Antitrust Decisionmaking*, 40 ANTITRUST BULL. 265 (1995).

35. Brian R. Gaines, *The Learning Curve Underlying Convergence*, 1998 TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE 30-31.

36. Brian Arthur, *Positive Feedbacks in the Economy*, SCI. AM., Feb. 1990, at 95-96.

37. Michael Katz & Carl Shapiro, *Antitrust and Software Markets*, *in* COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST AND THE DIGITAL MARKETPLACE (Jeffrey A. Eisenbach & Thomas M. Lenard eds., 1999) [hereinafter Katz & Shapiro, *Antitrust and Software*].

38. Jeffrey Church & Neil Gandal, *Complementary Network Externalities and Technological Adoption*, 11 INT'L J. INDUS. ORG. 239, 241 (1993).

library of applications that become available to other users,[39] and secondary markets may be created.

By increasing the number of units sold, the cost per unit falls dramatically.[40] On the supply side, certain industries, like computing and networking industries, tend to have high fixed and front end costs. Cost savings apply not only to initial production costs, but also to service and maintenance costs.[41] As the installed base of hardware and software deployed grows, learning and training in the dominant technology is more valuable since it can be applied to more users and uses.[42] Firms seek to capture these positive externalities and accomplish technological "lock-in."[43] After capturing the first generation of customers and building a customer and programming base tied to dominant software, it becomes difficult, if not impossible, for later technologies to overcome this advantage. Customers hesitate to abandon their investments in the dominant technology and customer acquisition costs rise for latecomers.

III. Economic Theory v. Business Reality

A. Market Structure

(1) Market Dominance

Painting a picture of empirical reality to support the theory proved a difficult proposition for Microsoft's expert witness. Citing work commissioned by Microsoft at National Economic Research Associates (NERA), Schmalensee argued that Microsoft's current market dominance was not a source of market power because entry into the software industry is easy.[44] He tried to demonstrate this by presenting a historical analysis of software category leaders and cataloguing the availability of alternatives. When Windows 95 replaced Windows 3.0, Schmalensee/NERA claimed, there was a change in leadership, even though Microsoft develops, markets, and controls both products.

39. *Id.*; *see also* Chou Chien-fu & Oz Shy, *Network Effects Without Network Externalities*, 8 INT'L J. INDUS. ORG. 259, 260 (1990).

40. Arthur, *supra* note 36, at 92-93.

41. Melissa A. Schilling, *Technological Lockout: An Integrative Model of the Economic and Strategic Factors Driving Technology Success and Failure*, 23 ACAD. MGMT. REV. 267, 270 (1998).

42. *Id.*

43. HAL VARIAN & KARL SHAPIRO, INFORMATION RULES (1999).

44. Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 18-20.

The objective was to give the impression that leadership is always changing hands in the software industry and that Microsoft is just one of the companies that could be replaced at any moment. Thus, Schmalensee/NERA attempted to show that fourteen different products dominate the five major software categories and no product dominates for long. According to this view, every category but one has at least three leaders. Most periods of leadership are short, less than a decade.

There is simply no justification to consider a change in the model of a product a change in market leadership or domination. When markets are viewed through the lens of the firm the picture is quite different (see Exhibit III-1). There are eight firms that have held a leadership position in one or more categories. There is only one firm that totally dominates the landscape.

Microsoft has dominated the operating system category for sixteen years and still does. No other firm has come close to replicating either Microsoft's market share or its period of dominance. Five generations of Intel-based PCs have seen no change in the dominant firm.

Microsoft is the only firm to achieve a market share exceeding 90%, first in the operating system and then in the office suite. It is the only firm to achieve the generally accepted monopoly level of 65-70% in more than one software market.

Microsoft is the only firm to dominate more than one category on the list. It dominates four of the five simultaneously and has never relinquished domination once it conquers a market.

Microsoft is the only firm on the list that purchased, rather than created, the basic programs in virtually every category it dominated.

In the one area where Microsoft has not achieved dominance, personal finance programs, it attempted to buy the industry leader but was rebuffed by the Department of Justice. The reason it has failed to dominate this area is also revealing. Schmalensee recognized that personal finance software is not as heavily subject to network externalities.[45] Microsoft is less able to leverage its market power over the operating system to conquer this market, perhaps that is why it failed.

When Schmalensee analyzed the installed base of users, he gave a similarly distorted view.[46] He simply left out Microsoft's base. He identified approximately twenty-three million non-Microsoft users,

45. *Id.* at 39.
46. *Id.* at 50-55.

split roughly equally between Mac and others.[47] The suggestion is that the non-Microsoft market is large enough to provide a base for competition. This approach is misleading, since the Microsoft installed base is at least twelve times as large as the combined competition, and could be as much as twenty times as large depending on what one assumes about the life-span of computers (see Exhibit III-2). It is approximately twenty-five times as large as the next largest competitor. It is over thirty times as large as the next largest PC-based competitor. Given the huge advantage in economies of scale attendant on such a base, it is extremely difficult for entrants to build a business on the basis of the non-Microsoft installed base.[48] A realistic analysis of industry leadership contradicts the Microsoft view. There is no "serial" in Microsoft's monopoly.

(2) Barriers to Entry

As unconvincing as the market structure analysis was, the second prong of the Microsoft argument was even weaker. Microsoft's defenders claimed that its dominant market position and extremely high market share do not constitute a basis for the exercise of market power because entry and exit in the software industry are extremely easy. Switching costs, compatibility problems and network effects are not substantial entry barriers.[49]

Microsoft executives knew full well that each of the problems that Schmalensee/NERA dismissed is actually a *"huge"* barrier. Through their words and deeds Microsoft's senior executives demonstrated that they believed the opposite of what the experts said and acted in exactly the opposite manner in the market. Microsoft's witnesses asked the court to disregard their words and deeds and believe that Microsoft executives did not understand their own market.

In a December 1997 memorandum, the Senior VP responsible for pricing to Microsoft's most important customers—computer manufacturers (original equipment manufacturers or OEMs)—

47. *Id.* at 54.

48. The discussion of the number of available programs is similarly distorted. Schmalensee/NERA identify thousands of programs available for competing operating systems. Mac is identified with about 12,000 programs in 1998. *See* Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 54. Windows had twice as many programs available five years ago. *See* Declaration of David Sibley at 14, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233) (citing a figure of 25,000 for 1993).

49. Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 55-63.

concluded that Microsoft's high prices were protected by a variety of barriers to entry.[50] Although computer manufacturers had an incentive to compete in operating systems because of Microsoft's high prices, they faced problems of consumer switching costs.[51] Software vendors were stymied by compatibility problems.[52] Even Intel could not compete in operating systems,[53] since Microsoft could respond to such a threat by using its deep pockets to buy a chip manufacturer and bolt its operating system onto the CPU, leveraging control of compatibility to defend and extend its monopoly.[54] So much for the

50. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233); *see also* Mary Jo Foley, *Who is Microsoft's Secret Power Broker?*, ZDNET, Feb. 1, 1998 (describing Joachim Kempin by saying "he has the final sign-off on all Microsoft licensing contracts with all hardware makers ... and he is the Microsoft official around whom swirls most of the current Microsoft vs. DOJ fireworks").

51. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

> Our high price could get a single OEM or a coalition to fund a competing effort. While this possibility exists I consider it doubtful even if they could get a product out that they can market it successfully, leapfrog us and would not deviate them from their own standard. Could they convince customers to change their computing platform is the real question. The existing investments in training, infrastructure and applications in windows computing are huge and will create a lot of inertia.

Id.

52. *Id.*

> SUN and its coalition with Java. For the next 2-3 years the barriers are huge... In addition there is the compatibility barrier... [Netscape] may come from the browser side, but I consider them too weak to succeed alone—so they are only dangerous if they team up with SUN. Again compatibility and yet another platform are the biggest inhibitors.

Id.

53. *Id.*

> This could be an INTEL led and funded coalition—say with Compaq and Netscape. I am convinced they have been thinking about this for some time. They could buy SUN SOFT or start a skunk work project on their own. If they decide to sell the Operating System for $1 and the CPU for $200 they will get the OEMs on their side. The customer inertia argument remains and that will prevent them to build momentum easily.

Id.

54. *Id.*

> Our reaction could be to buy National semiconductor or AMD or both and own the CPU and the SW business—while both stocks are taking a dive. We would sell SW at $100 and CPU at cost +1. How sure are we of our partnership and how fast could we react if needed? We could bring compatibility to another platform better than anybody else and we would have the money to fund the fabrication capacity.

Id.

claim that a brilliant computer science major in his garage can displace Microsoft;[55] not even the combination of Intel, Compaq, Sun and Netscape can overcome these barriers to entry.[56]

B. Corporate Conduct

(1) The War Against the Browser

Microsoft's defense of its conduct relies on a claim that it just competes very hard in every product market it enters.[57] Its experts place a great deal of emphasis on product quality. Microsoft's domination of product lines is attributed to the fact that, while it starts behind in most products, it develops equal quality and then wins the market.[58] The whole market tips to Microsoft, once their product is superior.[59] In particular, *Losers* claims that by 1996 Internet Explorer had pulled equal with Netscape Navigator.[60]

As with the evidence on market structure, the direct evidence on conduct refutes the claims of Microsoft experts with great specificity. Contradicting the theory, this was the very moment at which Microsoft executives were redoubling their efforts to use their "other factor" leverage to drive Netscape from the market.[61] Competing on quality was not at all what Microsoft had in mind. Foreclosing the market was. Microsoft went to great lengths to bring that result about.

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55. Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 47.

56. In this regard, the fact that Microsoft has successfully prevented Intel from developing its NSP software as disclosed in the trial is a very important element of the overall case. Intel could not, over Microsoft's objection, even bring a new piece of software to market in a field that Microsoft did not dominate. The chances it could bring a competing system to market are even smaller. *See Microsoft*, 84 F. Supp. 2d at 94-103.

57. Report of Direct Testimony of Richard Schmalensee, *supra* note 11, at 127.

58. *Id.*

59. See LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, at 165-73.

60. *Id.* at 217-23.

61. *See Microsoft*, 84 F. Supp. 2d at 51 (quoting messages from James Allchin to Paul Maritz).

> I don't understand how IE [Internet Explorer] is going to win. The current path is simply to copy everything that Netscape does packaging and product wise.... We are not leveraging Windows from a marketing perspective and we are trying to copy Netscape and make IE into a platform. We do not use our strength—which is that we have an installed base of Windows and we have a strong OEM shipment channel for Windows. I am convinced we have to use Windows—this is the one thing they don't have... We have to be competitive with features, but we need something more—Windows integration.

Id.

The evidence at trial focuses on Microsoft's battle to prevent Netscape/Java from becoming a threat to the Microsoft monopoly through insertion into the middle of the market,[62] although the evidence indicates that the abusive business model affected many markets over the course of at least a decade.[63] The CEO of the company made it clear that the browser was a competitive threat to Microsoft's dominant position.

> A new competitor "born" on the Internet is Netscape. Their browser is dominant, with 70% usage share, allowing them to determine which network extensions will catch on. They are pursuing a multi-platform strategy, where they move the key API into the client to commoditize the underlying operating system.[64]

As Microsoft saw it, Netscape/JAVA could weaken its hold on the market because they were able to insert themselves between the Windows operating system and the applications that ran on top of it. They are "middleware." They offer independent software vendors (ISVs) the possibility of writing applications that can work with many operating systems. They do this by making available to programmers the applications programming interfaces (APIs). When APIs are exposed, programmers can "call" them to develop new applications.

Because they hope to be compatible with numerous operating systems and hope to support many applications, these "middleware" programs make consumers indifferent to which operating system is used. This threatens to weaken Microsoft's hold on the market. In its terms, it "commoditizes" its core product. If a competitor can create a stock of compatible applications, he can advertise that the new operating system can run all the existing programs, undermining the economic leverage of Windows. If the installed base of platforms and browsers are out there, the Windows operating system could be bypassed. By capturing the browser market, Microsoft precluded that possibility. The campaign against Netscape simultaneously extended the monopoly into the browser market and defended the monopoly in the operating system market by preserving the barrier to entry.

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62. *See id.* at 28-29.

63. *See generally* JENNIFER EDSTROM & MARLIN ELLER, BARBARIANS LED BY BILL GATES (1998); WENDY GOLDMAN ROHM, THE MICROSOFT FILE (1998); RANDALL E. STROSS, THE MICROSOFT WAY (1997); JOHN WALLACE & JIM ERICKSON, HARD DRIVE (1992).

64. Government Exhibit #20: Memorandum from Bill Gates, The Internet Tidal Wave, dated May 26, 1995, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233) [hereinafter *Internet Tidal Wave*].

Microsoft's first response to the growth of the Internet and the development of the browser as a threat to its operating monopoly appears to have been to attempt to divide the market or gain a mutual non-aggression agreement.[65] That is, it sought to convince a competitor to go in one direction, while it went in another. There are at least four examples in the evidence in which Microsoft sought to divide the market. Microsoft attacked Intel's contemplation of developing software applications, denying consumers functionalities for years.[66] Apple software efforts were also the object of Microsoft efforts to divide markets.[67] IBM was a particular target for Microsoft efforts to seal off its market.[68]

If the market division proposal was turned down, Microsoft threatened to go into the competitors' line of business more vigorously. While the attack on Netscape was the central focus of the case, other instances also involved major players in the industry.[69] Using the operating system as the core of its market power,[70] Microsoft erects barriers to entry. It freezes out competitors with incompatibilities,[71] builds in features to impede or disable competing programs,[72] withdraws support for competitor programs,[73] and locks customers in with constant imitation of competing products[74] or promises to imitate them.[75] These practices make it difficult for competitors to design products that operate well as the operating

65. *Microsoft*, 84 F. Supp. 2d at 30-31.

66. *Id.* at 34.

67. *Id.* at 36.

68. *Id.* at 28-43.

69. *Id.* at 34-44.

70. EDSTROM & ELLER, *supra* note 63, at 207.

71. *The World According to Microsoft*, PC WK. ONLINE, June 8, 1998.

72. The practices span at least three generations of operating systems. It began with the "scare message" in Windows 3.1 to makes DR-DOS users "feel uncomfortable and when he has bugs, suspect the problem is DR-DOS and then go out and buy MS-DOS or decide not to take the risk for the other machines he has to buy for his office." ROHM, *supra* note 63, at 89. Windows 95 and Windows 98 have apparently disabled competitors' programs rather than warn about possible incompatibilities. *See* James Gleick, *Making Microsoft Safe for Capitalism*, 1996 ANTITRUST L. & ECON. REV. 71, 81; *Windows 98 Disables Microsoft Competitors' Software*, CNET, July 4, 1998l.

73. ROHM, *supra* note 63, at 69, 70; *Mine All Mine*, TIME, June 5, 1995.

74. *See* Willow A. Sheremata, *Barriers to Innovation: A Monopoly, Network Externalities, and the Speed of Innovation*, 42 ANTITRUST BULL. 937, 941, 964, 967 (1997) [hereinafter Sheremata, *Barriers to Innovation*].

75. The preannouncement issue received considerable attention during the first federal action against Microsoft. ELLER & EDSTROM, *supra* note 63, at 42-43; WALLACE & ERICKSON, *supra* note 63, at 240-48.

system is manipulated and changed.[76] There also have been charges of back room campaigns of intimidation,[77] abrogation of contracts,[78] patent infringement,[79] and predatory pricing, in which the profits from the monopoly over the operating system are used to drive competitors out of other software lines.[80]

As was its practice, when Microsoft's overture to divide the market with Netscape was rebuffed, it set out to market a browser of its own using its well-tested strategy of tying applications to its operating system product.[81] There is no evidence that Microsoft's Internet browser was superior in any way to its competitors. The preservation of its operating system monopoly was the driving force in Microsoft's entry into the browser market. This is the core of the case against Microsoft.[82] Being an innovative leader was not how this battle was to be won,[83] leverage and tying were the key,[84] including

76. EDSTROM & ELLER, *supra* note 63, at 117. ROHM, *supra* note 63, at 187 recounts the complaints about the desktop applications. Gleick, *supra* note 72, at 87 notes a similar phenomenon with respect to the Internet.

77. ROHM, *supra* note 63, at 148, 237, 270.

78. The line between imitation and abrogation of contracts or patent infringement has never been very clear in Microsoft's business model and has resulted in repeated disputes including court cases involving Stac Electronics, ROHM, *supra* note 63, at 147-151, as well as settlements of similar claims including CPM, see JOHN WALLACE, OVERDRIVE 41 (1997) and ROHM, *supra* note 63, at 41, and others such as pen-based systems, see ROHM, *supra* note 63, at 93-101, and hardware, see WALLACE & ERICKSON, *supra* note 63, at 390.

79. *See* ROHM, *supra* note 63, at 93-101, 147-51; Alan Akin, *Microsoft and 3D Graphics: A Case Study in Suppressing Innovation and Competition*, July 16, 1997 (posted on Boycott Microsoft *available at* http://www.vcnet.com/bms/features/); Microsoft's strategy, also known as "embrace and extend," is not new. Gates first mentioned it publicly in *Mine All Mine*, TIME, June 5, 1998.

80. WALLACE, *supra* note 78, at 162-65.

81. United States v. Microsoft Corp., 84 F. Supp. 2d 9, 43 (D.D.C. 1999).

82. United States v. Microsoft Corp., 87 F. Supp. 2d 30, 52-57 (D.D.C. 2000).

> Microsoft paid vast sums of money, and renounced many millions more in lost revenue every year, in order to induce firms to take actions that would help enhance Internet Explorer's share of browser usage at Navigator's expense. . . . In fact, Microsoft has expended wealth and foresworn opportunities to realize more in a manner and to an extent that can only represent a rational investment if its purpose was to perpetuate the applications barrier to entry. Because Microsoft's business practices "would not be considered profit maximizing except for the expectation that . . . the entry of potential rivals" into the market for Intel-compatible PC operating systems will be "blocked or delayed," Microsoft's campaign must be termed predatory.

Id.

83. *Id.* at 160.

> First we need to offer a decent client (O'Hare) that exploits Windows 95 shortcuts. However, that alone won't get people to switch away from Netscape. We need to figure how to integrate Blackbird, and help browsing into our Internet client. . . . We need to move all of our Internet value added from the

efforts to undermine the quality of the competing product.[85] Integration was a business strategy[86] to foreclose a competitor, including a delay in the release of Windows 98 until Internet Explorer 4.0 was ready to be included with that product, even though it hurt Microsoft's most important customers, the OEMs.[87]

The trial fully documented a campaign to cut off a potential competitor's air supply by making it difficult to sell, find, or use his products, by shutting down distribution channels, denying advertising and promotion channels, undermining its functionality, denying it resources and causing it to expend resources. Microsoft carried out its war against this and other middleware threats by attempting to ensure that no PC industry participants would in any way support or assist Netscape/JAVA.[88]

At the heart of Microsoft's anti-competitive practices are four categories of abuses. First, Microsoft took steps to prevent

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Plus pack into Windows 95 itself as soon as we possibly can with a major goal to get OEMs shipping our browser preinstalled.

Id.

84. *Id.*

If you agree that Windows is a huge asset, then it follows quickly that we are not investing sufficiently in finding ways to tie IE and Windows together... most importantly it must be killer on OEM shipments so that Netscape never gets a chance on these systems.

Id. at 166.

