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EXAMINING REGULATORY FRAMEWORKS FOR DIGITAL CURRENCIES AND BLOCKCHAIN

HEARING

BEFORE THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

ON

EXAMINING THE DIFFERENT TYPES OF DIGITAL CURRENCIES AND THEIR INFRASTRUCTURE, THEIR APPLICATION IN THE FINANCIAL SYSTEM, AND THE POTENTIAL BENEFITS AND DETRIMENTS OF EACH

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EXAMINING REGULATORY FRAMEWORKS FOR DIGITAL CURRENCIES AND BLOCKCHAIN

TUESDAY, JULY 30, 2019

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Committee met at 10:02 a.m., in room SD–538, Dirksen Senate Office Building, Hon. Mike Crapo, Chairman of the Committee, presiding.

OPENING STATEMENT OF CHAIRMAN MIKE CRAPO

Chairman CRAPO. This hearing will come to order.

Last Congress, this Committee held two hearings examining the digital currency ecosystem.

In those hearings, we heard about some of the developments that have occurred within the digital currency marketplace since the creation of bitcoin in 2008; the potential benefits of digital currencies; and concerns about value stability, fraud and illicit uses, market manipulation, and privacy.

Since then, Facebook announced its intentions to launch a blockchain-based payment system and digital currency, libra, that will be governed by an association comprised of up to 100 financial and nonfinancial members, including Facebook's digital wallet service, Calibra.

Facebook's Libra project has generated renewed interest in digital currencies and blockchain generally, including how they interact with U.S. and international regulatory frameworks, the potential benefits and challenges they pose, and concerns around issues like anti–money-laundering and counterterrorism efforts, including data privacy, consumer protections, commerce, and monetary policy.

A few weeks ago, the head of Calibra, David Marcus, joined the Committee to provide an update on Facebook's proposed digital currency.

During that hearing, Mr. Marcus emphasized some important points and commitments, including that there are a number of regulators globally that are currently engaged on the Facebook project, including the Federal Reserve, FSOC, FinCEN, Financial Conduct Authority, the G7, and more; Calibra and the Libra Association will have the highest standards when it comes to data privacy, and no financial data or account data that is actually collected in Calibra will be shared with Facebook; and that the Libra Association will be headquartered in Geneva, Switzerland, but will still register with FinCEN and have oversight from U.S. regulators.

Though while Libra may have begun this conversation, the blockchain and cryptocurrency system is diverse. It seems to me that these technologies and other digital innovations are inevitable; they could be beneficial; and I believe the U.S. should lead in their development. That cannot happen without clear rules of the road. As the U.S. develops a more comprehensive regulatory approach, care must be taken in determining what gaps may be present in the existing framework.

In mid-July, Treasury Secretary Mnuchin said, "To be clear, the U.S. welcomes responsible innovation, including new technologies that may improve the efficiency of the financial system and expand access to financial services. That being said, with respect to Facebook's libra and other developments in cryptocurrencies, our overriding goal is to maintain the integrity of our financial system and protect it from abuse."

He also noted that Treasury has serious concerns regarding the growing misuse of digital currencies by money launderers, terrorist financiers, and other bad players.

As digital currency efforts move forward, I am particularly interested in better understanding how these technologies may impact individuals' ability to exercise control over their data, including the right to receive information about and access their data, correct inaccuracies, and delete their data.

During this hearing, I look forward to learning more about how the market for digital currencies has grown and evolved over the last decade; different types of digital currencies in the marketplace, including their differences with Facebook's proposed digital currency; how other countries are approaching the regulation of digital currencies and blockchain technology, and what we might learn from their successes and failures; potential gaps in existing regulatory frameworks; whether distributive ledger technology can help to facilitate meaningful privacy for individuals' data; and approaches Congress should consider in developing a comprehensive regulatory regime for digital currencies, including ensuring individuals have real control over their data.

With the appropriate balance of regulation, digital currencies and their innovative underlying technology could provide meaningful benefits, and I look forward to learning more about the ecosystem during this hearing.

Senator Brown.

OPENING STATEMENT OF SENATOR SHERROD BROWN

Senator BROWN. Thank you, Chairman Crapo, and welcome to our three witnesses. Thank you all for joining us, some of you more than once. Thank you.

At this Committee's hearing earlier this month, many of us of both parties, as you could hear from the Chair, voiced concerns, serious concerns about Facebook's plan to run its own currency out of a Swiss bank account.

By and large, we mostly heard deflections and dodging. It is exactly what we mean when we say Facebook does not understand accountability.

Facebook has proven over and over, through scandal after scandal, that it cannot be trusted. But they just do not care.

They move fast, they break things—you know, minor things like our political discourse and journalism and relationships and privacy. Now they want to break our currency and payment systems, hiding behind the phrase "innovation."

They want to "innovate" Americans right out of their hard-earned paychecks.

Look around at what happens with big corporations say they want to "innovate."

Before they blew up the economy in 2008, bankers were pitching an innovative new product called "subprime mortgages."

Just like Facebook, which claims its new currency will help the unbanked and the underbanked—a bit of an afterthought, I think, as they were selling it—these mortgages were supposed to help people who never had access to credit achieve the American dream of home ownership.

In reality, those mortgages ripped off millions of families who ended up losing their homes, they wrecked the economy, and they made the staggering inequality in this country even worse.

The only innovative thing about the financial crisis was how the banks managed to stick everyone else with the bill—not exactly the kind of innovation most of us were hoping for.

So I am all for innovation—especially if that innovation delivers on its promises of improving people's lives. But big tech companies and Wall Street banks are hiding behind innovation as an excuse—as an excuse—to take over important public services that we all benefit from and should all have a say in.

There are some things—our currency, our payments system, the protection of our savings accounts—that everyone in the country has a stake in. We should not be handing those kinds of public resources over to wealthy special interests so they can squeeze more profits out of ordinary Americans.

Think how hard it is to get quality service from Comcast, to know how your privacy was invaded by Facebook, or to know how much of your personal data was leaked by Equifax, and, we just learned in the last 24 hours, Capital One. And who is next? We do not know.

So we should be a little suspicious when someone tells us that only big corporations can be trusted to provide critical public services.

I recently moved into a new office. It was John Glenn's office when he, obviously, served Ohio in the Senate. And I moved there because he and Annie are long-time friends. We have known each other for 30 years. John Glenn spoke at my Eagle Scout dinner in Mansfield, Ohio, 50 years ago. But I moved into that office primarily because he was an innovator. He was the first American to orbit the Earth, as we know, as part of the Mercury Project, which would be followed by the Gemini and Apollo Missions that would eventually put Americans on the Moon. Many of us who are old enough joined in the celebrations of the 50th anniversary—at least some of us on this podium are old enough—joined in the 50th anniversary—we all did that, but we remember the day 50 years ago just this month.

None of the astronauts did it alone. It took the hard work of thousands of innovating scientists and engineers, most of them un-

known, people like famed mathematician Katherine Johnson or immigrants like engineer Miguel Hernandez. These Americans did not do it for profit. They did it to serve their country, and their successes were shared by every American who saw "U-S-A" emblazoned on the side of Apollo 11.

It is a reminder that some infrastructure works better as a public good, and we should not let big banks or big tech get their hands on those public goods.

The Federal Reserve and other watchdogs need to continue to be leaders in banking innovation.

And if we do not move quickly to improve important infrastructure—not just roads and bridges, and highways and water sewer systems, but our payments systems, too. If we do not move quickly to improve it, we will end up with big corporations that have broken our trust again and again and again, and that does not make any sense.

I look forward to hearing from our witnesses today about which of these technologies might actually help regular Americans. Thank you.

Chairman CRAPO. Thank you, Senator Brown.

Today's witnesses are Mr. Jeremy Allaire, cofounder, chairman, and CEO of Circle, on behalf of The Blockchain Association; Dr. Rebecca M. Nelson, specialist in international trade and finance at the Congressional Research Service; and Professor Mehrsa Baradaran, professor of law at the University of California Irvine School of Law.

I would like to assure each of you your written testimony has been entered into the record. We encourage you to try to follow our 5-minute rule by watching that clock in front of you so that we have time to ask you our questions. And, with that, let us begin in the order in which I introduced you. Mr. Allaire.

STATEMENT OF JEREMY ALLAIRE, COFOUNDER, CEO, AND CHAIRMAN, CIRCLE INTERNET FINANCIAL LIMITED, ON BEHALF OF THE BLOCKCHAIN ASSOCIATION

Mr. ALLAIRE. Thank you, Chairman Crapo, Ranking Member Brown, and the Members of the Committee. It is my pleasure to appear before you today to testify about the promise of digital assets and blockchain technology.

I have spent the past 25 years helping building internet technology platforms and companies in the United States, serving millions of businesses and hundreds of millions of consumers. In 2013, I cofounded Circle, a global digital currency company, seeking to make it much easier for people and businesses everywhere to create and exchange value with the same ease that we create and share information and content on the internet.

I would like to start by touching on some of the challenges I see in the global financial system today. Billions of people lack basic access to financial services. Those who do have access face a system with exorbitant fees and excessive risk.

Our banking system is riddled with money laundering and crime, with annual illicit proceeds laundered through our financial system exceeding $2 trillion, and with 99 percent of laundering going undetected.

Our financial system is also overwhelmed with privacy violations and data breaches. Cybercriminals and hostile Nations continue to take aim at our financial infrastructure. The costs of this are spiraling, and the situation seems to be getting worse.

Access to capital for small businesses is extremely limited, with capital markets reserved for only the largest companies and those with access to venture capital, and very few people have a chance to even invest in these startup companies.

There absolutely can be a better future ahead, one built on digital assets and blockchains. These technologies represent one of the most significant innovations in modern history. I believe that blockchains and digital assets will be viewed as more impactful than the rise of joint stock corporations, double entry bookkeeping, and modern banking.

In the coming decade, we will see a series of profound changes. Digital currencies will proliferate and become usable by billions of people on mobile devices. Payments will become a commodity free service on the internet. A new set of internet-based global capital markets built on digital assets will emerge, opening up capital markets for businesses and investors everywhere, scaling from today's thousands of companies to a world where every person and business can directly access global capital markets with the same ease that they access e-commerce marketplaces.