85. *Id.*

Microsoft's executives believed that the incentives that its contractual restrictions placed on OEMs would not be sufficient in themselves to reverse the direction of Navigator's usage share. Microsoft set out to bind Internet Explorer more tightly to Windows 95 as a technical matter. The intent was to make it more difficult for anyone, including systems administrators and users, to remove Internet Explorer from Windows 95 and to simultaneously complicate the experience of using Navigator with Windows 95. As Brad Chase, Vice President for developers and windows marketing, wrote to his superiors near the end of 1995, "We will bind the shell to the Internet Explorer, so that running any other browser is a jolting experience."

Id. at 160.

86. *Id.* at 167.

87. *Id.*

Maritz recognized that the delay would disappoint OEMs. First, while OEMs were eager to sell new hardware technologies to Windows users, they could not do this until Microsoft released Windows 98, which included software support for the new technologies. Second, OEMs wanted Windows 98 to be released in time to drive sales of PC systems during the back-to-school and holiday selling seasons. Nevertheless, Maritz agreed with Allchin's point that synchronizing the release of Windows 98 with Internet Explorer was "the only thing that makes sense even if OEMs suffer."

Id.

88. *Id.* at 58-85.

competitors from getting the same access to users of computers or services who had entered into an agreement with Microsoft. If OEMs, ISPs, or ICPs were inclined to install other browsers, Microsoft sought to ensure that no browser would have equal placement.[89] Second, it sought to foreclose distribution channels to other browsers altogether. Contracting parties were required to ship IE, and dissuaded from shipping competing browsers.[90] Third, it took actions which were intended to ensure IE's quality was superior to browsers operating on Windows machines. Contracts required use of software that gave Microsoft a superior presentation, while the underlying software also disabled competitors.[91] Finally, there were conditions to prevent competitors from garnering resources.[92]

The quality analysis presented by Microsoft defenders is undercut by the trial evidence. It shows that Microsoft may have "won" the trade press reviews not so much because it built a better mouse trap but because it impaired the ability of its competitors to build one.[93] At exactly the time that the trade press reviews of Microsoft's browser were catching the reviews of Netscape's browser, Microsoft had launched a campaign to undermine the quality of its competition. Not only did Microsoft manipulate the operating system to give its product an advantage, it denied or slowed access to its operating system to prevent Netscape from improving and delivering its product.[94]

89. *Id.* at 59-67.
90. *Id.* at 67-69.
91. *Id.* at 49-53.
92. *Id.* at 51.
93. *Id.* at 111-12.
94. *Id.*

Although Netscape declined the special relationship with Microsoft, its executives continued over the weeks following the June 21 meeting to plead for the RNA API. Despite Netscape's persistence, Microsoft did not release the API to Netscape until late October, *i.e.*, as Allard had warned, more than three months later. The delay in turn forced Netscape to postpone the release of its Windows 95 browser until substantially after the release of Windows 95 (and Internet Explorer) in August 1995. As a result, Netscape was excluded from most of the holiday selling season.

Microsoft similarly withheld a scripting tool that Netscape needed to make its browser compatible with certain dial-up ISPs. Microsoft had licensed the tool freely to ISPs that wanted it, and in fact had cooperated with Netscape in drafting a license agreement that, by mid-July 1996, needed only to be signed by an authorized Microsoft executive to go into effect. There the process halted, however. In mid-August, a Microsoft representative informed Netscape that senior executives at Microsoft had decided to link the grant of the license to the resolution of all open issues between the companies. Netscape never received a

In addition, the court makes the point that under the weight of the anti-competitive onslaught, Microsoft's competitors were forced to give up. Squeezed out of the market and drained of resources, they could no longer afford to devote resources to the product.

> Not only did Microsoft prevent Navigator from undermining the applications barrier to entry, it inflicted considerable harm on Netscape's business in the process. By ensuring that the firms comprising the channels that lead most efficiently to browser usage distributed and promoted Internet Explorer to the virtual exclusion of Navigator, Microsoft relegated Netscape to more costly and less effective methods of distributing and promoting its browsing software. After Microsoft started licensing Internet Explorer at no charge, not only to OEMs and consumers, but also to IAPs, ISVs, ICPs, and even Apple, Netscape was forced to follow suit. Despite the fact that it did not charge for Internet Explorer, Microsoft could still defray the massive costs it was undertaking to maximize usage share with the vast profits earned licensing Windows. Because Netscape did not have that luxury, it could ill afford the dramatic drop in revenues from Navigator, much less to pay for the inefficient modes of distribution to which Microsoft had consigned it. The financial constraints also deterred Netscape from undertaking technical innovations that it might otherwise have implemented in Navigator. Microsoft was not altogether surprised, then, when it learned in November 1998 that Netscape had surrendered itself to acquisition by another company.[95]

It is impossible to argue that quality won the day in the browser market. There is no way to know what would have happened in a marketplace where fair competition was taking place, although Microsoft's executives clearly believed that if they did not leverage their market power in the operating system, they would lose the browser war.[96]

(2) SmartSuite

Antitrust courts can look at past patterns of behavior, both in reaching conclusions about current conduct and in crafting remedies.[97] Another product that makes a significant appearance in the court case (and *Losers*) is IBM's SmartSuite. The court concludes

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license to the scripting tool, and as a result, was unable to do business with certain ISPs for a time.

Id. at 33-34.

95. *Id.* at 103-04.

96. *See id.* at 51.

97. *Id.* at 34.

that Microsoft leveraged its control over the operating system to attack this product. Over this period, IBM's ability and intention to preinstall an office suite brought retaliation from Microsoft and reduced its shipment of computers substantially.[98]

> The IBM PC Company had begun negotiations with Microsoft for a Windows 95 license in late March 1995. For the first two months, the negotiations had progressed smoothly and at an expected pace. After IBM announced its intention to acquire Lotus, though, the Microsoft negotiators began canceling meetings with their IBM counterparts, failing to return telephone calls, and delaying the return of marked-up license drafts that they received from IBM. Then, on July 20, 1995, just three days after IBM announced its intention to pre-install SmartSuite on its PCs, a Microsoft executive informed his counterpart at the IBM PC Company that Microsoft was terminating further negotiations with IBM for a license to Windows 95. Microsoft also refused to release to the PC Company the Windows 95 "golden master" code. The PC Company needed the code for its product planning and development, and IBM executives knew that Microsoft had released it to IBM's OEM competitors on July 17. Microsoft's purported reason for halting the negotiations was that it wanted first to resolve an ongoing audit of IBM's past royalty payments to Microsoft for several different operating systems.[99]

Thus, as in the case of the browser, Microsoft centered its attention on denying a competing product the easiest means of distribution—preinstallation. Microsoft sought to prevent IBM from preinstalling its office suite on its computers. Interestingly, this battle to convince IBM not to preinstall its office suite was essentially an attempt to divide the market, to have IBM focus on being a hardware company and stay out of the software business. The instruments that Microsoft used to undermine IBM's preinstallation of a competing product are familiar—delay and desupport by leveraging the operating system.

This is not the only reason that Microsoft's Office came to dominate this market, but it was a landmark on Microsoft's abusive timeline. This was a crucial moment to prevent a competitor from

98. Gleick, *supra* note 72, at 88.

> In 1991, Mike Maples, a senior Microsoft executive, described the company's goals in the aggressive style that its top executives use to favor: If someone thinks we're not after Lotus and after WordPerfect and after Borland, they're confused.... My job is to get a fair share of the software applications market, and to me that's 100 percent.

Id.

99. United States v. Microsoft Corp., 84 F. Supp. 2d 9, 40 (D.D.C. 1999).

gaining an installed base according to the data in *Losers*.[100] Microsoft's advantage came from leveraging the operating system and impairing the ability of the most important competitor to ship its product. Microsoft executives certainly thought that the leverage was helping. When a senior Microsoft executive argued for leveraging the operating system more to win the browser wars, he pointed to the Office market as an example of how leverage works.

> Let's [suppose] IE is as good as Navigator/Communicator. Who wins? The one with 80% market share. Maybe being free helps us, but once people are used to a product it is hard to change them. Consider Office. We are more expensive today and we're still winning. My conclusion is that we must leverage Windows more. Treating IE as just an add-on to Windows which is cross-platform [means] losing our biggest advantage—Windows market share. We should dedicate a cross group team to come up with ways to leverage Windows technically more .... We should think about an integrated solution—that is our strength.[101]

(3) The Operating System: DR-DOS and NewWave

In presenting Microsoft's history of leadership, its defenders try to invoke its track record of innovation in its defense, yet that history can be used to prove exactly the opposite. In fact, if we go back to the late 1980s and early 1990s, we find that the "other factors" were at least as prominent as they were in the Browser case.[102] The claim that Microsoft gained its advantage by being a leader on the quality side is contradicted by its vigorous pursuit of imitation combined with anti-competitive practices.[103]

The elimination of the last significant competing operating system from the Intel-based PC market is central to understanding how leverage was used at this crucial time in the software market. The victory over DR-DOS did not rest on a quality advantage.[104]

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100. LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, at 146-47.

101. *Microsoft*, 84 F. Supp. 2d at 51.

102. *See* LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, at 150-157.

103. EDSTROM & ELLER, *supra* note 63, at 207; Gleick, *supra* note 72, at 82; David B. Yoffie, *CHESS and Competing in the Age of Digital Convergence*, *in* COMPETING IN THE AGE OF DIGITAL CONVERGENCE 27 (Harvard Business School ed., 1997).

104. Sheremata, *Barriers to Innovation*, *supra* note 74, at 942.

> At the time DR-DOS 5.0 received much critical acclaim as the superior product. However 1 month after DRI introduced DR-DOS 5.0, Microsoft preannounced a similar set of features for MS-DOS. Although Microsoft did not ship these features until over 1 year later, by 1993 market share for DR-DOS had fallen to 3%. MS-DOS share rose to 79%.

Rather, Microsoft imposed contract conditions on suppliers that foreclosed and deterred competition. The early use of contracts to secure the operating system monopoly against its rival, DR-DOS, is central to Microsoft's dominance in the 1990s.

> By 1991 account managers would read the terms of the licensing policy in their OEM manuals in brief form. The new licensing terms had started in the Far East, when low-cost clone vendors were happy to increase their slim profit margins by using a cheaper but better version of DOS—from DRI. Microsoft had implemented what eventually became known as "per processor" licenses, which effectively locked computer makers into contracts that required them to pay for the Microsoft operating system on every computer.[105]

Moreover, at the same time Microsoft was leveraging DR-DOS out of the market, it was leveraging competing desktop applications out of the market.[106] As with the browser, these earlier cases of leveraging involved more than just shutting down distribution channels. The full range of technical and economic weapons were

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> However, MS-DOS technology was based on CP/M which was an earlier version of DR-DOS. This lends credence to reports that DR-DOS was the product with superior quality. Apparently, Microsoft successfully applied its monopoly power to forestall competitive innovation.

Id.

105. ROHM, *supra* note 63, at 41.

106. *Id.* at 71, 77, 78.

> Gates, Lieven, Huels, and Reichel now discussed, among other things, an agreement "to get DRI/Novell out of Vobis," a strategic partnership between the two companies, and a commitment that Vobis would agree to sell "no Novell NetWare Lite" but instead would contract for 25,000 copies of Windows for Workgroups—a new product for Microsoft in the market for computer networks in which it had no presence....
>
> Among the e-mail messages not produced to the feds from the computers of Microsoft Germany was one that Bernard Vergnes sent to a number of other Microsoft executives on September 7, 1992. Along with documenting the Vobis deal, it showed Microsoft's intent to use its DOS contracts to leverage computer makers into buying Microsoft applications software in place of that from Lotus and others....
>
> In April 1991, Ballmer and Lieven had met in Nice. Ballmer had discussed other "inducements," as Lieven would testify, involving bundling Microsoft applications software with an operating system deal. A Microsoft Word/Excel combination was suggested as part of the DOS/Windows deal....
>
> After noting the success of Gates' meeting with Lieven, and the strong market presence of Vobis—number one in market share, over IBM—the memo said: Lieven... is willing to no longer offer DRI-DOS or Network Lied [*sic*]... As you know, Lotus and Borland have been aggressively approaching our OEMs, and Vobis is no exception.

Id.

used to drive competing software from the market and to undermine its attractiveness to consumers. Microsoft leveraged the operating system by creating incompatibilities.

> OLE, per se, wouldn't make its debut in Windows until 1992. It was heavily criticized for making the overall Windows system fat and bloated. OLE consumed memory, process cycles, and not surprisingly, was difficult for developers to support. Applications compatibility introduced a whole other set of constraints on applications developers. But that was exactly what it was designed to do. As Eller argued, OLE was *supposed* to be fat and bloated. Integration was all about making monolithic applications slowly trade components among each other.
>
> OLE was designed to protect developers of big applications who were afraid of being scooped by slick applets, little applications being crafted by much smaller development companies.
>
> Microsoft didn't want a lot of other companies writing code that could compete. It wanted to keep barriers to entry very high. The idea, in fact, was to keep raising the bar, putting in more layers of software and APIs, which developers would then have to support. Microsoft wanted to make it so gnarly that anybody who couldn't devote a team of one hundred programmers to every Windows application would be out of the game.[107]

From the outset, the process of building incompatibilities was driven by preservation of the monopoly on the operating system. In the early 1990s, Microsoft was already attacking "middleware" to ensure its dominance in the applications market.

> Established partly to promote code and resource sharing between Microsoft's Word and Excel Application groups, Whitten's team was also a reaction to a new software product from Hewlett Packard called NewWave.
>
> NewWave ran on top of Windows 2.03 and was part of HP's glowing vision of how the office of the future would work: orchestrated information sharing among different applications.
>
> If HP were successful, it could end up owning the application programming interfaces, or APIs, dictating how applications would run on a PC. If HP succeeded, instead of writing to Microsoft's Windows APIs, developers might write to HP's. This was an immediate threat.
>
> Nathan Myhrvold wrote of Microsoft's need to control API's in order to maintain its stranglehold on the operating systems business:

107. EDSTROM & ELLER, *supra* note 63, at 117.

> The relationship of an application to the system API is similar to the relationship that the roots of a tree have with the ground—it is very complicated and makes it difficult for third parties to clone. This helps prevent competitors from dislodging a successful operating system. Evolution and innovation provide another barrier as well as upgrade revenue. The system must evolve its APIs and implementation over time in order to remain successful. This gives ISVs more features to exploit, makes it more difficult to clone, and it gives users a reason to pay for an upgrade.
>
> The applications architecture group sprang forth immediately, and from it sprang object linking and embedding (OLE).[108]

Cross subsidies from operating system profits undermined the financial resources of competitors.

> WordPerfect's profits were further eroded in the early 1990s by the software price wars, which were part of Microsoft's strategy to keep prices low in order to establish market share. Microsoft could afford the razor thin margins that resulted because it had a steady revenue stream from DOS and Windows. Other companies, like Borland and WordPerfect, did not. . . .
>
> "Gates wanted this business so badly that he was willing to give it [Microsoft Office] away for a while," said Kahn. "Because of his position in operating systems, he had no problems doing that because Microsoft was making so much money. Bill was buying market share and kicking everybody else from the market." [109]

Since Microsoft always used these anti-competitive "other factors" while it improved its product, it is simply impossible to conclude, as Schmalensee and *Losers* do, that quality won out.

IV. Market Performance: Consumer Harm

There are two readily identifiable areas of consumer harm in the court's findings—qualitative harm to consumers and monetary harm.[110] The court focused on issues of quality and innovation, although it did note pricing abuse.[111] A precise quantitative estimate of monetary harm was not a focal point in the courtroom because there could be no monetary penalty in this case. Identifying the pricing practices that indicated abuse, and the various anti-competitive uses to which the ill-gotten gains have been put, was

108. *Id.* at 113-14.
109. WALLACE, *supra* note 78, at 162-65.
110. United States v. Microsoft Corp., 84 F. Supp. 2d 30, 110-12 (D.D.C. 2000).
111. *Id.* at 57-66.

sufficient. Microsoft and its defenders have attempted to misrepresent this as a failure to show consumer harm.[112]

This chapter focuses on the issue of direct monetary harm and the exercise of monopoly power over price. It then briefly reviews the qualitative and indirect forms of harm imposed on the public by Microsoft's abuse of market power.

A. Microsoft's Pricing Strategy

One of the most critical areas of conduct and performance analysis is pricing practices. The court was closely cognizant of Microsoft's internal pricing analysis as an indicator of monopoly pricing, concluding that

> Microsoft's actual pricing behavior is consistent with the proposition that the firm enjoys monopoly power in the market for Intel-compatible PC operating systems. The company's decision not to consider the prices of other vendors' Intel-compatible PC operating systems when setting the price of Windows 98, for example, is probative of monopoly power. One would expect a firm in a competitive market to pay much closer attention to the prices charged by other firms in the market. . . .
>
> [I]t is indicative of monopoly power that Microsoft felt that it had substantial discretion in setting the price of its Windows 98 upgrade product (the operating system product it sells to existing users of Windows 95).
>
> Furthermore, Microsoft expends a significant portion of its monopoly power, which could otherwise be spent maximizing price, on imposing burdensome restrictions on its customers—and in inducing them to behave in ways—that augment and prolong that monopoly power. For example, Microsoft attaches to a Windows license conditions that restrict the ability of OEMs to promote software that Microsoft believes could weaken the applications barrier to entry. Microsoft also charges a lower price to OEMs who agree to ensure that all of their Windows machines are powerful enough to run Windows NT for Workstations. To the extent this provision induces OEMs to concentrate their efforts on the development of relatively powerful, expensive PCs, it makes OEMs less likely to pursue simultaneously the opposite path of developing "thin client" systems, which could threaten demand for Microsoft's Intel-compatible PC operating system products.[113]

112. *See* Stan J. Liebowitz, *An Expensive Pig in a Poke: Estimating the Cost of the District Court's Proposed Breakup of Microsoft*, ASS'N FOR COMPETITIVE TECH., Sept. 21, 2000 [hereinafter Liebowitz, *An Expensive Pig*].

113. *Microsoft*, 84 F. Supp. 2d at 26-28.

Knowing that its pricing is not being driven by competition on the supply-side, but solely by what the market will bear on the demand side, the fundamental problem that Microsoft sees in the market is not competing operating systems, but a low cost PC. Since there is no supply-side pressure to lower prices, Microsoft's fundamental problem is that as the total cost of the PC declines, its high prices become a problem.

> We expect <1 k PCs [PCs priced below $1,000] will be bought by consumers and business and could constitute more than 50% of all PCs by C-mass of 1998. In case we see $500 PCs next C-mass our royalties could be as high as 10% of total system prices and if the biz PC markets gets eroded by < 1k PCs we will with an NTW [NT Workstation; now called Windows 2000] solution be in the same position.[114]

Ultimately, the low-end computer is the flash point for resistance to Microsoft's pricing strategy. Microsoft recognizes that its prices make it difficult for OEMs to compete on price.

> We have shown larger than 40% growth rates annually and expect in the future that OEMs will take a very hard look in how to avoid paying us more $$ per system in order to hit most aggressive price points.[115]

The centerpiece of Microsoft's pricing strategy has been to increase operating system prices while other components of the delivered PC bundle have been falling.

> While we have increased our prices over the last 10 years other component prices have come down and continue to come down.[116]

The second memorandum, which explicitly estimates the price of operating systems, confirms this analysis. The average preinstalled price is given as $19 in 1990 and over $49 in 1996.[117] During that time span the average Microsoft revenue for preinstalled software rose from $25 to $62.[118]

Microsoft recognizes that it has been the beneficiary of volume growth created by the falling price of the PC, which masks its increasing prices. Microsoft's increasing average sales price,

114. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

115. *Id.*

116. *Id.*

117. Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

118. *Id.*

combined with increasing sales volume, has fueled its rapid revenue growth.