Commerce relationships will increasingly be running on blockchains, providing a commerce environment with greater security, efficiency, transparency, and enforceability, and new decentralized forms of digital identity will become available, allowing for much safer use of digital services and which will radically improve our privacy while more effectively thwarting financial crime. As a new fundamental layer of internet infrastructure, blockchains will transform the global economic system.

With respect to the policy and regulatory issues facing the world, with the growth in digital assets, there are significant issues at stake. In the United States, regulatory uncertainty and the application of laws that do not contemplate digital assets has led to the loss of significant opportunity. The Securities and Exchange Commission, for example, is forced to apply Federal laws written in the 20th century to technologies created in the 21st. This has had a material impact on the competitiveness of U.S. companies, with Asian-based companies beginning to dominate the market, and is backward—rather than forward—looking. Congress should consider new laws that protect consumers while not causing companies to fixate on nearly century-old definitions.

The result of the uncertain and restrictive regulatory environment has led many digital asset projects and companies to domicile outside of the United States and to block U.S. persons and businesses from accessing products and technologies. In Circle's case, we have received a license under Bermuda's forward-looking Digital Asset Business Act, which provides a comprehensive regulatory framework for companies in the industry, and we are in the process of moving our international-facing products and services out of the United States.

It is vital that we allow innovators room to grow in the United States. Congress should adopt national policies that define and es-

tablish digital assets as a new asset class, including appropriate rules and exemptions. Without a national policy framework for digital assets, I am concerned that the United States will not be the world leader in this critical new technology, that it will continue to fall behind, and that it will not fully reap the benefits of economic transformation that digital assets will bring.

Thank you for your increased interest and attention to this significant area of opportunity, and I look forward to hearing your questions and opinions.

Chairman CRAPO. Thank you, Mr. Allaire.

Dr. Nelson.

STATEMENT OF REBECCA M. NELSON, SPECIALIST IN INTERNATIONAL TRADE AND FINANCE, CONGRESSIONAL RESEARCH SERVICE

Ms. NELSON. Good morning, Chairman Crapo, Ranking Member Brown, and Members of the Committee. Thank you for inviting the Congressional Research Service to testify on "Examining Regulatory Frameworks for Digital Currencies and Blockchain". My testimony focuses on the international landscape of digital currencies. I will summarize my statement with these brief remarks.

In 2009, bitcoin was launched as the first cryptocurrency. Cryptocurrencies are digital representations of value. They are generally administered using distributed ledger technology and have no status as legal tender. Cryptocurrencies strive to make payments cheaper and faster. Today more than 2,200 cryptocurrencies are in circulation. In terms of market size, however, cryptocurrencies are a small niche market.

Some central banks and large multinational corporations are looking to take cryptocurrencies into the mainstream. If these initiatives move forward, there could be numerous policy implications for the United States, including for its financial stability, the role of the U.S. dollar, consumer protections, money laundering, privacy considerations, and sanctions policy.

I will make three points today: first, the patchwork of cryptocurrency regulations around the world; second, the growing interest of central banks in cryptocurrencies; and, third, Facebook as a potential game changer for the market.

The first point is the patchwork of cryptocurrency regulations emerging around the world. Cryptocurrencies are international in nature, but they are regulated by Governments at the national level. There are more than 190 countries in the world, and they are taking different approaches to the regulatory issues presented by cryptocurrencies. For example, cryptocurrency regulations have focused on permitted uses, consumer protections, securities regulations, licensing and reporting requirements, anti–money-laundering regulations, and tax treatment.

Broadly speaking, Government approaches fall across the spectrum. At one end of the spectrum, some countries, such as Malta, Singapore, and Switzerland, are striving to become cryptocurrency hubs. They view cryptocurrencies as a potential source of growth, and they actively attract cryptocurrencies with favorable regulation and tax regimes.

At the other end of the spectrum, some countries, including China, India, Egypt, and Taiwan, have banned or strongly restricted cryptocurrencies. Their concerns focus on Government control of the financial sector, financial stability, and consumer protection.

In the middle of the spectrum, some Governments are allowing the development of cryptocurrencies while developing regulations to minimize risk. Most major developed economies, including the United States and the United Kingdom, have adopted this approach.

Differences in financial regulations across countries can lead to instability, especially if cryptocurrencies are adopted on a larger scale.

The second point is that some central banks are exploring the creation of their own cryptocurrencies. Some countries plan to develop cryptocurrencies as a second legal tender. For example, the Marshall Islands is planning to create a cryptocurrency called the "sovereign" to raise Government revenue. Venezuela launched the petro, a cryptocurrency backed by oil, as a way to raise money and evade sanctions. Iran and Russia are also reportedly considering cryptocurrencies, at least in part to avoid sanctions.

Other Governments are considering making digital versions of their existing fiat currencies directly available to individuals. For example, Sweden's e-krona project strives to reduce its reliance on private payment processing companies.