> OEM division revenue growth over the last 8 years has depended heavily on volume increases and a trend to higher priced OS [Operating Systems]. During that time ASPs [average sales price] have stayed stable or have gone up which made it easier to ride the wave and get the value we deserve.[119]

Thus, one of the key elements in Microsoft's business model is to bury its products in bundles. This hides the price from the public and allows Microsoft to hide behind the declining price of the total package.[120] Microsoft is committed to an operating system with a price of at least $100 and will not contemplate price cuts on the current operating system. Where Microsoft had not yet locked in prices, it would not break the pricing strategy.[121] To implement this pricing strategy, Microsoft helps stimulate shipments of high-end units. Its primary goal is to keep prices high and direct the market to high-end units and high-end Microsoft products with sustainable margins. Microsoft is determined to do everything it can to prevent the market from centering on the low-priced computer. It will not drop its price on operating systems and it intends to push it up. It will

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119. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

120. *Steady Pricing on Operating System Gives Microsoft Healthy Profit Window*, PITTSBURGH POST-GAZETTE, at E-11.

> A paradox of technology is that as product performance goes up, price comes down. Except, that is, in the world of Microsoft Corp.'s Windows operating system. Everywhere else in the computer business, from chips to disk drives, entertainment software, to routers, prices have fallen—often sharply—as companies compete fiercely for market share.
>
> Competitor and industry analysts figure that Windows 95 sells for about $45 per copy to computer makers who buy in quantity. That is the same price or slightly more than the price of its processor. . . .
>
> Compare that with what has happened to the price of an Intel chip. Intel, like Microsoft, is the leader in its market. But, Intel has tougher competition which has been driving down chip prices.
>
> Intel introduced its first Pentium processor in 1993. It has a speed of 60 megahertz, contained 3.1 million transistors and sold for $877 in quantities of 1,000. The Pentium II chip came out in 1997, running at 233 megahertz speed and with 7.5 million transistors, the electronic switches that serve as the building blocks for chips. Pentiums sold for $636 for 1,000 chip blocks are its May introduction. Now the price is $236.

Id.

121. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233) ("The answer here has to be 'no' for all people involved.").

offer incentives to OEMs to hold the line, while it seeks to build up the high end of the market. To the extent it has to, it will segment institutional markets, like academia and government, and impose strict pricing discipline. Microsoft will support expansion of the availability of PCs only at the higher end.

While Microsoft recognizes that declining PC prices have become a problem, it identifies a number of factors and strategies that will enable it to double its prices.[122] Microsoft expects that 80 million consumers will be forced to buy new computers to support its new operating systems and that a shorter PC life will also fuel consumer purchases of new systems.[123] It hopes that increasing volume will alleviate the pressures that OEMs are placing on its prices. Microsoft hopes that growing availability of stripped down computers will relieve some of the pressures to lower operating system prices. As the core of the computer becomes cheaper, the demand-side pressures will ease, which will give Microsoft the ability to keep its prices high.

> When comparing system prices over the last couple of years with today's prices we should note that in the low end segment PC manufacturers have started pulling out monitors and other items from their systems. As a result my comparisons is not 100% correct—but this does not change the trend. We have to assume that not all of the <1k PCs will be less powerful or just consumer focused. Many will be less capable as OEMs strip peripherals. We are making this easy with USB, 1394, device bay etc. Easy transfer of peripherals to new PCs could be the result and the vanilla core architecture might get artificially even cheaper. At least this would make it easier for us to defend our pricing as we increase our BOM percentage.[124]

This description of market dynamics reveals a great deal about Microsoft's view of the low end of the market. Note that Microsoft acknowledges the stripped down computer to be "consumer focused." It considers the plain vanilla core to be "artificially cheap." Supply-side pressures are forcing OEMs to cut their prices and accept only competitive returns. This is not how Microsoft behaves. Because it does not face such pressure it sees declining costs for other components as a chance to maintain and increase its own prices. Above all, it is determined to resist attempts to force it to lower its price.

122. *Id.*
123. *Id.*
124. *Id.*

It considers changes in the structure (not level) of pricing to protect its revenue. Price discrimination by computer system type is rejected because Microsoft loses control.[125] Product differentiation by reducing the value of the basic operating system and then selling additional packages is more attractive.

> This is a viable option if we can make the add-on pack a stunning piece of technology and a "must have" for every PC owner. Performance, management and ease of use features come into my mind. Again we need to start on this now in order to be ready at NT 6.0 time frame.[126]

This passage from Microsoft's memo is remarkable on two counts. First, it is particularly ironic to consider that in order to defend its pricing strategy Microsoft considers breaking apart the operating system bundle, which it otherwise claims must be kept together to preserve a uniform experience. In three sentences, Microsoft has debunked the essence of its defense to the unlawful tying allegation in the antitrust case. Second, this quotation illustrates that Microsoft's all consuming objective is keeping prices high at consumers' expense.

In fact, the whole argument of pulling out peripherals, shrinking down machines and reducing the preinstalled operating system content supports a fundamental consumer conclusion: the PC has developed to the point where it can be customized to much more effectively meet consumer needs. The PC is becoming commoditized.

The memo then offers the following observation on an important factor that contradicts these forces for increased demand: *Consumers do not actually need to upgrade their computers.*

> The only counter argument to make here is that current PC technology is totally sufficient for most office tasks and consumer desires and that any performance bottleneck is not in today's PCs but in today's COM [communications] pipes. This in itself might slow down replacement cycles and life time shortening until we find

125. *Id.*

> Both methods are an administrative nightmare for the OEMs and us. This worked when we had only 3 CPU types and the one with the higher royalty had a long cycle time—today we have too many types (I can just hear Intel calling me feeling we treat them unfairly by putting all their competitors into the low end bucket) and the cycle times are so unpredictable that we recommend against this. We have priced once on manufacturer cost and it is a sure way to totally erode your model without having any control. We rejected this as well.

Id.

126. *Id.*

> true MIPS [millions of instructions per second] eating applications—a priority not only INTEL should subscribe to.[127]

Microsoft's problem is simple. Consumers do not need high-end operating systems and the expensive machines necessary to run them. Low-cost PCs will expand the market, but will not support Microsoft's goals for revenue growth. Microsoft's answer is to render the existing base and new low-cost machines obsolete so it can sell high-end products at a greater margin.

B. Pricing Patterns

The harm to consumers resulting from Microsoft's anti-competitive and abusive business practices is most clearly evidenced in the terms and prices at which Microsoft sells operating systems to original equipment manufactures (OEMs). These terms and prices establish the baseline for how much consumers ultimately pay. Microsoft and its defenders claim that the price has been low and stable over the 1990s.[128] Some of its defenders go so far as to claim that the price of the operating system has fallen. [129] However, two internal Microsoft memoranda on the pricing of operating systems flatly contradict these claims.[130]

Historic pricing and strategic pricing plans demonstrate that operating system prices increased dramatically in the 1990s after Microsoft gained monopoly control over the operating system market (see Exhibit IV-1). This reversed strong trends established during the 1980s towards declining prices and improving quality.

The internal Microsoft analysis shows that the price of the operating system increased by almost 160% between 1990 and 1996. That is an annual increase of 17%. In contrast, between 1981, when the operating system was introduced, and 1990, when the last significant competitor was driven from the PC operating system

127. *Id.*

128. *See* LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, at 154-57.

129. *See* Stan J. Liebowitz, *A Defective Product: Consumer Groups' Study of Microsoft Pricing in Need of Recall*, COMPETITIVE ENTERPRISE INSTITUTION, Feb. 9, 1999, *at* http://www.cei.org/OnPointReader.asp?ID=603. Liebowitz analyzes the street price, not the preloaded prices of DOS/Windows, although the vast majority of operating system sales that Microsoft makes are made preloaded. *Id.*

130. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233); Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

market, the price of the operating system fell from $40 to $19.[131] That is an annual decline of 8% per year.

Not only are the claims of stable, low, and falling prices contradicted by the analysis of preloaded, wholesale prices, but retail price data presented by some Microsoft experts show that the street price has increased as well.[132] Elzinga and Mills, who cite a publicly available and consistent source for their data, show a 30% increase in the street price of the operating system—Windows including DOS.[133]

Microsoft and its defenders point to quality improvements as justification for the dramatic price increases of the 1990s.[134] Yet, the 1980s witnessed dramatic improvements in quality and prices fell nonetheless. Because of economies of scale achieved from expanding production and advances in software engineering, a competitive software market produced dramatic increases in quality and dramatically declining prices. It is the monopoly, not quality improvements, that produced rising prices in the 1990s.

This pricing also contradicts other important claims by Microsoft's defenders about pricing. *Losers* makes sweeping comparisons between prices in the early and mid-1980s and prices in the mid to late 1990s. It claims dramatically declining prices in those markets where Microsoft offers a product.[135] The analysis never considers the price of the operating system. Nor are concerns about pricing limited to operating systems. Using the leverage of the operating system monopoly, Microsoft went after the word processing and spreadsheet markets. Using similar tactics as are being litigated in the web browser case—bundling and impairing the ability of competitors to work with Windows—Microsoft captured market share equaling its operating system monopoly. A senior executive of Microsoft, pointing to the successful bundling strategy in the desktop market as a model for the browser wars, observed that Office is expensive.[136]

When this statement was made, prices were actually declining (a fact that Microsoft defenders harp on), yet this executive knew the

131. Evans et al., *supra* note 11.

132. Leibowitz, *supra* note 129, at 2. Liebowitz claims an 18% price reduction for Windows from 1990 to 1998 based on unavailable proprietary sources. *Id.*

133. Elzinga & Mills, *supra* note 11, at 51.

134. *See* Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233); *see also* Leibowitz, *supra* note 129, at 2. Both Schmalensee and Liebowitz mention the investment in quality improvement.

135. LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, 156-57.

136. United States v. Microsoft Corp., 84 F. Supp. 2d 30, 41 (D.D.C. 2000).

product was expensive. The explanation is well known. Two massive changes took place in the software market during this period to dramatically lower costs that cannot be attributed to Microsoft. First, marketing of software shifted from retail sales to wholesale (preinstallation), which dramatically reduced distribution costs. Second, the quantities of PCs shipped increased from a few million per year to well over a hundred million, which dramatically lowered average costs. Moreover, as we have seen, Microsoft prevented competing programs from being pre-installed.

> While there *are* new functions in Windows, the unit costs are spread over unit volumes that have increased dramatically, and that continue to increase perhaps 25 percent per year. Microsoft's average costs in marketing, distribution, and sales have also declined sharply. The steady increase in its unit volumes, the conversion from floppy discs to inexpensive CD-ROMs, and the shift toward PC preloading, Internet-based distribution, and high-volume corporate licensing agreements have all been driving down unit costs and driving up margins, for both Windows and Office. In fact, Microsoft profits have consistently increased much faster than its revenue over the last decade.[137]

Microsoft enjoyed the benefits of these cost reductions, but because it did not face sufficient competition, it did not pass the cost reduction through to the public. That is the sense in which it was expensive. Microsoft is actually a high-priced seller, compared to its costs, not a low-priced one. To use Microsoft's own phrase uncovered in evidence at the trial, it "rides the wave" of increasing sales of PCs and declining PC prices to keep its prices high. By comparing old apples to new oranges, the analysis presented by Microsoft's defenders has reached the wrong conclusion about Microsoft's impact in the market.[138]

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137. CHARLES H. FERGUSON, HIGH ST@KES NO PRISONERS: A WINNER'S TALE OF GREED AND GLORY IN THE INTERNET WARS 309 (Three Rivers Press ed., 1999).

138. LIEBOWITZ & MARGOLIS, LOSERS, *supra* note 12, at 154-57. Other price analyses in *Losers* are also flawed. The price of software categories in which Microsoft does not compete did not go down because there were high end, niche markets which were not subject to the economic forces we have identified in the mass, desktop market. These highly specialized programs are not amenable to pre-installation, since they are so specialized. They do not exhibit the large economies of scale because they are not mass market items.

The prices of applications that compete with Windows go down because Microsoft has bundled these with the operating system. This category is made up of utilities and communications applications, which Microsoft does not sell on a stand-alone basis. We could argue that the increase in the price of the operating system (150% over the period) was caused in part by this bundling.

It appears that Microsoft is selling suites in the range of $125 to $190 preloaded. The competitors sell suites at less than $15 preinstalled.[139] The premium is well over $100 and appears to have gotten larger, primarily because the competitors have dropped their price in an effort to stem the loss of market share.[140]

C. Estimates of Monopoly Abuse

We are concerned about market power because of the harm it does to consumers by increasing prices above competitive levels.[141] Antitrust practice considers even fairly small pricing abuse—as low as 5%—to be a source of concern if the aggregate amount of abuse is large.[142] Expert witnesses for Microsoft (Richard Schmalensee[143])

Losers argues that Microsoft should have charged more for Word for the Mac when it had a larger market share. This fails to consider key market factors that we have pointed out. It can be argued that Microsoft charged the maximum that the market will bear as determined by the market power of other component manufacturers and the elasticity of demand. In the Mac market, Mac itself has much greater market power than Microsoft and the elasticity of demand is too high.

139. Joel Brinkley, *Microsoft Has a Stronghold in Office Suites*, N.Y. TIMES, May 27, 1998, at D1-2.

> They can buy individual copies of the program for installation on some computers at a price of roughly $170 to $190. Or, they can buy the program at a far lower price, roughly $125, if they purchase it for installation on every computer in a company line. . . .
>
> As it is, Corel has changed its marketing strategy. "It's clear to us that Microsoft isn't our competition anymore," he said. "They are our environment, and we need to deal with that fact by making our product completely compatible with Microsoft Office so users can move files back and forth between their programs and ours.

Id.

140. A review from a November 1996 *PC Magazine* noted the very attractive price/quality offer being made by Microsoft's competitors. *PC Magazine* wrote the following:

> Microsoft's approximately 85 percent revenue share of the suite market has had at least one side effect: Lotus and Corel seem willing to cut prices and offer more just to grab your attention. In addition to the incredibly low upgrade price for Corel's WordPerfect Suite, the huge number of applications in its Office Professional will make you do a double take. And, with the SmartSuite upgrade's very competitive price, Lotus is getting into the act, too. Both companies seem to be reconciled to the role of "spoiler," forcing Microsoft to drop prices or sacrifice market share.
>
> In the ensuing two years, not only did Microsoft not match the price challenge, but also it increased its market share.

PC MAG., Nov. 19, 1998, at 105 (comparing Microsoft Office with its two largest competitors).

141. SCHERER & ROSS, *supra* note 15, at 70-71.

142. Roger D. Blair & Amanda Esquibel, *Some Remarks on Monopoly Leverage*, 40 ANTITRUST BULL. 371, 392 (1995) (citing William M. Landes & Richard A.

and the Government (Franklin Fisher[144]) devoted considerable attention to the question of the monopoly price of operating systems. An *amicus* brief by Litan and Noll took up the issue, as well.[145]

Robert Litan, Roger Noll, and William Nordhaus estimate that Microsoft's return on invested capital and research and development was 88% for the fiscal year ending 1999.

> Over the period 1990-98, post-tax rate of profit of U.S corporations averaged 6.7 percent per year. Using published numbers from Microsoft's financial statements, we estimate that in 1999 Microsoft's post-tax rate of profit was 88 percent. *In other words, Microsoft's rate of profit on its investment is currently more than thirteen times the average rate of profits of major U.S. corporations.* This is most impressive economic demonstration of the economic returns to monopoly that we have ever seen in a major antitrust case[146]

The implications of this analysis are staggering. If Microsoft had earned an average rate of return, its profit over the four year period, 1996-1999, would have been between $16 and $20 billion less. Keeping in mind that this is after tax dollars, the implicit excess charges to the public would be between $25 and $30 billion. This is a huge sum of excess profits.

Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937 (1981)) (giving an example using 10%).

143. Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

144. Rebuttal Testimony of Franklin Fisher taken on June 1 and 2, 1999, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

145. Remedies Brief of Amici Curiae, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

> The liability phase of the case contained a discussion of profit margins. These are not the appropriate concept for measuring monopoly profits. In competitive markets, the profit rate on investments will tend to be the opportunity cost of capital (with appropriate adjustments for differences in risk, inflation, and taxes). If a monopoly earns supranormal profits, that will be seen its rate of profits.
>
> The profit margin is equal to the rate of profit on investment times the ratio of investments to sales. The investment-sales ratio is essentially a nuisance parameter that confuses the calculation and has no particular relationship to the exercise of market or monopoly power.
>
> Therefore, in order to measure whether a monopolist has been successful in earning monopoly profits, the appropriate analytical concept it the rate of return on investment and not the profit margin.

Id.

146. *Id.* at 65.

(1) Defining and Measuring the Problem of Market Power over Price: The Lerner Index

Market power allows a firm to set price above marginal cost and achieve above-normal profits.[147] The Lerner index (L) measures the mark-up above cost resulting from market power.[148] The Lerner Index represents the ratio of the monopoly overcharge (P - MC) divided by the total price (P).

$$L = \frac{P - MC}{P}$$

The total value of the overcharge is derived by multiplying the per unit overcharge times the total number of units sold.

There are generally uncertainties about the cost data and, given Microsoft's extreme secrecy about pricing, there is even debate about price data, which is usually readily observable in the market. Therefore, economists frequently consider several other measures of monopoly profits that are the aggregate manifestation or the result of the underlying pricing abuse.

> A good long-run approximation to the Lerner index is the ratio of supra-normal profits to normal cost. This is approximated by the ratio:
>
> $$\pi_s = \frac{\text{Supra-normal profit}}{\text{Sales revenue}}$$
>
> where supra-normal profit = sales revenue—noncapital costs—depreciation—(total capital x competitive cost per unit of capital).[149]

The profit margin identified above is the abnormal profit margin earned by the monopolist. While profit margins are readily available, they present some problems.

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147. SCHERER & ROSS, *supra* note 15, at 70-71.

148. *Id.*

> Its merit is that it reflects the allocatively inefficient departure of price from marginal cost associated with monopoly. Under pure competition, M=0. The more a firm's pricing departs from the competitive norm, the higher its associated Lerner Index value. A related performance-oriented approach focuses on some measure of the net profits realized by firms or industries

Id.

149. *Id.* at 415-16.

Because the cost of capital is not recorded in firms' accounting statements and can only be imputed with difficulty, few researchers have developed accounting-based estimates of Π_S. Economists seeking to avoid this difficulty have usually opted for second-best surrogates falling into three categories.

One is the accounting rate of return on stockholders' equity:

$$\Pi_E = \frac{\text{Accounting profits to stockholders}}{\text{Book value of stockholders equity}}$$

Or on capital:

$$\Pi_C = \frac{\text{Accounting profits + interest payments}}{\text{Total Assets}}$$ [150]

Litan, Noll, and Nordhaus use the latter measure and compare Microsoft's performance to that of all nonfinancial corporations to derive their estimates of astronomical profits. Estimates of profitability based on the prior two measures and applied to a set of companies chosen to be more comparable support their conclusion.

(2) Empirical Estimates

Ideally, we would observe the price in the marketplace, estimate the cost, and calculate the index directly. Obtaining data, however, is always a problem. Historical price behavior indicates a direct correlation between competition and lower prices (See Exhibit IV-2).[151] Eliminating competition results in prices being higher than they

150. *Id.* at 416.