The policy implications of such initiatives for the United States would largely depend on which countries are involved and how the new currencies are structured. The central banks of most major developed countries are refraining from such initiatives at this time.

The third point is that Facebook has the potential to be a game changer for cryptocurrencies. In June, Facebook announced its proposal for a new global cryptocurrency, the libra, to be used by billions of people. The libra would be backed by a reserve fund of safe assets denominated in a basket of currencies. The Libra Association, the nonprofit to oversee the currency, is headquartered in Switzerland. Many of the details about how the libra would operate remain uncertain.

The libra has raised a number of questions due to Facebook's lack of experience in the banking sector, the size of Facebook's network, and concerns about Facebook's handling of user data. There are also questions about who would regulate it and how.

Earlier this month, the G7 finance ministers and central bank Governors agreed that the libra raises regulatory and systemic concerns as well as wider policy issues that would need to be addressed before the project is implemented.

Mr. Chairman, this concludes my brief remarks. Thank you again for the opportunity to testify, and I look forward to the Committee's questions.

Chairman CRAPO. Thank you, Dr. Nelson.

Professor Baradaran.

STATEMENT OF MEHRSA BARADARAN, PROFESSOR OF LAW, UNIVERSITY OF CALIFORNIA IRVINE SCHOOL OF LAW

Ms. BARADARAN. Thank you. Chairman Crapo, Ranking Member Brown, and Members of the Committee, thank you for the opportunity to testify today.

In the aftermath of the 2008 financial crisis, many Americans were frustrated with our banking industry that had engaged in reckless risk-taking and predatory practices that harmed their customers. They were frustrated again by Government bailouts that seemed to save just the perpetrators of the crisis. Is it any wonder that, as so many people lost trust in the system, they enthusiastically embraced bitcoin, a new alternative, nonsovereign currency introduced on the heels of the crisis to respond to the very problems of the financial sector, which, as Mr. Allaire wrote, is rigged against average people.

I wholeheartedly agree with these concerns. I have spent my career trying to bring attention to issues of inequality and exclusion in banking. While I am glad the cryptocurrency industry aspires to help the unbanked, I do not believe that in the United States this is the best solution to the problem. The blockchain ledger is a big technological leap forward, but problems of exclusion and financial marginalization in our financial system are not a result of faulty technology but faulty policy.

One stated goal of bitcoin and digital currencies is to establish an efficient and public payments system available to all. In fact, Congress already established a public payments system: the Federal Reserve. The Fed's exclusive charter is to serve the public interest and to increase the integrity, efficiency, and equity of U.S. payments. The Federal Reserve can and should seek to open its payments system to all Americans. Currently, the payments system is only open to banks. Even mobile apps and FinTech providers have to go through a bank. But for a host of reasons, banks are not serving low-income and low-profit customers and communities. As a result, a quarter, 25 percent, of Americans are unbanked or underbanked. These low-income families spend billions of dollars and valuable time paying for checks to be cashed, refilling prepaid debit cards, and paying bills in person. Practically speaking, the most direct path to financial inclusion is by opening the doors to our already established payments system. It can and must be updated, but the system is secure, handles millions of transactions a day, is accepted by all merchants, and is widely understood.

The alternative path to financial inclusion through cryptocurrency relies on waiting for entirely new currencies to be developed on new and untested technological platforms, waiting for wholesale adoption and use, and then waiting for technological advances to penetrate banking deserts, all while unbanked populations continue to spend hard-earned wages in fees.

And even if technological solutions are right around the corner and we decide that this is the answer to financial inclusion, we would be reserving the highly subsidized and public Federal banking system for those with enough means to be banked and relegating the unbanked to the private cryptocurrency markets. This is undemocratic and unfair. The Federal Reserve and this Congress are in the best position to make this possible by offering real-time

payments and retail point-of-contact operations, such as a post office checking account.

As far as regulating these cryptocurrencies, I ask that Congress and regulators approach these financial products with a healthy bit of caution. It is the innovator's job to imagine a bright and better new world of disruption and change that will benefit everyone. It is a regulator's role to imagine what could go wrong to create systemwide crisis that could hurt everyone. When it comes to regulating finance, an ounce of prevention is much better than a $1 trillion bailout.

As innovators look forward, regulators and Congress must make sure that we have learned the lessons of recent history. Though no one wants to stifle innovation or to see the U.S. lose its competitive edge, we should remember that much of the deregulation that led to the financial crisis was justified on these very same worries. Just two examples.

The derivatives market was deregulated because industry experts promised that innovative and complicated new products hedged risks. Investment banks and regulators relied on very sophisticated mathematical risk models for risk management instead of old and outdated rules. Not wanting to stifle innovation, derivatives were deregulated in 2002, which led to a $600 trillion market that no one was watching too closely. As financial regulators discovered in 2008, the complex risk model had not hedged its risks at all but had merely placed many of them on books of their counterparties. The entire sector was exposed. The innovation, the math, and the technology was not the problem. The problem was the humans.

Similar promises and assumptions were made about the new and innovative money markets in the 1980s that were also similarly deregulated. Money markets were pegged to the dollar one to one, just as libra and digital fiat currencies are. They promised to be stable and liquid and not susceptible to runs. And they were fine until they broke the buck and threatened a potentially catastrophic run. The Treasury had to step in the guarantee these markets.