151. ROHM, *supra* note 63, at 85, 263-64.

> DR-DOS had Gates going ballistic when it came out with DR-DOS 5.0 in April 1990, and now only months later his sales team was locking computer makers into contracts for Microsoft's version of the product, which it had publicly stated would appear also in 1990 [It would not appear until June 1991] ....
>
> Meanwhile, in e-mail after e-mail, Gates had complained to Ballmer that DR-DOS had made it impossible for him to keep prices high. How could he continue to be profitable with DR-DOS around?
>
> A few weeks earlier Susman had deposed Gates while Palumbo had deposed Brad Chase. Microsoft's counsel Steve Holly had been present. Susman had confronted Gates with an e-mail message to Steve Ballmer in which Gates had railed on about the fact that DR-DOS was cutting into his ability to keep prices for MS-DOS high.

Rohm notes similar potential with respect to applications.

> Gates then went on to itemize the key impacts of Novell's move on each area of his business. His concern was how the merged company would impact

should. Under a worst-case scenario from a consumer perspective, the price of operating systems should have remained flat throughout the 1990s. A modest, 3% decline in prices could have been expected. We estimate a competitive price for operating systems in the range of $15-$25. We observe a price in the range of $50 to $60. Monopoly overcharges are in the range of $35-$45. Based on this estimate, the operating system is marked-up between 100 and 200%.

To calculate the total overcharges, we multiply by the number of units sold. With approximately 260 million units sold, and taking taxes into account, we estimate overcharges in the range of $12.6 to $16.2 billion. This is based on operating system sales only. The Litan et al. estimate of $25 to $30 billion would include excess from other lines of business, applications in particular.

For the purposes of estimating monopoly profits we consider five categories of companies for comparison (see Exhibit IV-3): (1) the entire computer industry; its three subgroups: (2) computer hardware and peripherals, (3) computer software, (4) semiconductors; and (5) all U.S. industry. In all comparisons, the non-Microsoft comparisons exclude Microsoft and Intel. We look at the overall industry since Microsoft has tried to claim that all elements of the computer industry are potential competitors.

Microsoft's return on equity (ROE) is much higher than that of companies in the comparison groups. It has had an ROE over 30% for the past three years and has maintained close to a 30% ROE for a decade. This return on equity is approximately twice as high as that of the industry as a whole, almost twice that earned by other software firms, and two to three times the national average.

Microsoft's profit margin is also extraordinarily high and has increased in recent years. In 1999, Microsoft had a profit margin of about 41%. This margin was about six times higher than those of the software and services sector and the hardware sector, and

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Microsoft Office, Microsoft's office productivity suite, fretting that Novell could turn its own office suite into "a serious contender which could force price and volume cuts in our office business."

Id. at 183. "By 1994, after DR-DOS was pretty much dead, Microsoft had doubled the price of DOS. There was no alternative on the market. Like a classic monopolist, once it had eliminated competition, prices soared." *Id.* at 80; *see also* Amy Cortese, *Windows: What's the Real Cost*, BUS. WK., Oct. 19, 1998, at 46; Neil Gandal, *Hedonic Price Indexes for Spreadsheets and an Empirical Test for Network Externalities*, 25 RAND J. ECON. 160, 160-70 (1994); *see generally* Erik Brynjolfson, *The Productivity Paradox*, COMM. ASS'N COMPUTING MACH., Dec. 1993.

approximately seven times the national average.[152] These extraordinary profit margins are attainable because the lack of competition allows Microsoft to maintain high prices. As a result, Microsoft pockets all of the benefits of economies of scale and scope. These benefits are not passed on to the public. Total returns to investors reflect these extremely high profit margins. Microsoft has yielded a total return to investors almost three times the national average in the decade prior to the antitrust case and 50% above the industry average.[153] Based on the profitability analysis, we arrive at a range of estimated overcharges of $10 to $20 billion.

(3) Elasticities

Because of the lack of cost data and concerns about price and profit data, economists frequently transform the price/cost analyses into other economic measures for which they have data or which they can estimate. Economists on both sides of the case have used estimates of demand elasticity to evaluate whether Microsoft has abused its monopoly power. The price cost margin can be converted to the reciprocal of the elasticity of elasticity of demand.

$$L = \frac{P - MC}{P} = \frac{1}{E}$$

Microsoft experts, inside and outside of the courtroom, applied two variants of this formula. Rather than calculate the mark-up above cost, first they estimated the monopoly price that would be charged, given the elasticity of demand.

152. *The New Microsoft*, FORTUNE, Feb. 14, 2000, at 90. A recent analysis in Fortune makes the general point in this section in stark terms. It presented Microsoft's revenues and profits broken down by divisions.

- The platforms group was attributed a profit margin of 90%. It included the operating system and is the clearest case of monopoly power.
- The remainder of the company had a profit margin of about 17%.
- This is a widely held view of the profitability of the various lines of business.

The developer groups were defined as products and services for programmers, which is clearly an area where Microsoft exercises market power since programmers are dependent on access to the operating system. It had a profit margin of 30%. The business applications group included desk top applications, where competition has been dramatically reduced in recent years, and back office server software, where competition is vigorous. It had a profit margin of 24%. The Consumer group (basically internet and cable TV products) had a net loss of 20%. The abnormal profits in operating systems and the more normal profits in other divisions reflects the market power being exercised by Microsoft. *Id.*

153. *See generally Fortune 500*, FORTUNE, Apr. 28, 1998.

$P_o = C_c / E_c - 1$

where:

P_o = Price of the operating system charged to the OEM

C_c = Competitive price of computers

E_c = Price elasticity of computers

They then took a second approach in which they included revenues from sales of complementary products, like office suites.

$P_o = C_c - R*E_c / E_c - 1$

where:

P_o = Price of the operating system charged to the OEM

C_c = Competitive price of computers

E_c = Price elasticity of computers

R = Revenue from complementary products

Schmalensee estimates market power using the Lerner Index, with and without complementary revenues (see Exhibit IV-4). He assumes that, for 1997, Microsoft is a lone monopolist charging $50 per operating system. It faces demand elasticity of 2. It has complementary net revenues from other software products sold for each computer of $100 per computer. Computers cost $2,000. Under these assumptions, he concludes that the profit-maximizing price for the operating system would be $1750. Since Microsoft actually charges only $50, Schmalensee asks, "Why Does Microsoft Charge So Little for Windows?" He concludes that the explanation is that Microsoft is not abusing its monopoly power.[154]

Fisher assumes the following for 1999. Microsoft is a lone monopolist charging $65 per operating system. It faces demand elasticity of 4. It has complementary net revenues from other software products sold for each computer of $160 per computer. Computers cost $1,000. Under these assumptions he concludes that the profit-maximizing price for the operating system would be about $100. Since Microsoft actually charges $65, Fisher shows that Microsoft is capturing a large part of the monopoly rents.[155] Fisher's analysis is much more compelling, conceptually and empirically.

First, as he notes, the antitrust issue is not whether the monopolist maximizes its profits at any moment in time, but whether

154. Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

155. Rebuttal Testimony of Franklin Fisher taken on June 1 and 2, 1999, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

it abuses its market power.[156] The court notes that Microsoft engaged in behavior to increase both short term and long term monopoly power.[157] The antitrust issue is whether the monopolist raises prices sufficiently above the competitive level to impose significant harm on the public.[158]

Second, a close look at the empirical evidence in the case, particularly Microsoft's own internal pricing strategy memoranda, shows that Fisher's analysis is much better supported by the facts. The empirical data in a Microsoft pricing memo shows linear price elasticity of about 4.[159] That is, a 1% decline in the price of computers was associated with a 4% increase in sales of preloaded operating systems. This is much larger than the highest level assumed by Schmalensee in his analysis.[160] Microsoft's complementary revenue per preloaded operating system is $5 for every $1 of preloaded revenue.[161] Its gross profit margin (pretax) is about 60%.[162] Therefore, its complementary net revenue is closer to $150 than $100.

The evidence at the trial suggests that another consideration must be added—a consideration that Microsoft takes into account in its own pricing strategy—the behavior of Intel. Intel is a "partner"—

156. *Id.*

157. *Id.*

158. Blair & Esquibel, *supra* note 142, at 392.

159. *PC Value Analysis* shows in the monopoly period—1991 to 1996—an elasticity of 4.55. More recent years show higher elasticities. Including 1990 lowers the price elasticity to 3.1. While it may be preferable to calculate elasticities based on more sophisticated data and models, this basic data is before the court as evidence. Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

160. Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233). Schmalensee's assumption that the elasticity of demand for PCs represents the elasticity of demand for an intermediate component, such as the operating system, which is a small, but growing part of the total price, can be debated, as well. For the purposes of rebuttal Fisher accepted the assumption, as does this analysis.

161. Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233). The Value Memo shows that in 1996 Microsoft sold approximately 50 million preloaded units at approximately $50 per unit, for total revenue of $2.5 billion. Its 1996 total revenues were $15 billion. Thus, it earned $5 of other revenue for each $1 of preloaded revenues.

162. Reddy et al., *supra* note 11, at 11-12. Reddy et al. assume net revenues are 67% of sales. This is a higher margin than observed in the data although it could be justified by arguing that complementary sales have lower marginal costs than the overall operations of the company. Because we have treated all revenues as complementary, it is more appropriate to use the company-wide net profit margin.

a joint monopolist—with Microsoft.[163] Microsoft compares its share in the total PC price to that of Intel. It worries about Intel trying to capture its margins and plots how to defend them. As Kempin noted, the operating system software and the CPU are intertwined, just as Microsoft and Intel are intertwined.[164]

Microsoft notes that Intel's pricing power has declined as a result of competition from other chip manufacturers, while Microsoft's pricing power in the operating system market has not.[165] Microsoft identifies two market segments in the chip market—a high priced segment and a low priced segment. Microsoft documents show that in 1996 the joint monopolists were charging a price of $286 per computer for their combined products.[166]

If we plug these observations into the formula used by Schmalensee and Fisher (as in Exhibit IV-4), we find that Microsoft has, in fact, charged prices that capture the vast majority of the monopoly rents available. In 1996, it was capturing over three-quarters of these profits, and today it is capturing virtually all of them

This analysis also explains why Microsoft is so concerned about the declining price of computers. As this price declines, Microsoft's ability to defend and expand its margins is inhibited. The Kempin Memo outlines Microsoft's strategy not only for keeping operating system prices up, but also for doubling them over the next few years.

Microsoft's experts undertake another statistical analysis.[167] They attempt to show that Microsoft acts like it faces a high elasticity of demand by deriving the market elasticity for the assumed pricing behavior.[168] Dividing the market price of the PC by the total revenue assumed per computer yields a high elasticity of 13 ($2000/$150 = 13). This is much higher than the observed market elasticity.

The assumptions derived from the Microsoft memos are much more reasonable since they yield an estimated elasticity of 4.59

163. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

164. *Id.*

165. *Id.*

166. Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

167. Reddy et al., *supra* note 11, at 3-4.

168. *Id.*

($2000/[286+150] = 4.59).[169] This is exactly the price elasticity observed in the 1991-1996 data, the period of the monopoly. If a price elasticity of 4.5 were used in the analysis summarized in Exhibit IV-4, the estimated monopoly price would be $296. This indicates that the Wintel monopoly is capturing 97% of the available economic rents.

D. Business Case Evidence Before the Court on Monopoly Power and the Benefits of Competition

The second pricing memorandum also provides insight into nature of monopoly rents being collected and the powerful effect that breaking a monopoly can have (see Exhibit IV-5).[170] The memorandum claims that Intel's CPU price increased over the 1990-1996 period. On a percentage basis, it did not increase as much as Microsoft's, but the increases were substantial, just over 100%. If competition were to break out, prices would tumble for both CPU and OS.

In fact, Microsoft notes that competition has picked up in the CPU market.

> This is particularly true for CPU prices, where AMD and CYRIX are clearly under $50/unit components with packaging COG [Cost of Goods] of $20-$25. Intel has higher costs today because of their packaging and I estimate that their current average CPU price is around $170-$180 with $40-$60 in packaging costs (so the money they are getting for their IP on silicon is $120-$140 in average, which compared with NTW prices being between $100 and $120 typically). I am interested in listening to them when they explain to us their low-end strategy in Dec.[171]

In other words, competitors are bringing CPUs to market for less than half of what Intel gets for its intellectual property (IP). Microsoft has a target price of between $100 and $120 for its operating software. Although Intel is having trouble defending its monopoly rents in the face of cost cutting competition, the target for Wintel is $270 for CPU+OS.

169. Government Exhibit #439: PC Value Analysis Cy 1990 – Cy 1996, Mar. 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

170. *Id.*

171. Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates, dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

Microsoft contemplates competition breaking out in one of two ways. Intel could bolt OS onto its CPU, squeezing out the rents from OS, but preserving its rents on CPU. Since Intel's costs were put in the $170 to $180 range, the implicit cost of a start-up operating system is in the range of $20 to $30. This is quite consistent with our conclusion that the cost of Microsoft's ongoing operating system is in the range of $15 to $25. If Intel were to take this strategy, it would squeeze out Microsoft's rents and lower the price of CPU+OS by $70 to $100.

Alternatively, Microsoft could bundle CPU with its OS, squeezing out CPU rents, but protecting its OS rents. Assuming the startup costs about $70 to $75, as previously estimated by Microsoft, it could bring the bundle to market at $170. This strategy would lower the cost of CPU + OS by $100 to $125.

Competition is "ugly" to Microsoft, but if full component competition were to break out across both the products, consumers would achieve savings of almost $200. The resulting squeeze would push the profits of both companies down to reasonable levels. Implicitly, in this analysis, Microsoft's margins are about twice as large as Intel's. If these rents were squeezed out, each of the firms would see its profit margins reduced to just slightly over the average for the rest of the computer industry.

E. Indirect Consumer Harm

There are a series of additional interrelated effects of the Microsoft monopoly that must be considered in assessing the harm it imposes on the public—severe negative effects on innovation in the industry and indirect costs imposed on consumers.

Stifling Innovation by Chilling Investment in Products That Might Compete with Microsoft's Core Products: The court noted that the repeated pattern of anti-competitive actions has a chilling effect on the companies that would enter the Intel-based PC market.

Delaying and Preventing the Development of Products: The court noted at least six instances in which Microsoft sought to delay the development of competing products. It noted several instances in which it delayed the delivery of its own products to accomplish an anti-competitive outcome.

Denying Consumers Alternatives That Would Better Suit Their Needs: Microsoft imposed strict discipline on companies shipping Windows to prevent them from altering the configuration of Windows and related icons. The court was struck by the extent to which

Microsoft was willing to inconvenience consumers to preserve its hold on the market and the inconvenience created by Microsoft's steadfast control of the boot screen. The court took special note of the fact that the OEMs were the ones who actually dealt with the public and they perceived a significant problem in Microsoft's refusal to allow modification of the boot screen. The costs they perceived were substantial.

Denying or Delaying the Introduction of Non-Microsoft Products: By denying or delaying the introduction of non-Microsoft products, Microsoft restricts consumer choice. These tactics were not restricted to the browser. There was a broad range of products that Microsoft slowed or prevented from getting to market.

Forcing Consumers to Buy Non-Microsoft Products in Inconvenient Ways: By foreclosing the primary channels of distribution with exclusive contracts and other deals, Microsoft forces consumers of non-Microsoft products to acquire them in time-consuming and inconvenient ways.

Undermining Compatibility: There were also several instances in which Microsoft undermined the ability of software applications or middleware to function properly with the operating system.

Impairing the Functionality of Microsoft Products to Defend Its Own Monopoly: Microsoft was quite willing to undermine the quality of its own and of competing products to preserve its market dominance.

Forced Upgrades and Additional Support Costs: With no competition, Microsoft upgrades, which are sold to the public, become extremely high margin products.[172] Microsoft is able to sell excessive functionality.[173] Consumers pay for more functionalities

172. Steve Lohr, *Where Microsoft Wants to Go Today*, N.Y. TIMES, June 5, 1998, at D-1 ("David Rearderman, an analyst at Nationsbanc Montgomery Securities, estimates that operating system revenues in 1997 were $4.6 billion and produced gross profit margins of 90 percent."); *see also* Denise Caruso, *Nimbly, Microsoft Has Taken Advantage of Ignorance to Reshape the World*, N.Y. TIMES, Dec. 1, 1997, at D-4 ("In contrast to product-development cycles in old-style manufacturing businesses, like automaking, extensive changes to an operating system—and the subsequent upgrades they force throughout the chain—require no costly retooling of assembly lines and no new raw materials. The main cost is human capital—some months of programmers' time.").

173. *See* Caruso, *supra* note 172.

> And Microsoft has taken brilliant advantage of that ignorance. Many people, for example, do not understand how Microsoft's business works or how it has come to dominate the software industry.
>
> The key to Microsoft's success is its strategy of linking its Windows operating systems—the foundation of a PC's operations—to its productivity applications, to

bundled into packages of software than they should and they are forced to buy bigger machines.[174] Because Microsoft does not face competition, it is does not face pressures to provide high quality products and the public is forced to purchase systems that are much buggier than they should be.

Microsoft drives a rapid product cycle[175] with inefficient software that requires bloated hardware.[176] Furgeson sums up linking the lack

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the Internet, to its consumer products, to its programming tools and to hardware manufactures in a tight, interdependent chain.

Whenever it makes a significant modification to Windows—as it did in the step from Windows 3.1 to Windows 95, for example—everything in the chain has to change, too....

Customers are caught in the competitive spiral, being constantly pressured to upgrade "obsolete" software—though the definition of obsolescence is debatable.

Id.

174. Gleick, *supra* note 72, at 83.

Anecdotally, it is clear that millions of high-end users have bought the upgrade but that millions of corporate customers have chosen to delay the inevitable heartache, particularly when most existing hardware lacks the speed and memory to run it well. It does not matter. In the long run virtually every desktop computer will run Windows 95 and its successors. New computers shipping now have Windows 95 preinstalled by default. Applications developers have either stopped developing for DOS and Windows 3.1 or soon will.

Id.

175. FERGUSON, *supra* note 137, at 309-10.

Microsoft also uses another technique, the forced upgrade cycling of its installed base, which increases its revenues but imposes huge costs on consumers by forcing them to replace their hardware more frequently than necessary. Clearly, the rapid progress of computer hardware technology helps ease the pain of the high rate of obsolescence Microsoft creates, but there is considerable pain nonetheless. The pace of updates and sheer number of new features results in the often bug-ridden bloatware that consumers and businesses are forced into accepting.

With each new round of updates, Microsoft generally discontinues or at least deemphasizes sales and support for older versions.... The introduction of backward incompatible new features, even if each feature is used by only a small percentage of users, will quickly result in a high fraction of new documents being unreadable by older versions of the application. The whole user base is therefore forced into a kind of perpetual motion machine of rapid version updating....

This forced version cycle imposes enormous costs on users that are probably beginning to approach, or even exceed, the size of the benefits discussed earlier. First, users must buy new hardware more frequently. Even larger, however, are the increased installation, service and maintenance costs imposed by this regime.

Id.

176. *Id.* at 310.

Since there is rapid technological progress in semiconductors, plus genuine competition in the hardware sector, PC costs have been flat to falling. Recently, direct and Internet retailing have further reduced manufacturing and distribution costs to extraordinarily low levels. As a result Microsoft has been able to pursue

of innovation with the distortion of the competitive process to consumer harm.