Cryptocurrencies create new money-like instruments that are tradable and have inherent value. This is not significantly different from derivatives markets, commercial paper markets, repo markets, even historic markets and private bank notes. These shadow banking markets were unregulated for too long and created big problems. So far, none of the cryptocurrencies have reached the level of scale where they would present a systemic threat. But if their ambitions are believed, they will. And we have regulators for that that should look to the safety and soundness of the financial sector.

Technology has and will continue to fundamentally transform finance, but there has yet to be an innovative technology that has eliminated the risks and frauds and crimes that financial regulation is meant to combat, despite many promises to the contrary. Cryptocurrencies are either a store of value, tradable currencies, investments, commodities, or a payments system, or as some have promised, they are all of these things. There is nothing about all of these things being put on the blockchain that makes it any less

likely that it could lead to systemic risk, fraud, insider trading, criminal activity, panics, bubbles, et cetera.

If our securities or commodities or banking laws have become outdated or unnecessary, or if Congress believes that they are too cumbersome, then they should be repealed or changed for all applicable parties, not just newcomers. Technology and innovation cannot undermine public policy.

Thank you.

Chairman CRAPO. Thank you, professor.

I may use my first section of time to talk to you, Mr. Allaire. It has been 10 years now since bitcoin was first issued, and the digital currency marketplace has evolved and grown, I think one of you said, to 2,200 currencies right now, cryptocurrencies right now.

Given this innovation and their complexity, it can be difficult to understand the differences between products and their benefits and the challenges that are raised for a regulatory climate. Mr. Allaire, how can the U.S. develop a more comprehensive approach to digital currency and blockchain regulation while still acknowledging the unique aspects of different projects?

Mr. ALLAIRE. Thank you, Senator. I think your comment is very accurate in that we have seen tremendous development over that period of time. As noted in my testimony, there are over 2,300 different digital assets that are available publicly in some form.

In my testimony I do outline in great detail the kind of different categories of digital assets. It is very easy when one hears about bitcoin or libra to sort of assume this is all the same stuff. And so I think one of the very first things for regulators and policymakers is to really distinguish between the different types of digital assets that are emerging. We see obviously these kind of nonsovereign digital monies like bitcoin. There are dozens of others like that that have a focus on kind of privacy—preserving, you know, transmission of value. They implicitly have a kind of monetary policy associated with them, and these kind of new commodity monies need to be regulated as we have regulated other commodity monies, with appropriate types of financial crimes controls, as we have seen put forward with FinCEN and FATF guidance.

But, also, there are, I think, new things that happen in this space. The firms that store these assets, these are effectively digital bearer instruments, so not unlike diamonds or gold or some other bearer instrument, but they are digital, which makes them very, very attractive to people who might want to steal them; hence, there has been so much activity around theft on these kinds of cryptographically secured assets. And so regulations around the custody of digital assets is a really critical need and is something that a number of jurisdictions have actually put forward and built very specific rules around how do we custody these types of digital assets.

I think as I have also talked about, you know, some of the most innovative technology in this field are what I call blockchain platforms, and these are really general purpose infrastructures for recordkeeping, transaction processing, writing code that executes different types of contracts, and this is, I think, one of the most important breakthroughs that we have seen, frankly, in the history of modern computing and ultimately can lead to things like secure

voting, new forms of governance mechanisms within firms, as well as innovations in financial assets.

These types of assets I think have the broadest applicability and should be encouraged in their development, I think in the same way that we encourage the rapid development of technical standards that made the commercial internet flourish.

Chairman CRAPO. Let me interrupt and ask a further question. As I understand it, it has been recently that Poloniex, the subsidiary of Circle, transferred its registration to Bermuda, and in that process it was cited that there was regulatory uncertainty in the United States, which was a primary motivating factor. Could you explain that a little better?

Mr. ALLAIRE. Yes, absolutely. I think the really critical issue is that many of these digital assets do not easily fit classifications that we have had in our financial system. We would like to say, oh, this is like a currency or this is like a commodity that you would use or utilize in some way, or this has some feature that maybe makes it look like an investment contract.

Many digital assets have features of all three. It is what makes digital assets, I think, very innovative, is that you can construct an asset that simultaneously incentives capital, incentivizes customer behavior, provides value in terms of access to goods or services and payments. And that is a breakthrough in how we can develop corporate forms. It is a breakthrough in how we can incentivize and develop businesses and technologies.

Unfortunately, in the United States, the guidance that the SEC has given is extremely, let us just say, narrow in terms of what they would deem to not be a security. The vast majority of digital assets, if they were, in fact, treated as securities, as the Howey test application and the most recent staff guidance provides, effectively would mean that those are not accessible to U.S. persons because the utility value of the asset would not be possible to function if it is treated as a security.

So there is a fundamental mismatch between the regulatory structure and guidance that we have here and the nature of these digital assets, and so markets around the world are adopting these in not just Bermuda but Singapore, Switzerland, even jurisdictions like France introducing tailor-purposed definitions of digital assets so that issuers can feel comfortable with their obligations, there are investor protections associated with those, and security and the like, but which do not try and jam these into the respective classifications we have today.

Chairman CRAPO. So my time has expired, but to be sure I understand your point here, as a part of our policy approach, you are suggesting we should not regulate this set of innovations as securities?

Mr. ALLAIRE. To the contrary.

Chairman CRAPO. Or you should?

Mr. ALLAIRE. So I am sorry. I misunderstood the question. Yes, we should regulate these. I believe we need new definitions of digital assets as a new asset class, and that there are circumstances where there are investment protection considerations. There are trading and market considerations. There are also circumstances

that have to do with utility, commodity, and end-user usage, and you have to be able to define these in a way where that can work.

Chairman CRAPO. All right. Thank you.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman.

Professor Baradaran, welcome, and congratulations on your move to Irvine.

Ms. BARADARAN. Thank you very much.

Senator BROWN. You seem like you might be skeptical of Facebook claims of 2 weeks ago in this Committee like the one that it is barging ahead with an innovation that will serve the unbanked and underbanked. If you can kind of cite some history when innovators, financial service companies, others said that they wanted to bank the unbanked and the underbanked, and what actually happened with those kind of innovative financial services products.

Ms. BARADARAN. Yeah, this is not the first time we have heard that the main—as Calibra says, their fundamental mission is to serve the unbanked and underbanked, and I have heard this a lot from the cryptoindustry over the past decade. We heard access to credit being offered earlier. And one of the ways that that was offered was in the subprime crisis. So the idea was we are going to lower underwriting standards, and we are going to do the subprime market, the mortgage-backed securities market, and the CDO market. And one of the main justifications was to provide access to credit, to increase financial inclusion. With the tech companies, some of the FinTech companies, as well, they usually list that as a prime issue.

Senator BROWN. Thank you.

Mr. Allaire, to address this, I would like you to—is there any reason to treat cryptocurrencies and other financial services offered on blockchain, to treat them differently than the products that have existed? I want you to answer, Professor Baradaran—you spoke to it a bit—and hear your thoughts on treating them differently from what we have done over the years.

Ms. BARADARAN. I mean, blockchain is new technology, absolutely. It is amazing. And maybe we will all be on it soon. That is all fine. But what we are talking about is the digital assets. I mean, this hearing is about the value created, the assets on the blockchain. And so it is sort of a red herring to just talk about the blockchain technology. We need to be talking about what actually is going on in these markets.

And so I do not think there is any reason to put—whatever we are going to call it, whether it is an investment, a currency, some product of value, it does not matter what technology undergirds it. What matters is the risks presented by this, and there is nothing about the blockchain that diminishes these risks like any of the other sort of models that we had previously. That is not something that fundamentally changes the things that regulations are meant to combat.

Senator BROWN. Discuss your skepticism that technology alone, like Facebook, libra, or cryptocurrencies, can address unequal access.

Ms. BARADARAN. I mean, the problems of the unbanked, like I said, are not technological problems. They are policy problems. We have the technology to provide an ATM and a debit card to people. The most popular product for unbanked communities is a debit card. What they need to do is to take their cash—their paychecks, to cash it someplace, right? So they need a safe and secure place to store their money, and usually people want something old and dusty, like a bank, as opposed to some new startup to invest all their life savings in.

So they need somewhere to save their money. They need a way to engage in digital commerce. So we have all of these banking deserts, especially in rural places, and all we need to do is allow some bank, some access for that point of contact cash digital, and none of these cryptocurrencies can do that until there is wide-scale adoption, and this currency would be acceptable by every single point, node, that these people are using these payments. And that is just—it may happen, but there are many easier ways to do it.

Senator BROWN. You compare cryptocurrencies in some ways with going back to the gold standard. Some at the Fed have commented on that. Why is that a problem?

Ms. BARADARAN. Well, you know, like Mr. Allaire said, his company is a minority in this field. Most of it wants to rewrite monetary policy and go back to relitigate those debates about whether fiat currency is a good idea. Our Federal Reserve has a charter to create elastic currency. That is a debate that we have litigated in this Congress, and if we want to relitigate the merits of gold versus fiat, this would be the place to do it, not at some startup.

So what is happening in the bitcoin and the cryptocurrency market is a lot of these companies just want to create an alternative to the U.S. currency, to the U.S. dollar. And I understand their frustrations. I cannot imagine this body would want to delegate that money-making authority to the private market.

Senator BROWN. Thank you. Mr. Chairman, I will just close. Your comments about the Federal Reserve I think rang true, that they have the authority and the ability to modernize our payments system, and I am worried that if they do not move quickly, Facebook or Wall Street or some tech company will use it to squeeze more profits from hardworking families and community banks and will break that critical public infrastructure. So thanks for your comments.

Ms. BARADARAN. Thank you.

Chairman CRAPO. Thank you.

Senator Warner.

Senator WARNER. Thank you, Mr. Chairman. I want to say I really appreciate the fact that you and Ranking Member Brown have had this second hearing on this issue. I think it is really important.