> Furthermore, too much Microsoft software is just *bad.* With some justice, Microsoft can argue that it faces unique challenges—a huge number of users running a very large number of slightly different hardware platforms in an industry with an unusually high rate of technical change. But Cisco routers have most of those characteristics, and they work much better. It is also noteworthy how often freeware outperforms Microsoft's commercial products....
>
> Microsoft's position as the monopolist purveyor of mediocre software is another source of large, and unnecessary, social costs. Training and recovery from software errors and crashes are, along with rapid version cycling, major contributors to service costs.... Conservative estimates are that the cost of maintaining a desktop is several times higher than the cost of purchasing it. Cleaner, simpler, better-designed software could reduce these overhead costs, thereby freeing large numbers of technologists to do useful work.[177]
>
> The generally accepted rule of thumb is that corporations spend three to five times their hardware costs on service. New hardware and software products must be installed, debugged and then serviced; employees must be taught how to use them. These costs increase greatly with the novelty and heterogeneity of systems in use; hence the more upgrade cycling, the higher these costs.
>
> Finally, there is Microsoft's effect upon potential and actual innovation. It is abundantly clear that any new entrant who creates a large market or a threat to Microsoft's monopoly platform position will be the object of a brutally effective, often predatory retaliation in which Microsoft will use every unfair advantage it possesses.[178]

Precise estimates of indirect costs such as these are always difficult to make. Ferguson's discussion suggests that hundreds of billions of dollars of consumer savings would result from a restoration

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its strategy without causing unacceptable increases in hardware prices. Nonetheless, even $599 PCs are probably $100 more expansive than they would be if Microsoft wrote products more carefully and without artificial feature increases. More important, people would not need to replace their computers as frequently or spend as much money servicing them. These costs affect everyone, but they probably affect poor people and the developing world more than the average business user.

Id.

177. *Id.* at 311.

178. *Id.*

of competitive processes in the industry. The reduction in direct costs resulting from the elimination of monopoly rents and excessive hardware costs are actually the smallest part of the potential savings.[179] Far larger are a more rational product cycle,[180] reduced support costs associated with less frequent upgrades and reduced instability[181] and reduced crash time.[182] Although many of the savings are indirect, they are substantial, nonetheless.[183] If one is assessing the economic impact of the Microsoft monopoly on consumers, they must be considered.

V. Antitrust Lessons for the Internet Century

A. Competition in the New Economy and the Microsoft Remedy

The business case analysis in the previous section provides a useful transition to lessons for antitrust analysis in high technology

179. Consider the following example calculation. Assume 100 million units shipped at an average hardware cost of $750 and software costs of $250. Ferguson estimates bloated hardware costs at $100 per PC. FERGUSON, *supra* note 137, at 310. Earlier, we had identified software monopoly rents in the range of $80 to $125 per PC. Assume a total of $200 savings per PC.

Current costs = $1,000/PC x 100 million PCs = $100 billion
Competitive costs = $800/PC x 100 million PCs = 80 billion
Consumer Savings = 20 billion

180. Continuing the example above, assume a 25% reduction in the product cycle.

Competitive costs = $800/PC x 100 million PCs = $80 billion
25% reduction in product cycle = $800/PC x 75 Million PCs = 60 billion
Consumer Savings = 20 billion

181. Ferguson uses a rule of thumb of support costs, primarily associated with upgrades, of 3 to 5 times the acquisition costs. *Id.* at 311. Assume the mid-point of 4 times. Further assume that support costs decline in proportion to the slowing of the upgrade cycle (25%).

Support costs = 4 x $100 billion = $400 billion
25% reduction in support equal cycle = 300 billion
Consumer Savings = 100 billion

182. Ferguson does not offer an estimate of the value of reduced crash time, he points out that other products work much better. The value of savings would be immense. For example, surveys show that consumers endure over 5 hours per month of down time due to crashes. Even reducing this by two hours per month would be worth approximately $100 billion dollars. *Id.* at 311.

2 hr/month x 12 x 300 million base = 7.2 billion hrs
Valuing each hour at $14 per hour Savings = $100 billion

183. Thus, one can quickly arrive at savings in the range of $200 billion per year, when considering the impact of the Microsoft monopoly only on the operating system and the hardware costs it is driving. The U.S. accounts for half this both because of computer purchases and intensive use of computers. *See* U.S. DEP'T. OF COMMERCE, U.S. INDUS. & TRADE OUTLOOK, ch. 27-28 (2000). For example, the U.S. accounts for just under half of all computer systems and software purchases and almost 60% of all Internet traffic. *See id.*

industries. The "bundling/bolting" strategies represent competition between layers of the dominant platform. That is, a firm that is dominant in one layer (OS) can compete at another layer (CPU), but does not lose control over the layer it dominates. It is forced to squeeze out the rents from the other layer, but is satisfied with the defense of rents in its own layer. The possibility of competition across both layers exists. If full component competition were to break out, about twice as much rent could be squeezed out.

This is, of course, what Netscape/Java threatened to do to Microsoft. By attacking from the applications layer to the operating system layer, they threatened to "commoditize" the operating system. Commoditization is the consumers' best friend, since it drives the rents out of the industry.

For proof that it is sustainable in high tech industries, we need look no farther than to another layer of the platform, the hardware layer. Microsoft's strategic analysis gives us a graphic picture of the computer as a commodity, with constant price competition, pressures on margins, rising quality and compatibility.

The Department of Justice (DOJ) and the Attorneys General proposed, and the court adopted, a "functional" divestiture with a three year transitional period of extensive conduct oversight.[184] They propose to divide Microsoft into two roughly equal companies, each owning different types of software. The Operating Company would be built around the Windows operating system. The Applications Company would be built around Office, the Internet Explorer browser, and other applications. If the break-up is not ordered, the plaintiffs recommend that the conduct oversight remain in place for ten years. This approach is cautious, but appears to be a good compromise.

Breaking up Microsoft would unleash powerful competitive market forces in the industry and send a strong message that illegal business practices will not be tolerated. The functional breakup would not fragment the operating system. The transitional conduct remedies are intended to give the new incentives a chance to take root by re-igniting the competitive process in the industry. After a short transition, there would be no regulation of either of the new companies.

The remedy attacks the key element of market power that Microsoft executives repeatedly identified and used in their business

184. Plaintiffs' Proposed Final Judgment, United States v. Microsoft Corp., 87 F. Supp. 2d 30, 44 (D.D.C. 2000) (Nos. CIV.A. 98-1232, 98-1233).

plans and strategies to undermine competition. A functional divestiture would restore the natural competitive process in the software industry. Competition builds out from a strong customer base in a complementary product. That is the competitive dynamic that existed in the mid-1990s before Microsoft "cut off its air supply."

The DOJ remedy gave considerable weight to the layer concept. The DOJ remedy does not create immediate, new competition within either the operating system or the applications layer of the PC market, but the government experts argue that it would restore the competitive dynamics of the software market.[185] It would allow and encourage competition across the two software layers. Therefore, it would allow competition to grow in the way it was developing before Microsoft's vigorous campaign to preserve its monopoly in the mid-1990s.

If this remedy were imposed, the operating system monopoly could no longer provide a basis for the abuse of market power. The applications market would become much more competitive. At the same time, by not breaking up the operating system company into competing units, the potential problem of "fragmenting" the operating system (i.e., creating incompatible versions) would be avoided.

The Applications Company could not rely on the operating system monopoly to maximize its profits. It would have to find new revenues, like developing applications for non-Microsoft operating systems (e.g., Linux), or encroaching on the operating systems market by extending the functionality of its products to become "middleware" (i.e., replicating the browser threat). It would have to be more responsive to consumer demands—improving quality and decreasing price.

With more applications available, and interoperability expanding, non-Microsoft operating systems would become more viable competitors to Windows. This would lead to more competitive pressure on the Operating Company. It could not retaliate by threatening to withhold its product or raising its prices, as it has done in the past, lest competing operating systems become more attractive to computer manufacturers and software developers, who would have a real choice in PC operating systems for the first time in years.

185. Plaintiffs' Memorandum in Support of Proposed Final Judgment, Declaration of Paul Romer, Declaration of Carl Shapiro, Declaration of Rebecca Henderson, United States v. Microsoft Corp., 87 F. Supp. 2d 30, 44 (D.D.C. 2000) (Nos. CIV. A. 98-1232, 98-1233).

This economic process would take time, but experience in the software and other high tech industries suggests that real competition would produce many integrated, consumer-friendly operating systems that perform more reliably and better meet consumer needs. In a world of competing systems, compatibility would become a highly valued commodity and open standards would be developed. Competitive industries center on standards to which all companies can develop products. Non-dominant firms strive for enhanced compatibility. The court makes this very point in dismissing Microsoft's claim that it needed to require the installation of its browser to prevent fragmentation of the Windows platform.

In a sense, the court's acceptance of the remedy tailors the principles of antitrust to the new economy. It restores the competitive process of the industry that has been assaulted by anti-competitive conduct, which is consistent with fundamental antitrust principles.

The trial had shown that Microsoft has "monopoly power" and that Microsoft's conduct plainly amounts to "a substantial antitrust violation" (see Exhibit V-1). This extent of monopolization and its abuse reflects a structural problem, not merely a problem with unacceptable conduct. The key to the monopolization offense is, in fact, that the conduct preserved or reinforced a monopoly that otherwise would have been subject to competitive threats. Under these circumstances, the leading antitrust treatise explains the obligation of the court as follows: "[o]nce a firm found to have monopoly power has committed a substantial antitrust violation the optimal solution is to break up the monopoly and make the market more structurally competitive without losing efficiencies made possible by the monopolist's size and scope."[186]

The Supreme Court has long recognized that the effective remedy to the competitive problem of the abuse of monopoly power is to terminate the monopoly itself.[187] Professor Areeda observed that the simplest and surest remedy for illegal monopolization is "the restoration of competition through dissolution or dismemberment of the monopolist into two or more viable competing units."[188]

186. PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW 207 (Supp. 1999).

187. *See e.g.*, United States v. Grinnell, 384 U.S. 563, 577 (1966) (holding that a decree should "break up or render impotent the monopoly power found to be in violation" of the antitrust laws).

188. AREEDA & HOVENKAMP, *supra* note 186.

The Supreme Court has provided clear criteria to evaluate appropriate relief for a monopolization violation.[189] Antitrust relief should "pry open to competition a market that has been closed by [a] defendant['s] illegal restraints."[190] This suggests that a remedy should not merely nibble around the edges of the monopolized market, but should kick-start competition by making sufficiently fundamental changes to allow competitors to rise or fall on their merits.[191]

The relief should "*terminate* the illegal monopoly."[192] The decree should prevent "*practices* likely to result in monopolization in the *future*."[193] The order should "*deny* to the defendant the *fruits* of its statutory violation."[194] There is little dispute that antitrust relief should avoid "transforming the district court into a regulatory agency."[195] A remedy that needs little ongoing supervision therefore is superior to one that needs extensive supervision.[196]

Identifying a set of conduct remedies that could be used to address the antitrust violation is a daunting task because so many anti-competitive aspects of Microsoft's behavior were demonstrated at trial, especially in light of Microsoft's past and ongoing behavior inside and outside of the courtroom. Having failed to convince the court that it did not do the crime, Microsoft set about trying to convince public opinion that it should not do the time. Outside of the courtroom it commissioned studies to suggest that a strong remedy would hurt the public. Relying on assumptions that have been refuted in court, Microsoft's defenders have generated huge estimates of disruption costs.[197] They assume that Microsoft has not exercised any market power in the past, but that the operating system company would start to do so after a break up. They assume the software

189. *See* Ford Motor Co. v. United States, 405 U.S. 562, 577-78 (1972).

190. *Id.*

191. *See* United States v. United Shoe Mach. Corp., 391 U.S. 244, 250 (1968).

192. *Id.* (emphasis added).

193. *Id.* (emphasis added).

194. *Id.* (emphasis added).

195. JTC Petroleum Co. v. Piasa Motor Fuels, Inc., 190 F.3d 775, 780 (7th Cir. 1999) (Posner, C.J.).

196. As the Supreme Court has observed, "the policing of an injunction would probably involve the courts and the Government in regulation of private affairs more deeply than the administration of a simple order of divestiture." United States v. DuPont & Co., 366 U.S. 316, 334 (1961); *see also* United States v. AT&T, 552 F. Supp. 131, 167-68 (1982).

197. *See* Stan J. Liebowitz, *Breaking Windows: Estimating the Cost of Breaking up Microsoft Windows*, ASS'N COMPETITIVE TECH AND THE ASCII GROUP, Apr. 30, 1999, at 10; Stan J. Liebowitz, *A Fool's Paradise: The Windows World After a Forced Breakup of Microsoft*, ASS'N COMPETITIVE TECH., Feb. 25, 2000, at 12; Liebowitz, *An Expensive Pig, supra* note 112, at 2-3.

market could not develop compatibility functionality to sustain head-to-head competition as we know it. These assumptions were discredited inside the courtroom during the trial and they are no less wrong outside the courtroom after the trial.

A conduct remedy would have to be extensive, since Microsoft has engaged in such a broad range of anti-competitive practices. The policing of the remedy would have to be aggressive, since Microsoft has shown itself to be recalcitrant both in its failure to comply with the earlier consent decree and in its steadfast denial of wrongdoing in this case. Even if Microsoft obeyed the decree, competition would be slow to take root because Microsoft has dominated the operating systems market for so long.

A comprehensive behavioral remedy would need specific provisions to address each of the anti-competitive practices that contributed to the violations of law and enforcement mechanisms that have a reasonable chance of eliciting compliance or discovering and rectifying non-compliance.

The transitional conduct remedies recommended by the court are intended to give the new incentives a chance to take root by re-igniting the competitive process in the industry. The conditions placed on Microsoft behaviors address each of the identified anti-competitive practices thoroughly.

(1) Under the Table

For certain anti-competitive practices, the Conclusions of Law stand as a remedy in themselves. The Conclusions of Law signal strongly that this conduct is not acceptable.[198] They may trigger private and class action lawsuits. These could deprive Microsoft of one of the most important fruits of its monopoly, the huge horde of cash on hand. Given the manner in which the federal case was conducted, that is the only way to get at the past fruits of monopoly conduct.

(2) Applications Barrier to Entry

Behavioral conditions, such as disclosure requirements and prohibitions on discrimination, must apply to the entire "Windows Family" and the applications built on it. They must also apply to all aspects of the interface between Microsoft and both distribution channels and other software vendors.

198. United States v. Microsoft Corp., 87 F. Supp. 2d 30 (D.D.C. 2000).

(3) Contracting

It goes without saying that exclusive arrangements should not be tolerated. However, the Court has recognized that preferential deals are a powerful tool to preserve the monopoly. A prohibition on discrimination should apply to prices, functionalities, support, testing, marketing, and other considerations that Microsoft has used to discriminate in the past.

(4) Quality Impairment

Porting of Office, disclosure of APIs and access to source code will all help diminish Microsoft's ability to impair the quality of competing or potentially competing products. A mechanism to ensure non-discriminatory access will be crucial. Microsoft should also be required to support older operating systems and to provide training on new operating systems.

(5) Bundling

Microsoft should be required to spin off the browser. This is the market that was monopolized and competition could yet be restored in it. It is also an important choke point for leveraging other Internet related markets. Other bundling issues will have to be referred to a special master. However, the Court has established a clear test. Where products can stand alone, they should be required to be offered for sale separately.

(6) Price

The conduct remedy will not place immediate downward pressure on operating system prices. Price discrimination can be eliminated with a requirement to publish a uniform pricing schedule. This will alleviate one major source of leverage over OEMs. The practice of raising the price on older versions when new ones come out should be banned. Older versions should also be supported for a period. Two-way compatibility should be maintained. This will alleviate the pressure to upgrade.

B. Antitrust Lessons Beyond the Case

While the economic literature recognizes that a large installed base may be necessary to promote economies of scale and positive network externalities, it also recognizes that large market shares sustained over long periods may be harmful. The "benefits" of having a firm that dominates an industry of this size and to this extent

are doubtful. The "winner-take-most" outcome is far less of an ironclad law than defenders of monopolies claim.[199] The claim that Schumpeterian monopoly is necessary for innovation has been challenged.[200] The empirical facts of the case also make it clear that there are other outcomes that are far more competitive and consumer-friendly.

(1) Structure

Economic theory recognizes the uncertainty of outcomes. A variety of stable market structures is possible. Technological "lock-in" may short-circuit the innovation process.[201] With the reinforcement of network effects, small advantages gained early in

199. Michael L. Katz and Carl Shapiro, *System Competition and Network Effects*, 8 J. ECON. PERSP. 93, 105-06 (1994) [hereinafter Katz & Shapiro, *System Competition*], argue that competition between incompatible systems is possible, depending on consumer heterogeneity. Paul Belleflamme, *Stable Coalition Structures with Open Membership and Asymmetric Firms*, 30 GAMES & ECON. BEHAV. 1, 1-3 (2000), and Berd Woeckener, *The Competition of User Networks: Ergodicity, Lock-ins, and Metastability*, 41 J. ECON. BEHAV. & ORG. 85, 86-87 (2000), reach a similar conclusion in a different theoretic framework. Timothy F. Bresnahan and Shane Greenstein, *Technological Competition and the Structure of the Computer Industry*, 47 J. INDUS. ECON. 1, 5-8 (1999), envision a great deal of competition within the layers of a platform and across layers in relatively short periods of time. The description of IBM's mainframe platform provided by Franklin M. Fisher, *The IBM and Microsoft Cases: What's the Difference*, 90 AM. ECON. REV., 180, 183 (1999), stresses both these points. *See also* Daniel L. Rubinfeld, *Antitrust Enforcement in Dynamic Network Industries*, 43 ANTITRUST BULL. 859, 873-75 (1998); Willow A. Sheremata, *New Issues in Competition Policy Raised by Information Technology Industries*, 43 ANTITRUST BULL. 547, 573-74 (1998) [hereinafter Sheremata, *New Issues in Competition*].

200. SCHERER & ROSS, *supra* note 15, at 660.

> Viewed in their entirety, the theory and evidence suggest a threshold concept of the most favorable climate for rapid technological change. A bit of monopoly power in the form of structural concentration is conducive to innovation, particularly *when advances in the relevant knowledge base occur slowly*. But very high concentration has a positive effect only in rare cases, and more often it is apt to retard progress by restricting the number of independent courses of initiative and by dampening firms' incentive to gain market position through accelerated R&D. Likewise, given the important role that technically *audacious newcomers* play in making radical innovations, it seems important that barriers to new entry be kept at modest level. Schumpeter was right in asserting that perfect competition has no title to being established as the model of dynamic efficiency. But his less cautious followers were wrong when they implied that powerful monopolies and tightly knit cartels had a strong claim to that title. What is needed for rapid technical progress is a subtle blend of competition and monopoly, with more emphasis in general on the former than the latter, and with the role of monopolistic elements diminishing when rich technological opportunities exist.

Id.

201. Sheremata, *Barriers to Innovation*, *supra* note 74, at 967.

the process turn into substantial leads in the marketplace.[202] The feedback process can lock in the wrong technology.[203] Once an inferior technology is "locked-in," superior technologies may be "locked-out."[204] High fixed costs and low variable costs may slow innovation.[205]

The potential for inefficiency and market failure may exist, even where positive network externalities exist. Consumer risk aversion may bias them toward known technologies.[206] A herd mentality makes it difficult for new technologies to enter the market.[207] This mentality tends to become a self-fulfilling prophecy.[208] On the supply side, sponsors and agents may play an "innocent" role in locking in the wrong technology by giving an advantage to a solution to one problem that unintentionally and inappropriately is applied to a different problem.[209] Because the inferior solution is given a head start, it takes hold.

One of the most important observations about the origins of a positive feedback process is its openness in the early stages of development.[210] In order to stimulate the complementary assets and supporting services, and to attract the necessary critical mass of customers, the technology must be open to adoption and development by both consumers and suppliers.[211] This openness captures the critical fact that demand and consumers are interrelated.[212] If the activities of firms begin to promote closed technologies,[213] this is a clear sign that motivation may have shifted.[214] While it is clear in the literature that the installed base is important, it

202. Robin Cowan, *Tortoises and Hares: Choice Among Technologies of Unknown Merit*, 101 ECON. J. 807, 808 (1991).

203. Dominique Foray, *The Dynamic Implications of Increasing Returns: Technological Change and Path Dependent Efficiency*, 15 INT'L J. INDUS. ORG. 733, 748-49 (1997); Schilling, *supra* note 41, at 268.