I do think, you know, blockchain, distributed ledger technology, as the professor indicated and Mr. Allaire indicated, has great potential. I am a little intrigued that we are basically almost 10 years into this, and even in countries that have not had the kind of regulatory oversight we have had, we have not really seen a full breakout. You know, I would like to get to that at some point.

I want to start, though, with the professor. One of the things that Mr. Marcus from Facebook said at the previous hearing is that if we are going to go with libra, there was going to in a sense be a one-to-one relationship. To me that does sound a little bit like gold standard. And, you know, what would be the effect if this were to become an extraordinarily popular currency? How could this association, the Libra Association, acquire and hold onto enough assets to be able to allow that one-to-one? I would love to have a brief comment from everybody on this.

Ms. BARADARAN. It does seem like the gold standard or like the money markets, but one of the things that differentiates us is every time we in the United States have had a gold standard, it was still backed to money created by the Government. So we have never had a pure gold standard, and this is what Libra would advise. And so you would have this bucket of currencies that would be worldwide. So what happens if everyone in Greece all of a sudden invests in libra? That would sort of destabilize the U.S. dollar. So if we are going to have a basket of currencies and no sort of central issuer, there are potential problems. I am not saying they cannot be solved, but——

Senator WARNER. But wouldn't you also have to have, you know, in a sense, enough basket of currencies that would be available on almost an as-needed basis——

Ms. BARADARAN. Yes.

Senator WARNER. And, again, if you are talking not millions or billions but hundreds of billions or trillions potentially, Mr. Allaire, do you think that really is what Marcus meant, that there would be a literal one-to-one?

Mr. ALLAIRE. Yes, thank you, Senator. My understanding is that, yes, it is a one-to-one based on a mixture of reserve currencies that they would ultimately specify.

I would like to comment on this particular topic. I think it is critical, which is, you know, the first wave of these private monies, like bitcoin, decentralized private monies, were very much focused on establishing a global digital currency with a very specific monetary policy ideology. And those will continue to grow and very likely flourish to the degree that people are interested in pursuing that form of store of value.

However, the critical mainstream use cases for the financial services sector built on blockchains has really required the development of what we refer to and the industry refers to as these "stable value token" or "stable coins," libra being an example of that. But these have been around for a number of years, and 2 years ago, with one of the other leading companies in the industry, Coinbase, we created a consortium to develop an open standard for stable value currencies to work on blockchains, and we launched in Q4 of last year the U.S. dollar coin, which is not a basket. It is U.S. dollar coin, and it is a one-for-one backing model as well.

Senator WARNER. I still do not understand how you fully aggregate that one-to-one backing, but I want to get to a couple more questions quickly.

One is, you know, if you have got—if the libra approach has got a basket of currencies, don't you have currency risk there? And if

you have got currency risks, shouldn't there be, again, some additional at least information in terms of consumer protections?

Ms. BARADARAN. Absolutely. There is currency risk, and there is also the same risk of the shadow banking market created, right? So the commercial paper markets and the repo markets and the money markets, these were all dollar-denominated currencies. They were not new currencies. But there is new money and value creation in a different format, and this is exactly what we have here. And not to say that, you know, they would not have 100 percent reserves, just to say what is the point, right? We have U.S. dollars. If we want more of them, the Fed could do that.

Senator WARNER. It also seemed to me a little bit—if you have 100 percent reserves, where is Libra going to make money on this if you have got that maintenance of that backstop all the time?

Mr. Allaire, I have got only a few seconds left. I am open on this question around, you know, tokens vis-a-vis securities. You have said there ought to be a new framework, a new structure. Where would you put the regulatory authority in the United States if you were to be able to wave that magic wand?

Mr. ALLAIRE. Sure. My recommendation would be the development of a national policy on digital assets, definitions of digital assets, specific rules and exemptions around those, and have a single supervisor over the firms that are regulated.

Senator WARNER. That is easy to say that, but you did not answer my question. Would you create a whole new regulatory system for digital assets? Or are you going to pick—and I have run out of time. The Chairman is giving me a second. Where would you place this within our existing regulatory structure, or would you create something brand new?

Mr. ALLAIRE. It is a very good question, Senator. I am certainly not an expert on the efficacies of the different regulatory agencies, financial regulatory agencies and how to best organize those.

Senator WARNER. Thank you. I do think the question about why there has not been a breakout beyond digital currency is something I would love to get an answer to as well. Thank you.

Chairman CRAPO. Thank you.

Senator Schatz.

Senator SCHATZ. Thank you, Mr. Chairman. Thank you to the testifiers.

Professor Baradaran, I want to ask you about the Federal law that says that only the Government can mint a coin. And, of course, the reason it was written that way is because that was the only way that it could be conceived that an entity could create a currency. And so the basic question is: Knowing that, OK, only the Government can mint a coin, but these people are trying to do something that sort of rhymes with that, although it seems to comply with the statutory language, which is old, what do we do now?

Ms. BARADARAN. Yeah, so I do want to differentiate that, like Mr. Allaire said, not all cryptocurrencies want to establish new alternative currencies, but certainly the majority of the market, which is bitcoin, does. And we do have laws against this. And I want to be clear that we created these laws because we had problems. We have had problems of private issuance of coins. The U.K. had the Stamp Act before that. So we have experienced what it is like to

have alternative currencies, and we have purposefully put that power in the Federal Government.