204. Joseph Farrel & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 RAND J. ECON. 70, 70-83 (1986).

205. *Id.*

206. Cowan, *supra* note 202, at 809.

207. *See* Yoffie, *supra* note 103, at 23.

208. Katz & Shapiro, *Antitrust and Software*, *supra* note 37, at 438-39.

209. Foray, *supra* note 203, at 745.

210. Yoffie, *supra* note 103, at 21; *see also* Bresnahan & Greenstein, *supra* note 199, at 36-37; Katz & Shapiro, *System Competition*, *supra* note 199, at 103.

211. Schilling, *supra* note 41, at 280-81.

212. Katz & Shapiro, *Antitrust in Software*, *supra* note 37, at 424.

213. *See generally*, *id.*; Jay Pil Choi, *Network Externalities, Compatibility Choice and Planned Obsolescence*, 42 J. INDUS. ECON. 167 (1994).

214. Robin Mansell, *Strategies for Maintaining Market Power in the Face of Rapidly Changing Technologies*, 31 J. ECON. ISSUES 969, 970 (1997).

is not clear that an installed base must be so large that a single firm can dominate the market. As long as platforms are open, the installed base can be fragmented and still be large.[215] In other words, a large market share is not synonymous with a large market.[216] A standard is not synonymous with a proprietary standard.[217] Open platforms and compatible products are identified as providing a basis for network effects that is at least as dynamic as closed, proprietary platforms[218] and much less prone to anti-competitive conduct.[219]

The installed base of computers is so large that it could support multiple and competing operating systems, software packages, and browsers that would be optimized to meet specific needs. Nor is there any reason to believe that the installed base will be fragmented in the sense that crossplatform applications and translations would not be available to those who value them. Microsoft's number one enemy was always compatibility that it could not control. No one ever threatened to fragment the base, what they threatened to do was migrate it to a platform that was broader and more inclusive than Microsoft's. The only threat was to Microsoft's monopoly control over the installed base.[220]

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215. Schilling, *supra* note 41, at 274.

216. Sheremata, *Barriers to Innovation*, *supra* note 74, at 965.

217. HAL VARIAN & KARL SHAPIRO, INFORMATION RULES (1999).

218. Bresnahan & Greenstein, *supra* note 199, at 36-37; Joseph Farrell & Michael L. Katz, *The Effect of Antitrust and Intellectual Property Law on Compatibility and Innovation*, 43 ANTITRUST BULL., 645, 650 (1998); Katz & Shapiro, *System Competition*, *supra* note 199, at 109-12; Carmen Matutes & Pierre Regibeau, *Mix and Match: Product Compatibility Without Network Externalities*, 19 RAND J. ECON. 221-233 (1988).

219. Mark A. Lemley & David McGowan, *Could Java Change Everything? The Competitive Propriety of a Proprietary Standard*, 43 ANTITRUST BULL. 715 (1998) [hereinafter Lemley & McGowan; *Could Java*]; Mark A. Lemley & David McGowan, *Legal Implications of Network Effects*, 86 CAL. L. REV. 479, 516-18 (1998) [hereinafter Lemley & McGowan, *Legal Implications*].

220. *Internet Tidal Wave*, *supra* note 64 (identifies cross and multi-platform applications as its fundamental challenge).

> Apple benefited by having TCP support before we did and is working hard to build a browser... from OpenDoc components. Apple will push for OpenDoc protocols to be used on the Internet, and is already offering good server configurations....
>
> Acrobat and quick time are popular on the network because they are cross platform and the readers are free....
>
> Netscape. Their browser.... They are pursuing a multi-platform strategy...
>
> Over time the shell and the browser will converge and support hierachical/listquery viewing as well as document with links viewing. The former is the structured approach and the later allows for richer presentation. We need to establish OLE protocols as the way rich documents are shared on the Internet. I am sure the OpenDoc consortium will try and block this.

Id.

The market outcome that most vigorously challenges the proprietary "winner-take-most" model is a model that centers on open standards.[221] Microsoft itself recognizes that the most important developments in computing in post mainframe environment are open standards, first the PC then the Internet.

> The Internet is the most important single development to come along since the IBM PC was introduced in 1981....
>
> The Internet's unique position arises from a number of elements. The TCP/IP protocols that define its transport level support distributed computing and scale incredibly well. The Internet Engineering Task Force (IETF) has defined an evolutionary path that will avoid it running into future problems even as virtually everyone on the planet connects up. The HTTP protocols that define HTML Web browsers are extremely simple and have allowed servers to handle incredible traffic reasonably well.[222]

Once the economic inevitability and superiority of a "winner-take-most" model is questioned, we confront the motivation to monopolize. In spite of theoretical claims that monopolists have little motivation to engage in such activities, there is ample evidence that these anti-competitive behaviors may be attractive to a new economy monopolist for a variety of reasons.[223]

- Market power in the core product can be preserved by conquering neighboring markets, raising cross-platform incompatibilities, raising rivals' costs, or preventing rivals from achieving economies of scale.
- Profits may be increased in the core product by enhanced abilities to price discriminate.
- By driving competitors out of neighboring markets, new monopolies may be created or the ability to preserve market power across generations may be enhanced by diminishing the pool of potential competitors.

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221. Lemley & McGowan, *Could Java*, *supra* note 219; Lemley & McGowan, *Legal Implications*, *supra* note 219, at 515-23.

222. *Id.*

223. *See* Katz & Shapiro, *Antitrust in Software*, *supra* note 37, at 70-80; Lansuz A. Ordover and Robert D. Willig, *Access and Bundling in High Technology Markets*, *in* COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST AND THE DIGITAL MARKETPLACE 107-08 (Jeffrey A. Eisenbach & Thomas M. Lenard eds., 1999); Rubinfeld, *supra* note 199, at 877-81; Steven C. Salop, *Using Leverage to Preserve Monopoly*, *in* COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST AND THE DIGITAL MARKETPLACE 93-96 (Jeffrey A. Eisenbach & Thomas M. Lenard eds., 1999).

In the end, economic theory does not resolve the issue, empirical facts do. We look to the empirical facts, especially corporate motivation and conduct, organized in the traditional antitrust framework. In this case they are overwhelmingly on the side of traditional market structure analysis and the antitrust laws. Despite Microsoft's claims of a new competitive dynamic in these network, new economy industries, the traditional rules of antitrust remain a solid guide to pro-innovation, procompetitive, proconsumer public policy. The warning signs remain the same.

- At the level of structure, we include the traditional warning signs of large and persistent market shares, especially across generations of intraplatform technological change and domination of multiple products within layers of a platform.
- In the high tech realm, domination of different layers of a platform and steering of consumers to specific products across layers of a platform should be a special concern. The installed base of customers at one layer provides the base to compete across layers.

(2) Conduct

Conduct and its intent should remain a central concern of antitrust authorities, notwithstanding the claim that "winner-take-most" competition justifies all tactics to eliminate the competition. Economic theory notes that it is especially critical to recognize that the entrepreneur is not passive in the positive or negative aspects of the lock-in process.[224] Sponsors have a variety of tools to create economic and entry barriers that are counterproductive. What was once the establishment of an installed base now becomes defense of market dominance that reduces competition and reinforces the "lock-out" of competing technologies. Having gained a controlling position, firms may seek to implement isolating mechanisms.[225]

Diffusion agents or technology sponsors can use a wide range of actions to advance their technology.[226] Precisely because certain

224. *See* Towhidul Islam & Miel Mead, *The Diffusion of Successive Generations of a Technology: A More General Model*, 36 TECH. FORECASTING SOC. CHANGE 389 (1997); Christos Skiadas, *Innovation Diffusion Models Expressing Asymmetry and/or Positive or Negatively Influencing Forces*, TECH. FORECASTING SOC. CHANGE 316 (1986).

225. Richard Makadok, *Can First-Mover and Early Mover Advantages Be Sustained in an Industry with Low Barriers to Entry/Imitation?*, 19 STRATEGIC MGMT. J. 683, 685 (1996).

226. Ulrich Witt, *"Lock-in" vs. "Critical Masses"–Industrial Change Under Network Externalities*, 15 INT'L J. INDUS. ORG., 753, 768-69 (1997).

characteristics of the process lend themselves to intervention by "sponsors," there is ample room for self-interested action that furthers the private sponsor's interest at the expense of the public interest.[227] The public good aspect of efforts to achieve critical mass—to organize the switch to a new technology—cannot be assumed to outweigh the private motivation in such actions.[228] Thus, a critical step is to look at actual firm behavior.[229]

A dominant firm may create barriers to entry through exclusive deals,[230] retaliation against those who deal with competitors,[231] manipulation of standards and support for competing products,[232] strategies that freeze customers,[233] and the exercise of property rights through restrictive licensing[234] patents and copyrights.[235] These business strategies create inertia and prevent competitors from gaining market share. Companies can leverage their access to customers to reinforce their market dominance.[236] This access allows them to bundle complementary assets.[237]

It is well recognized that dominant firms tend to blur distinctions between markets with bundling and integration of functions, so it is particularly important to consider the points of interface or interconnection between markets since this is where market power can be leveraged.[238] Additional control points that may emerge in the gateway to e-commerce make the market power analysis particularly important.[239] Given the threat of lock-in and the advantages of being

227. *See* Joseph Farrell & Garth Saloner, *Installed Base and Compatibility: Innovation, Product Preannouncements and Predation*, 76 AM. ECON. REV. 940, 948-51 (1986).

228. *See* Michael Katz & Carl Shapiro, *Product Innovation with Network Externalities*, 40 J.INDUS. ECON. 55, 73 (1992).

229. Robin Mansell, *Strategies for Maintaining Market Power in the Face of Rapidly Changing Technologies*, 31 J. ECON. ISSUES 969, 970 (1997).

230. *See* Schilling, *supra* note 41, at 276.

231. *See* Sheremata, *New Issues in Competition, supra* note 199, at 560-61; Glenn A. Woroch et al., *Exclusionary Behavior in the Market for Operating System Software: The Case of Microsoft, in* OPENING NETWORKS TO COMPETITION: THE REGULATION OF PRICE AND ACCESS (David Gabel & David Weiman eds., 1997).

232. *See* Sheremata, *New Issues in Competition, supra* note 199, at 560; *see also* FERGUSON, *supra* note 137, at 307; Lemley & McGowan, *Could Java, supra* note 219, at 732.

233. *See* Farrel & Katz, *supra* note 218, at 643-45; Sheremata, *New Issues in Competition, supra* note 199, at 566.

234. Katz & Shapiro, *Antitrust and Software, supra* note 37, at 75.

235. Schilling, *supra* note 41, at 279.

236. Makadok, *supra* note 225, at 693.

237. Yoffie, *supra* note 103, at 26; *see also* Robert E. Dansby & Cecilia Conrad, *Commodity Bundling*, 74 AM. ECON. REV. 377 (1984).

238. Mansell, *supra* note 229, at 977.

239. *Id.* at 982-83.

a dominant firm, the second generation of discrimination may rely on much subtler forms of discrimination.[240] This second generation of discrimination is difficult to detect and root out.

Bundling, which may play a key role in creating the critical mass for positive externalities during the early period of adoption of a technology that provides the benefit of convenience for consumers throughout the product life cycle, can also play a role in exploiting customers.[241] When combined with market power, bundling results in overpricing of products in the aggregate.[242] The conclusion is strongest with monopoly bundling, as is the case with Microsoft's browser, but extends to other situations as well.[243]

- Traditional marketing practices that tie products and predatory pricing remain a concern.
- Classic practices, such as refusal to deal with complements or competitors, retaliation for dealing with competitors, price discrimination and rebating, and foreclosure of distribution for competitors are still a cause for concern.
- In the high tech environment, manipulation of standards to disadvantage competitors or withdrawal of support for complements or competitors and lock-in contracts for core products or complements, including long terms, minimum commitments, and "preannouncement" of features to freeze customers become new concerns.
- Conduct that closes standards or frustrates cross platform compatibility and competition are the most egregious offenses, since these destroy the most dynamic economies available.

(3) Performance

Performance of the industry must be considered in terms of price,[244] innovation (quality)[245] and competitive process.[246] The

240. *See* Lopatka & Page, *supra* note 34, at 363.

241. *See* Carmen Matutes and Pierre Regibeau, *Compatibility and Bundling of Complementary Goods in a Duopoly*, 50 J. INDUS. ECON. 46 (1992).

242. Joseph P. Guiltnan, *The Price Bundling of Services: A Normative Framework*, 51 J. MKTG. 74 (1987).

243. Lester Telser, *A Theory of Monopoly of Complementary Goods*, 52 J. BUS. 211-30 (1979); Richard Schmalensee, *Gaussian Demand and Commodity Bundling*, 57 J. BUS. 211-30.

244. *See* FERGUSON, *supra* note 137, at 308-09; Sheremata, *New Issues in Competition, supra* note 199, at 560.

245. *See* HEILEMAN, *supra* note 6, at 91-93. Sheremata, *New Issues in Competition, supra* note 199, at 566, argues "[h]owever, the fact that the monopolist has innovated is not

reward for successful anti-competitive activity is the ability to impose pricing patterns on the public that exploit market power and allow the dominant firm to control the direction and pace of innovation to protect its interest.[247]

The economic literature recognizes that the introduction of, and the reliance upon, price discrimination after the initial round of positive growth is a crucial factor. Price discrimination undermines the value of existing products by creating incompatibilities.[248] This extracts consumer surplus.[249] Price discrimination allows firms to manage the cannibalization process. That is, introducing later versions of a product does not eliminate the ability to extract consumer surplus, as long as price discrimination occurs.[250] Advertising and distribution will shift in nature from an open and expansive focus to a proprietary emphasis,[251] while control over the product cycle can impose immense costs through forced upgrades.[252] Indirect costs through greater and accelerated demands on hardware may actually be several times larger than the direct costs of hardware and software.[253]

- As we have shown, traditional concerns about high and rising prices remain pertinent. Monopoly rents provide the resources to execute anti-competitive strategies and these can be measured in terms of excess profits.
- In high tech industries, compulsory and coercive upgrading policies are a concern, as they exploit switching costs to extract consumer surplus.

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the most relevant point. Most relevant to social welfare is whether the monopolist innovated more than a set of competing firms would have."

246. *See* FERGUSON, *supra* note 137, at 311 (linking the lack of competition to slowing of innovation).

247. *See* Michael Katz & Carl Shapiro, *R&D Rivalry with Licensing or Imitation*, 77 AM. ECON. REV. 403, 411 (1987); Michael Waldman, *Planned Obsolescence and the R&D Decision*, 27 RAND J. ECON. 583, 590-92 (1996).

248. Choi, *supra* note 213, at 171-73.

249. *Id.* at 176-77.

250. K. Sridhar Moorthy, *Market Segmentation, Self Selection, and Product Lines Design*, 3 MKTG. SCI. 303 (1984); Marcel Thum, *Network Externalities, Technological Progress, and the Competition of Market Contracts*, 94 INT. J. INDUS. ORG. 280, 285-86 (1997).

251. John R. Hauser & Steven M. Shugani, *Defensive Marketing Strategies*, 2 MKTG. SCI. 319 (1983) (finding a basis to decrease awareness advertising, decrease distribution budget and increase price, late in the product cycle).

252. *See* Glenn Ellison & Drew Fudenberg, *The Neo-Luddite's Lament: Excessive Upgrades in the Software Industry*, 30 RAND J. ECON. 253, 272 (2000); Drew Fudenberg & Jean Tirole, *Upgrades, Trade-ins, and Buybacks*, 28 RAND J. ECON. 235, 236 (1998).

253. *See* FERGUSON, *supra* note 137, at 309-10.

- Measuring impacts on quality and innovation is the most difficult aspect of market performance to assess. Slowing of innovation through the delay or prevention of products is one area of concern. Sloppy design and reduced or unstable performance are additional concerns.
- Creation of and/or indifference to consumer inconvenience also emerge as a concern.

It would be reasonable for antitrust officials confronted with questions about anti-competitive practices in high technology industries to act only when they observe warning signs at *each* of the levels of analysis. The Microsoft case presents mountains of evidence of many violations at *every* level. In the end, this case is not about new, high technology industries. It is about old anti-competitive business practices that have been illegal for over a century.

C. Conclusion: The Consumer Lesson of the Microsoft Case

Perhaps the most important lesson that can be learned from the court's careful consideration of the multiple forms of harm is that consumers need not fear real competition in the software industry or the new economy. Can we expect a competitive market to be as efficient and "consumer friendly" as the Microsoft monopoly?

Given the fact that Microsoft has undermined successful products from profitable companies, there is every reason to believe that consumers would receive products that are better at lower prices if the anti-competitive practices were eliminated. The ability of developers to create products that are compatible, which Microsoft then drives out of the market with anti-competitive tactics, suggests that if Microsoft were prevented from abusing its market power, a competitive market would produce compatible products. Fears that competition will cause computing to become more difficult, requiring support of multiple, incompatible applications and operating systems, are unfounded. If the installed base of more than 300 million computers were divided between competitors, interoperability would be seen as a premium quality. OEMs could purchase and choose from a number of bundles and companies could profitably write programs to any of them. Portability will be highly valued in the market.

In fact, Microsoft has fought against software compatibility in market after market. Over time, as Microsoft's market share has grown, it has built more and more barriers to interoperability between Windows and other operating systems or application

software. Microsoft is not actually concerned about incompatibility when it controls that incompatibility and it suits its business interests. The threat to the public has grown with each subsequent conquest of a market.

The ultimate irony is that Microsoft's pricing and marketing pattern imposes the greatest burden on the very consumers that it claims to be helping most with its preinstallation and bundling of software.[254] The least sophisticated consumers are the most likely to take the packages and upgrades and least likely to find the alternatives that Microsoft has driven into niches in the market. These consumers cannot find bundles that suit their limited needs, so they are forced to "buy up" both in the initial purchase and with upgrades.

At its heart, the arguments against a break-up are essentially a defense of monopoly in the industry. The trial undermines the claim that the monopoly persists because of the unique natural forces of the software market. The causes of its durability are to be found in the plain old anti-competitive business practices of Microsoft. Real competition, even in this new economy industry, is not likely to impose the costs that its critics claim; it is likely to deliver the benefits consumers have come to expect from truly competitive markets. Thus, the lesson for consumers and antitrust policy makers to be drawn from the successful prosecution of the Microsoft case is clear—antitrust properly focused on competition should be a powerful form of consumer protection in the new economy, as it was in the old.

Just over a century ago, the antitrust laws were adopted and applied when America was taking leadership of the world's industrial economy. Break-ups of the major industrial corporations at that time were intended to prevent abuse and restore competition to the most important industries of the industrial age. Claims that preventing the concentration of economic resources would hurt the economy were raised at that time and they proved to be wrong, for exactly the same reasons they are wrong today. Competition is the wellspring of economic progress and technological innovation in our capitalist economy, and antitrust law still has a critical role to play in promoting and protecting competition.

The purpose of antitrust is not to pick or punish winners, it is to ensure that the contest is fair, because only a fair contest elicits effort that gets maximum progress. By any reasonable evaluation of Microsoft's behavior, it broke the rules. The Microsoft case

254. *Id.* at 310.

represents much more than good courtroom drama. It is the first antitrust test of the new economy and it will go a long way toward determining the role of antitrust in the Internet century. Importantly, the Microsoft case teaches that classic antitrust law and trial evidence still matter.

EXHIBIT I-1:

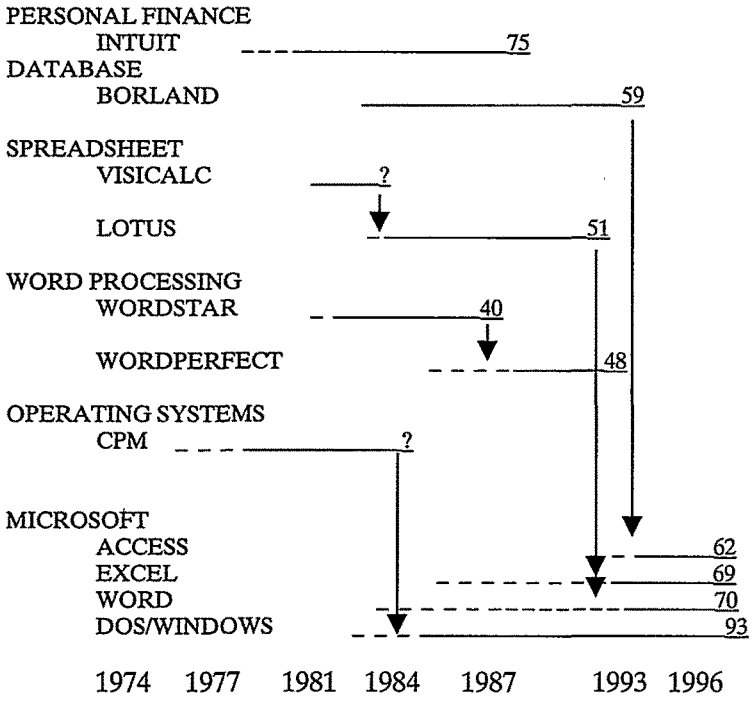
THE CASE AGAINST THE MICROSOFT MONOPOLY

	FACT (Paragraph No.)	LAW (Page No.)
MARKET STRUCUTURE		
MONOPOLY POSITION	18-21,33-35	4,5
BARRIERS TO ENTRY		
Hardware	19,20,22-27,54-55	4,6
Software	30,36-43,141,166	4,5,6
CONDUCT		
UNDER THE TABLE		
Abrogation Of Contracts	390,394	18
Intimidation	106,129,236,355	6,10
Market Division	88,105	10,22
Patent Infringement	390,394	
Reverse Bounty	139,260,2951	6,20
Predation	107,137-139,147	6,10,16,21,22
CONTRACT PROVISIONS		
Exclusive Deals	143,147,230-234, 247,259-260· 287-290,293-297,305-306,317-321, 326-326,332,337,339-340,350-352	10,15,37,38
Preferred Desktop Location	139,272,301	17, 20
Secret Price	64,118,236-238,324	6,10,11
Indirect Sales	10,19,103	4,6,10
Quality Impairment	90-92,128-129,160, 330,339-340	6,11
Resource Denial	240,357,379,396-406	31
Incompatibility/Integration	129,387-396,404-406	18,19
Disabling	160,170-172	11,31,32
Desupporting	90,122,128-129, 192,405-406	10,18
BUNDLING		
OS Tying	159, 170,198	4,11,12,31
Imitation	133-134,166	10,18,19,22
PERFORMANCE		
RETARDING INNOVATION		
Chilling Effect on Investment, Developer Time and Money	379, 397,412	
Delay or Prevent Development	411, 132,395-396	10,18,19
Netscape's Navigator	81-88,408-410	22
IBM's OS2/Smartsuite	116-118,125-130	10
Sun's JAVA	397-403	18
Real Networks	111-114	10
Apple's Quicktime	104-110	10
Intel's Native Signaling Processing	94-103	6
Undermining Compatibility	390-396, 407	6,18,19
DENIAL OF CONSUMER CHOICE		
Deny Products Consumer Needs	247, 410	
Delaying Release of Products	167-168	11
Deny Consumers User-Friendly	210-216	11
Force New Versions in New PC	57, 66	6
Deny or Delay Non-Microsoft	90-91,93	10,11

Thwart Responses to Demand	225-229	11,14
Forcing Consumers to Buy	133,143,203-20611	
In Inconvenient Ways	239-240,247,309-311, 357,359-361	10,15
DEGRADATION OF QUALITY		
Impair MS Functionality	173, 174	11
Reducing the Availability	407	18,19
Impair the Nonms Functionality	92,128-129, 160,171-172, 330,339,340	6,10,11,17,32
DIRECT INCREASES IN CONSUMER COST		
Short Term Revenue	57, 62-63	6
Price Discrimination/Secret Price	64,118,236-238,324	4,6,10,11
Undermining Long Term Competition	66	6
MONOPOLISTIC PRICING PRACTICES		
Hidden Price/Indirect Sales	10,18-19,58,103	4,6,10
Overcharges	62-63,66	6
Cross-Subsidy/Predation	107,137-139,261-262	10,21,22
Excess Profits	66,379	6
INDIRECT INCREASES IN CONSUMER COSTS		
Raising Consumer Transaction Cost	203-206, 239-240,247	11
Raising Hardware Costs		
Upgrade Policy	57,66	6
Excess Functionality	173-174,210-216	6,11,32

EXHIBIT III-1

MICROSOFT'S DOMINATION OF SOFTWARE CATEGORIES



NOTES: "- -" represents non-dominant years in market; "___ " represents dominant years in market.

SOURCE: Schmalensee, Direct Testimony, Table 2. Evans, Nichols and Reddy, *The Rise and Fall of Leaders in Personal Computer Software*

EXHIBIT III-2:
REALITY OF INSTALLED BASE OF OPERATING SYSTEMS

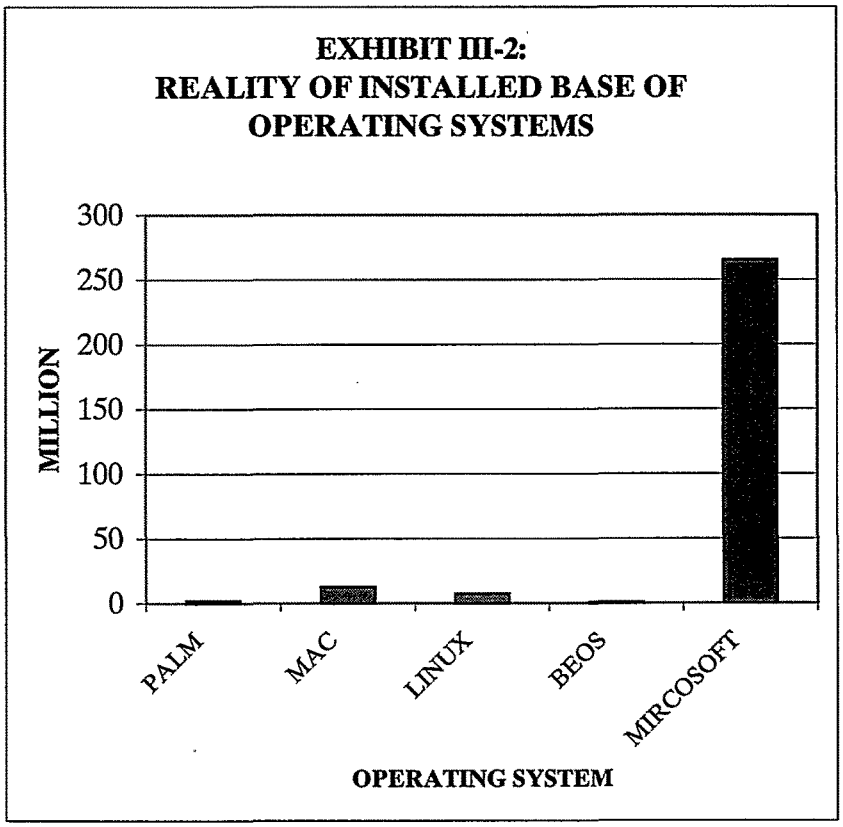


EXHIBIT IV-1:

OPERATING SYSTEM PRICES

	OEM	STREET[a]
1981[b]	$40	na
1990[c]	19	138
1996[c]	49	na
1998[d]	53	179

(a) Kenneth G. Elzinga & David E. Mills, PC SOFTWARE, Sept. 1998, at 51.
(b) David S. Evans et al., *The Rise and Fall of Leaders in Personal Computer Software*, NAT'L ECON. RESEARCH ASSOCIATES, Jan. 7, 1999, p. 4.
(c) Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates Dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).
(d) Bloomberg reports on sealed testimony in which Microsoft admits that it has ceased remitting to OEMs $4 per operating system for advertising costs. This results in an effective price increase to OEMs of $4 per system.

EXHIBIT IV-2:

IDENTIFYING MONOPOLY OVERCHARGES PRICE

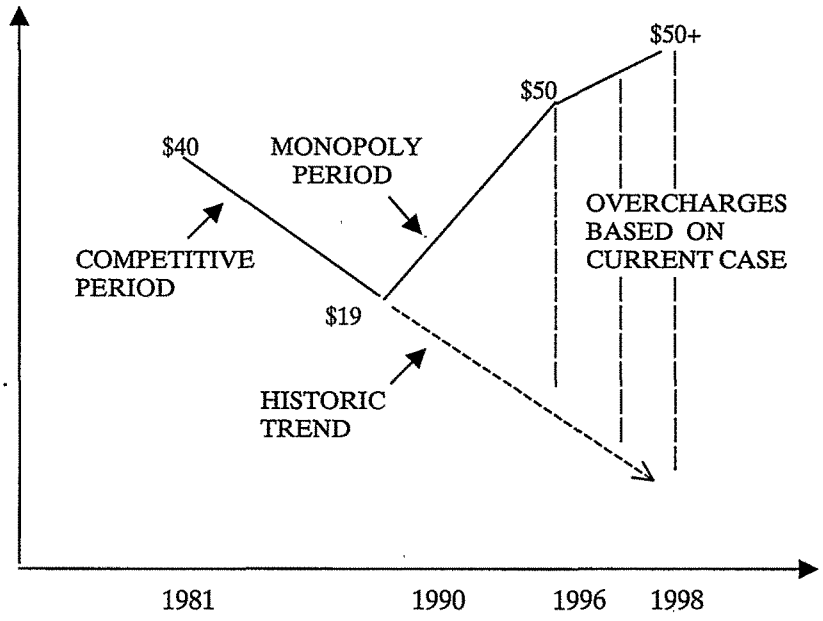


EXHIBIT IV-3:

PROFITABILITY OF THE COMPUTER INDUSTRY

	WINTEL		REMAINDER OF COMPUTER INDUSTRY				ALL
	MS	INTEL	SOFT	HARD	SEMI	ALL	INDUSTRY
RETURN ON EQUITY							
1996	32	36	18	14	17	14	17
1997	34	35	17	17	11	17	17
1998	29	28	14	14	0	12	16
1999	27	25	17	25	6	18	15
PROFIT MARGIN							
1996	26	25	6	6	3	5	6
1997	30	28	7	5	6	6	6
1998	38	23	5	4	1	4	6
1999	41	24	7	7	3	7	6

Source: BUS. WK., various issues.

EXHIBIT IV-4

THE EXTENT OF EXERCISE OF MONOPOLY PRICING POWER: ALTERNATIVE ASSUMPTIONS AND CONCLUSIONS

	Schmalensee (a)	Fisher (b)	EMPIRICAL (c) (d)		
Date for analysis	1997	1999	1996	1998	1998
CPU assumed	NA	NA	x86	High	Low
PC Price	$2000	$1000	$2000	$1500	$1000
Intel Role	None	None	Co-Monopolist		
Operating System/ CPU price	$50	$65	$286	$220	$100
Complementary Revenue	$100	$150	$150	$150	$150
Elasticity of Demand (d)	2	4	4	4	4
Profit Maximizing Monopoly Price	$1750	$98	$371	$227	$100
Actual Price as a % of Maximum Monopoly Price	3	66	77	97	100

(a) Report of Direct Testimony of Richard Schmalensee, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).
(b) Rebuttal Testimony of Franklin Fisher taken on June 1 and 2, 1999, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).
(c) Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates Dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).
(d) Government Exhibit # 439: PC Value Analysis Cy 1990 – Cy 1996, March 4, 1996, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

EXHIBIT IV-5

MICROSOFT'S STRATEGY FOR DEFENDING MONOPOLY PROFITS BY BUNDLING OPERATING SYSTEMS INTO CPU

	PRICE ESTIMATE	CONSUMER SAVINGS
Windows 2000 (W2k) Assuming Current Market Situation		
W2k (OS)	$ 100 - 120	
Intel CPU	170 - 180	
Total	$ 270 - 300	
BUNDLING/BOLTING COMPETITION		
Intel Bundles OS	200	70 - 100
or		
Microsoft Buys CPU & Bundles OS	170 - 175	100 - 125
FULL COMPONENT COMPETITION		
Competitive OS	20 - 30	80 - 90
Competitive CPU	70 - 75	100 - 105
Total	90 - 105	180 - 195

Source: Government Exhibit #365: Memorandum from Joachim Kempin to Bill Gates Dated Dec. 16, 1997, United States v. Microsoft, 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. CIV. A. 98-1232, 98-1233).

April 21, 2021

The Honorable Amy Klobuchar
Chair, Subcommittee on Antitrust, Competition Policy & Consumer Rights
U.S. Senate
425 Dirksen Senate Building
Washington, DC 20510

The Honorable Michael Lee
Ranking Minority Member, Subcommittee on Antitrust, Competition Policy & Consumer Rights
U.S. Senate
361A Russell Senate Office Building
Washington, D.C. 20510

Re: Hearing on Antitrust Applied: Examining Competition in App Stores

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Dear Senators Klobuchar and Lee,

TechFreedom has always believed that dynamism and innovation serve consumers. We write to remind your committee of the enormous value created by app stores and to counsel caution before interfering with what has been an enormous success story for both consumers and developers. Screening every app—and every update to every app—allows app stores to protect the security of users' devices, their privacy, and, indeed, their physical safety against those who might use "stalkerware" apps to track them. Screening also allows app stores to enforce the choices parents have made as to what kinds of apps and media are appropriate for their children. App stores serve society by blocking the sale of illegal drugs and the transmission of Child Sexual Abuse Material (CSAM), terrorist content, and other unlawful material. App stores can also do what the government cannot: block lawful content, such as pornography.

We urge the subcommittee, prior to considering any legislation, to bear in mind the following points: (1) app stores offer enormous benefits for consumers and developers, including protecting privacy and security; (2) the evidence indicates that app store markets are competitive, with output and consumer choices exploding while app store commissions have fallen or remained flat; (3) governmental involvement in these arrangements likely would harm

consumers by reducing the app stores' resources and incentives to protect data security and privacy, and to combat other societal threats; and (4) any legislation should await the conclusion of ongoing antitrust litigation, which will reveal whether existing app store markets are harming competition or consumers (and, if so, whether legislative changes are even necessary).

I. How App Stores Benefit Consumers and Developers

It is easy to take today's app ecosystem for granted, but a brief review of the history of the market illustrates just how much value app stores have created. Apple opened its App Store in 2008, followed just months later by Google's Play Store. These app stores created an entirely new market for mobile device software, and, more generally, revolutionized how consumers found software. App stores helped developers in five notable ways.

First, and most obviously, app stores made the distribution of software dramatically more efficient, cutting out multiple layers of middlemen. Physical distribution of software involved a manufacturer to make the disks, a packager to package them, a retailer or shipping company to distribute them to consumers and manage returns and other billing issues, and often a "publisher" who would interface up and down the distribution chain and who bore responsibility for marketing their products. Every step of the process added costs and ultimately reduced the software company's earnings. In fact, during this period, software developers typically earned, at most, 30-50% of the revenue from each sale.[1] Today, app developers typically retain 70-85% of the revenue from each sale.

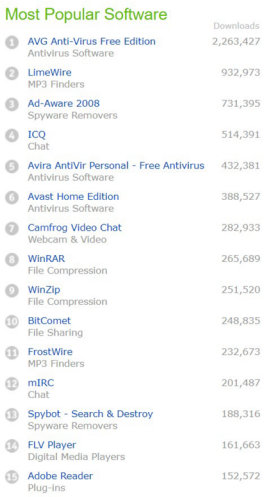
Second and more fundamentally, app stores — as integral parts of new mobile operating systems — created a wholly new market for software on impressively capable mobile devices. While Apple's business model for iOS relied primarily on sales of iPhones, revenue from its App Store was a key part of the company's prescient bet on mobile. Google gives away its Android operating system to OEMs (original equipment manufacturers) that want to make phones using it and did not sell its own Android phones until years later. For Google, revenue from the Play store has always been an important revenue stream for Android.

Third, app stores increased the size of the overall market for downloadable software from a tiny niche to something nearly every American now takes for granted every day. Much of this success was made possible by solving the most fundamental problem in the software market: trust. Any piece of code installed on a device can compromise the security of that device, allowing criminals to gain access to sensitive user data, or even seize control of a device until the user pays a ransom. Antivirus software, installed by consumers on their personal

[1] Letter from the App Association to Rhode Island State General Assembly (Mar. 26, 2021).

computers, has long been available, but offered only a partial solution to the problem: even the best antivirus program could not identify all risks in every piece of software. The market has long attempted to solve this problem by centralizing the screening of software as safe to install. In 2008, a few proto app stores existed for desktop software, most notably Download.com (founded in 1996), whose slogan—"safe, trusted, and spy-ware free"—aptly summarized what even most tech savvy, early adopters were looking for. The site screened software uploaded by developers.

A snapshot of the site on July 11, 2008—the day the iPhone App Store launched—illustrates just what a niche market this was at the time. Only one app had more than a million downloads. Not coincidentally, this was an antivirus program, as were three more of the ten most popular downloads — reflecting the clear failure in the market for cybersecurity. Despite promising users carefully screened software, Download.com struggled with its own cybersecurity: in 2011, the tool it offered users for managing downloads onto their personal computers was itself found to contain malware.[2]



Most Popular Software

		Downloads
1	AVG Anti-Virus Free Edition Antivirus Software	2,263,427
2	LimeWire MP3 Finders	932,973
3	Ad-Aware 2008 Spyware Removers	731,395
4	ICQ Chat	514,391
5	Avira AntiVir Personal - Free Antivirus Antivirus Software	432,381
6	Avast Home Edition Antivirus Software	388,527
7	Camfrog Video Chat Webcam & Video	282,933
8	WinRAR File Compression	265,689
9	WinZip File Compression	251,520
10	BitComet File Sharing	248,835
11	FrostWire MP3 Finders	232,673
12	mIRC Chat	201,487
13	Spybot - Search & Destroy Spyware Removers	188,316
14	FLV Player Digital Media Players	161,663
15	Adobe Reader Plug-ins	152,572

The limited reach of Download.com, then the leading proto app store, illustrates the state of the downloadable software market in 2008, when the vast majority of consumers continued to obtain software on physical disks purchased at bricks-and-mortar retail stores, or perhaps delivered by mail.

In 2010, Microsoft launched its own Windows Phone Store for its Windows Phone operating system, which was ultimately consolidated into a new Windows Store for both desktop and mobile apps launched in conjunction with Windows 10 in 2015.[3] Together, Apple, Google and Microsoft app stores have made it commonplace for tens of millions of Americans to download and use apps. They achieved mass-market success by solving multiple problems, on both the consumer and developer side of the market. First, app stores marked a real sea change in cybersecurity. Prior to the development of app stores, consumers had to update all their software regularly — both to obtain updated functionality and also to "patch" security issues identified in the software. This created two vulnerabilities: (i) running outdated software exposes users to attack from bad actors and (ii) every software update also exposed users to attack. App stores solved

[2] ExtremeTech, *Download.com wraps downloads in bloatware, lies about motivations*, at https://www.extremetech.com/computing/93504-download-com-wraps-downloads-in-bloatware-lies-about-motivations.

[3] The Windows Phone operating system was discontinued the following year.

both problems by allowing developers to regularly post updated versions of each app, screening each update, and pushing that updated version out to consumers, so that it would be installed automatically without need for further action by consumers (unless more tech-savvy consumers opted to decide when to update apps themselves). Today, app stores have achieved a degree of security, and thus user trust, that was previously unfathomable — while also greatly reducing the effort required from consumers.

App stores offered an additional, wholly novel dimension of trust. Previously, every online transaction exposed consumers to credit card fraud, and consumers had no easy recourse when they disputed transactions or wished to cancel a purchase. Today, each app store offers a single, integrated payment mechanism that can be used to purchase all apps and make purchases within them, and app stores will, upon request, refund some purchases.[4] While some customers may remain unsatisfied in some situations, this system is a vast improvement over previously unmediated market for downloadable software, in which consumers had no such recourse.

Fourth, besides expanding the overall size of the app market, app stores have democratized that market, allowing small developers to flourish as never before. Previously, the market was dominated by large, well-established software developers, whose reputation assured consumers that their products could be trusted not to contain malware and the company could be trusted with their credit card information. One study found that, in 2008, 71% of software downloads cost more than $25.[5] It was exceedingly difficult for small developers to achieve distribution for their products, and, given the limited scale of the market, few of the small, inexpensive apps that dominate today's app stores could survive. As *Wired* noted a year after the launch of the Apple App Store, "its method is proving far more effective than the old-fashioned computer shareware model, where developers would offer a free trial of their apps and then cross their fingers that consumers would eventually pay. The shareware model especially didn't help independent coders, whose apps got trampled on by large software companies with fatter marketing budgets."[6] As a result, app stores radically expanded the market for in-app purchases.

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[4]https://support.apple.com/en-us/HT204084; https://support.google.com/googleplay/answer/2479637?hl=en

[5] https://successfulsoftware.net/2009/04/23/the-truth-about-conversion-ratios-for-software/

[6] https://www.wired.com/2009/06/dayintech-0629/?utm_source=WIR_REG_GATE

II. How Much "Gatekeeper" Power Do Leading App Stores Really Have?

The critics of leading app stores have alleged that they exert anti-competitive "gatekeeper" power, and have thus proposed either forcing them to open their marketplaces to outside apps, app stores or payment mechanisms, or capping the percentage of revenue they earn from purchases. But if app store owners really exerted such extraordinary power, the revenue-sharing models of Apple and Google would reflect supra-market monopoly pricing — and their share of revenue would tend to rise, rather than fall, over time.

When Apple and Google launched their app stores in 2008, they had no market power. (After all, the market at issue did not exist — they invented it.) They both set their commissions at 30% — higher than the 8-12% charged by Download.com.[7] But, as we have seen, they also offered developers the potential of a vastly larger market — and succeeded wildly in delivering that market by investing in their mobile operating systems and building consumer trust in their app stores. Download.com offered only a fraction of the functionality of today's app stores: less effective screening for cybersecurity, limited, if any, screening for privacy, child protection and other issues; no automatic updating; no developer tools; and, most obviously, Download.com did not have to fund the development of any operating system. Thus, it is not surprising that Download.com's commission was a fraction of today's app stores.

Neither Apple nor Google has since raised its standard commission. Just the opposite: the revenue-sharing models for the top three app stores have evolved only to the benefit of developers. Last year, Apple reduced its commission to 15% for the first $1,000,000 in annual revenue for each developer.[8] Last month, Google followed suit, noting that this would halve commissions paid by "99% of developers globally that sell digital goods and services with Play."[9] Apple also introduced the "reader rule," which allows apps that use digital content or subscriptions purchased outside the App Store to pay zero commissions. Most recently, Microsoft has announced that a new version of its store will allow developers to use their own payment mechanisms for in-app purchases — avoiding Microsoft's revenue commission.[10]

If Google and Amazon were actually engaging in monopoly pricing, they would likely charge fees, so that free apps would have to pay something; instead, they charge only commissions on purchases. Moreover, the commissions they charge would be markedly higher than those charged by competing app stores. This would especially be true of Google, since Android

[7] https://web.archive.org/web/20071021021545/http://www.upload.com/1200-21_5-5081541.html

[8] https://developer.apple.com/app-store/small-business-program/

[9] https://android-developers.googleblog.com/2021/03/boosting-dev-success.html

[10] https://www.cnet.com/news/microsoft-is-reportedly-working-on-new-windows-10-store-app/

users can sideload, with relative ease, competing app stores while iOS users cannot. Yet market data suggests little reason for concern: Amazon's Appstore, the #4 app store as measured by number of available apps (459,167, only slightly behind the Windows Store's 669,000[11]) charges exactly the same 30% commission that Google and Apple have long charged — for both purchases of apps and also in-app purchases.[12] Unlike the market leaders, Amazon has yet to lower its commissions. Aptoide, the #5 app store measured by total downloads, should have an even stronger incentive to compete with the larger app stores by attracting developers by offering them a higher percentage of revenues — yet Aptoide charges a 25% commission.[13] This is only, in relative terms, one-sixth lower than the 30% commission charged by Google, Apple and Amazon. Aptoide's 25% commission is actually markedly higher than the 15% commission Apple and Google now charge small developers. Furthermore, in the Chinese market, where Google Play is not available but Android must nonetheless compete with the iOS China App Store, the commissions charged by alternative Android app stores often go as high as 50%.[14] In short, when compared with alternatives, the commissions charged by the largest app stores do not seem unusually high — suggesting that they do not have the gatekeeper power often alleged.

If anything, the supposed "gatekeeper" power of app stores is declining because of technological change. In the early years of app stores, "native" mobile apps offered significant advantages over reaching users through the web browser. But starting in 2015, a new generation of "progressive web applications" (PWAs) began to close the gap significantly. Today, PWAs are in many ways superior to native apps: most notably, while native apps must be designed separately for each platform, potentially doubling development costs, PWAs are designed to work with standard features available in all the leading browsers and are thus cheaper to develop. Critically, Apple began allowing PWAs in its mobile Safari browser in 2018.[15] Leading publishers, such as Twitter, Forbes, the Financial Times, the Washington Post, and AliExpress, offer PWAs so elegant that they are largely indistinguishable from native apps.[16]

The desktop has seen a similar trend. When Microsoft launched Windows 10 in 2015, the Microsoft Store was the only way to install UWP (Universal Windows Platform) apps. But in

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[11] https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/

[12] https://developer.amazon.com/support/legal/da

[13] https://en.aptoide.com/company/developers

[14] https://inc42.com/features/the-many-sides-of-google-play-stores-30-commission-indias-search-for-alternatives

[15] https://medium.com/@firt/progressive-web-apps-on-ios-are-here-d00430dee3a7

[16] https://mofluid.com/blog/10-best-progressive-web-apps/

2019, Microsoft began allowing users to change their settings to allow them to sideload UWP apps.[17] Thus, developers can now reach users directly, just as they could prior to the advent of online app stores, without having to pay any commissions to app stores.

III. Direct Threats to Privacy, Security & Child Protection

Multiple states are considering legislation that would regulate app stores — and these bills will no doubt inform the deliberations of your committee about federal legislation. While these state bills vary significantly, they generally include bans on three kinds of exclusivity, two of which are relevant here. Specifically, these bills would:

1. Require that users can install apps they download from the web, outside of an app store.[18]

2. Require OS makers to allow the installation of third-party app stores. Android and Windows can already sideload such app stores, but iOS users cannot.

The operating systems offered by Apple, Google and Microsoft cannot pre-screen apps downloaded outside their stores. Those risks are profound:

- Malware apps can compromise the security of their devices. Criminals could gain access to sensitive user data, or even seize control of a device until the user paid a ransom. Without verification by a trusted third party, this could happen with fake versions of apps consumers think they recognize, such as what appears to be the Netflix app.[19]
- Stalkerware apps are banned in app stores but can be installed on Android and Windows devices by anyone who has access to the device, even briefly; such apps can then be used to monitor their activities and even physical location without the owner's consent or knowledge. This could have literally fatal consequences, especially for people (generally women) in abusive relationships. Less tech-savvy users, especially older users, could be duped into installing either malware or stalkerware, even in scams conducted over the phone.

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[17] Hanson, *You Won't Need to Use the Microsoft Store to Install Windows 10 Apps in the Future* (May 10, 2019), at https://www.techradar.com/news/you-wont-need-to-use-the-microsoft-store-to-install-windows-10-apps-in-the-future; Wikipedia, List of mobile app distribution platforms (last visited April 20, 2021), at https://en.wikipedia.org/wiki/List_of_mobile_app_distribution_platforms#Third-party_platforms.

[18] Under a proposed bill in Rhode Island, an OS maker may not "[r]equire a developer to use a digital application distribution platform or digital transaction platform as the exclusive mode of distributing a digital product." H.B. 6055, at http://webserver.rilin.state.ri.us/BillText21/HouseText21/H6055.pdf.

[19] https://www.securityweek.com/fake-netflix-app-takes-control-android-devices

- App stores play a critical role in enabling parental controls: sideloading can enable minors, who may be more tech-savvy than their parents, to bypass parental controls and install apps their parents would not want them to use, including pornography and apps that may be used by adults to groom minors for sexual exploitation. Parental controls are even more important on mobile devices than on desktop computers because it is more difficult for parents to supervise their use, and because they can be used to track the physical location of children.
- App stores screen for various forms of unlawful and harmful content, such as sale of illegal drugs, terrorist content, and child sexual abuse material (CSAM) — protecting individual users as well as society at large from these social harms.

For users who want the ability to sideload apps, Google already offers them the freedom to take such risks. For those users — and enterprises — who prefer to avoid such risks, for themselves and their families, Apple's iOS devices offer a more secure, but restrictive, alternative. Both makers of operating systems for personal computers, Microsoft's Windows and Apple's MacOS, allow users to download software from app stores, but also to install software downloaded from the Internet. This diversity in cybersecurity is simply the market at work. It makes sense that mobile devices are more restricted: they are less capable of screening downloads through local antivirus software, and the risks involved are more significant.

Apple's prohibition on sideloading serves users in other, less obvious ways. Apple screens apps to assess how they drain the user's battery. Over time, processing-intensive apps may actually reduce total battery life. While Google and Microsoft rely primarily on third parties to manufacture the devices that use their products, Apple offers uniquely seamless integration, making all its own devices and taking complete responsibility for servicing them. Ultimately, it is Apple that must field complaints from users about the performance of their phones and Apple that must decide when to replace them. Requiring Apple to allow users to install unverified apps will necessarily change how it prices its devices or its service plans, or the terms under which devices may be serviced or replaced without additional charges. The same goes for Google and Microsoft to the extent they make, and service, their own devices.

Today, Android, Windows and MacOS users easily can enable sideloading, find any third-party app store through a simple web search, install the store with little hassle, and then use that store to install any app they want.[20] But third-party app stores present exactly the same risks to users as sideloading—unless apps are carefully screened, as Amazon attempts to do for its own Appstore for Android.

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[20] https://www.intego.com/mac-security-blog/how-to-install-applications-on-your-mac/

Requiring OS makers to include third-party app stores in their app stores, or pre-installed on their devices, would inevitably embroil regulators in thorny questions of which app stores should qualify for such mandated carriage. Regulators would be in the perverse position of *lowering*, rather than raising, the bar for cybersecurity, privacy, and child protection. These vital issues should be left to market forces.

IV. How Disrupting App Stores' Business Models Will Harm Consumers

Multiple state bills would ban a third kind of exclusivity, requiring app stores to allow app developers to use a payment system of their choosing for purchases (of paid apps and for subsequent purchases made in-app). All three of the proposed limitations on exclusivity, but especially the third, would directly undermine the business model that supports the app stores and the operating systems into which they are integrated. From the perspective of app stores, this would be equivalent to setting a price of zero for using their app store, or developing for their operating system. Attacking the business model behind app stores, whether through such limitations upon exclusivity or through direct price controls that dictate revenue splits, would ultimately harm users in multiple ways.

First, undermining the business model for app stores will necessarily undermine their ability to protect consumers. They incur significant costs to review apps. The typical app is updated roughly twice a month,[21] which means that the app store must conduct, roughly 24 times as many reviews each year as it offers apps. GetJar, the #6 app store, charges developers no commission at all, and instead earns revenue by allowing developers to pay to feature their apps, but GetJar also does markedly less screening than other app stores — if any.[22]

In addition to engineering artificial intelligence used for automated screening, Google employs over a thousand reviewers focused just on the Play Store.[23] The challenge of screening apps mounts steadily. In 2019, Google noted that, the previous year, "the number of rejected app submissions increased by more than 55 percent," and the company "increased app suspensions by more than 66 percent."[24]

It is important to note that app stores fund their overall functionality through the commissions they earn on only a small fraction of apps. Currently, 96.7% of Android apps and 92.9%

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[21] https://savvyapps.com/blog/how-often-should-you-update-your-app

[22] https://www.makeuseof.com/tag/getjar-thousands-free-apps-mobile-phone/

[23] https://kstatic.googleusercontent.com/files/de5640816a4d4099f246b64864c038fee1eac9a9e944b3f31e993e9a315d9f49aa813f27b92be0fe1070f52975476b8fa15529cc2ec314bebcde73f91331f77e, at 30.

[24] Id.

of iOS apps are free (data are not readily available on the percentage of free apps that charge for in-app purchases of additional features or content).[25] These apps receive the same benefits from the app store — screening, developer tools, a larger market, etc. — even if they do not generate purchase revenues for the app stores. Cutting app store revenue will most harm apps that do not generate revenue. App stores will likely begin to charge them fees or treat them differently.

Second, app store revenue funds the ongoing development of the app stores themselves, as well as the operating systems they are connected with. Capping revenue, or allowing developers to avoid revenue sharing, would reduce the incentive that platforms have to create, maintain, and improve these marketplaces. Perversely, potential competitors could be discouraged from developing their own app stores. App store platforms may take longer to approve new apps or to correct security flaws, thereby directly harming consumers.

Third, app store revenue allows platforms to provide developers with a variety of app development tools, including software development kits, compilers, programming languages, libraries, application programming interfaces, and app analytics. Such tools were not previously provided by proto app stores like Download.com. They can significantly lower development costs, especially for small developers.

Finally, app store revenues reduce the price that consumers would otherwise pay for devices. This is true for both Apple and Google. If Apple earns less revenue from its App Store, it will charge more for its phones (already more expensive than Android options). App store revenue is even more important for Google as the primary revenue stream for its Android operating system — half the revenue Google earns from Android overall.[26] Google does not charge any licensing fees to device makers for using Android. Allowing apps to avoid paying a commission to Google would force the company to charge device manufacturers and mobile carriers more for using Android; alternately, or in addition, Google could charge OEMs more for pre-installing a bundle of the most popular Google apps, including the Play app store (currently up to $40/device). In both cases, if app makers pay less, end users will simply have to pay more for their phones. Indeed, data suggests that Google's relatively inexpensive smartphones are particularly important in minority communities.[27] Accordingly,

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[25] See https://www.statista.com/statistics/263797/number-of-applications-for-mobile-phones/#:~:text=Free%20and%20paid%20app%20distribution%20for%20Android%20and%20iOS%202021&text=As%20of%20March%202021%2C%2096.7,of%20iOS%20apps%20were%20free.

[26] https://www.kamilfranek.com/how-google-makes-money-from-android/

[27] Joint Center for Political and Economic Studies, *For Communities of Color, Increased Smartphone Costs Mean Decreased Opportunity* (July 20, 2018), at https://jointcenter.org/for-communities-of-color-increased-smartphone-costs-mean-decreased-opportunity/.

governmental interference in these private contracts actually could result in higher upfront costs for consumers.

V. General Problems with Price Controls

Two general points must be made about price controls. First, price controls inevitably backfire: As one economist explained decades ago, "Almost every piece of price-fixing legislation produces results opposite to those intended."[28] Indeed, history is replete with examples of price controls that led to shortages, harmed consumers, and ultimately destroyed certain marketplaces entirely.

Second, any intervention likely would signal only the beginning, not the end, of Congress's efforts to micromanage these private contracts. As one economist explained, "the aggravation caused by the initial legislation generates further clamor for bigger governmental programs and stiffer Federal controls."[29] Another economist "struggled to find an example" where the removal of price controls has gone smoothly.[30] If Congress intervenes in favor of one side or another, it can rest assured that the winning side will return with higher demands in the near future, and that the losing side will not easily wave the white flag. This would not be a one-time fix.

VI. Congress Should Await Resolution of Ongoing Antitrust Litigation

As a general matter, existing antitrust laws are flexible enough to address any competitive concerns in the digital economy, including in app stores. In 2007, after three years of study, the bipartisan Antitrust Modernization Commission (AMC) endorsed the nation's existing antitrust laws. According to the AMC's chairwoman, Deborah Garza, "there was broad consensus that the economic principles on which antitrust is based do not require revision."[31] Most economists and antitrust scholars agree with this analysis.[32]

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[28] D.T. Armentano, *The Economics of Price Fixing*, Foundation for Economic Education (June 1, 1967), at https://fee.org/articles/the-economics-of-price-fixing/.

[29] *See* Armentano, *supra* at 4.

[30] The Economist, *Why Price Controls Are So Uncontrollably Persistent* (Jan. 11, 2020), at https://www.economist.com/finance-and-economics/2020/01/09/why-price-controls-are-so-uncontrollably-persistent.

[31] AMC Report, at https://govinfo.library.unt.edu/amc/report_recommendation/toc.htm. Garza, Comments Submitted to the U.S. H.R. Comm. on the Judiciary Subcomm. on Antitrust, Commercial, and Administrative Law (April 20, 2020).

[32] Agarwal, *Will the Antitrust Hearing Make Antitrust Great Again?* (July 20, 2020), at https://townhall.com/columnists/asheeshagarwal/2020/07/31/will-the-antitrust-hearing-make-antitrust-great-again-n2573488.

Indeed, even as Congress examines app store markets, the courts are considering a significant lawsuit that will shed light on whether existing app store contracts are harming consumers and the principle of competition generally. In *Epic Games v. Apple*, Epic Games, a very successful software developer, alleges that some of Apple's app store policies violate the antitrust laws and harm consumers. That case raises precisely the issues that are being debated today: notably, app store exclusivity and revenue sharing.

Any congressional action should await the results of this lawsuit. Should Epic Games prevail, its victory will show that existing antitrust law provides a remedy for competitive concerns about app store marketplaces. Should Apple prevail, and the courts find no anticompetitive harm, its victory would undercut the need for legislation. Congress should consider legislation only if the courts find that app store markets are suffering from a lack of competition, or otherwise harming consumer welfare, *and* that existing antitrust laws cannot provide an adequate remedy. Consistent with basic principles of antitrust law, Congress should enact legislation only if there is evidence that app stores are reducing consumer welfare, rather than because individual companies are earning less revenue than they would like — as is the case for every company in every industry.

VII. Conclusion

App stores play a vital role in protecting the data, privacy, and security of consumers. The evidence suggests that app store markets are very competitive, with flat or declining commissions and exploding output. If there are competitive problems in these markets that current law cannot address, the courts will tell us soon enough — and only at that point should the subcommittee consider legislation regarding app stores.