Senator SCHATZ. Mr. Allaire, I want to see if I can find an area of agreement between you and the professor, but I do not have a lot of time. So here is the thing: It sounds like you think this will democratize the use of financial products. But I am sort of stuck on what she said and tend to agree with what she said, which is to say that there is a much more straightforward way to do that. There are public policy proposals all the time. There are things that our regulators could do under existing statute to democratize the process and to decentralize the process.

And so what I am trying to get at is: Do you really think that in a society in which only 81 percent of the public currently has a smartphone, we are anywhere close to democratizing the use of these products? I mean, what it sounds like to me is tech people wanting to wave a wand and skip a bunch of steps and avoid the tough politics of doing things for people and saying we have got a new tech that will solve all this stuff.

So I am just wondering whether you want to speak to the limitations societally of what you are doing. I do not doubt the importance of the technology or that we will probably all be using it in two decades. But I think that that is a different assertion than, oh, and by the way, it is going to solve all these other societal ills. Go ahead.

Mr. ALLAIRE. Well, first, you know, I think the motivations for founding this company in particular, Circle, and I think a lot of the entrepreneurs, computer scientists, economists, cryptographers, and others that work in this field is not focused on financial wizardry and how to, you know, get rich quick. There is certainly a fair share of that. It is focused on how do we build a new global infrastructure for economic activity.

Senator SCHATZ. OK, but what do you do about like—just as a start, 19 percent of the American public does not have access to the device that you would use to execute a transaction. And what do you do about the fact that adoption is nowhere near universal? Are we just sort of supposed to place our bet on this tech as solving a bunch of problems and leaping over all the existing ones?

Mr. ALLAIRE. No, I do not think so at all. I think, you know, first of all, these technologies develop over time. In 1998, well, the internet existed but no one had broadband access. You know, personal computers were relatively new in terms of their adoption. Should we not have focused on innovating and building the cloud infrastructure, higher-speed internet connections, come up with policies that encourage broadband adoption? Should we not have made those investments and policy choices?

Senator SCHATZ. No, but since you are asking the question, let me answer the question. The important thing here is to understand what this tech does and what it does not do, because if we are going to establish a regulatory framework for this tech, we need to not be so triumphant about all the problems that it is going to solve. But we also have to be clear-eyed about the problems it may create, but also the potential for it.

And so when tech executives and their funders talk as though all of societal ills will be solved by a new code, you will forgive us if

we are little bit skeptical about all of that. I do not doubt the potential for this tech. I just do not think it is actually going to bank low-income communities. And I do not think you have persuaded anybody here that it is going to do so.

Mr. ALLAIRE. So there is no silver bullet from technology, very clearly. These are human issues, and there are real policies issues. I think the risks that we have to address in the financial system, whether it is access, criminal abuse, data security, privacy, those exist significantly. This technology actually, you know, does provide an avenue to improve upon those. But there is no silver bullet here. This is people who have to build and innovate and collaborate with policymakers.

Senator SCHATZ. And I will take the professor's answer for the record, if you do not mind.

Thank you.

Chairman CRAPO. Thank you.

Senator Cortez Masto.

Senator CORTEZ MASTO. Thank you. Thank you, Chairman Crapo and Ranking Member Brown, for this important discussion. And thank you all for being here.

Let me follow up on that, and let me start with you, Mr. Allaire. I do think that blockchain technology, there is potential for it. It is the future. It is a platform that has the ability to transform so many sectors of this country from what we are right now, the financial sector, to the energy sector, to health care records, to everything. I think there is potential here, and it is not going to go away. It is something we have to address, because if we as a country do not lead in this technology, China or some other country is going to do so.

So, Mr. Allaire, let me talk to you about this, because you talked about defining digital assets. When you are talking about that, are you only talking about it as it pertains to the financial sector? Or are you looking at other potential areas where blockchain can be used in our economy?

Mr. ALLAIRE. Thank you, Senator. You know, in my written testimony, I talk about this category of digital assets which are often called, you know, "tokens" or "tokenized digital assets".

Senator CORTEZ MASTO. So that is just as it refers to cryptocurrency, some sort of currency?

Mr. ALLAIRE. It is not necessarily. So you may have a token that represents boats. You may have tokens that are, you know, associated with health care records, as you said. You know, the breakthrough here is that we have a public, secure, tamper-proof infrastructure that is evolving and emerging for recordkeeping and processing of data that is more resilient and ultimately more private than some of the infrastructures that we have today, and that can be applied in many industries in many significant ways.

A lot of the innovations that are happening with these digital assets that are built on blockchains may have some fundamental utility within an industry, a business, a product, a service. But that digital asset also may be associated with some financial characteristic, and the coupled of the utility and financial characteristics is part of what makes these innovative, and it is the definitions there that I think really need to be more clearly defined in the

United States in particular in order for businesses who want to build on this to be able to innovate and issue new types of digital tokens that can be applied very, very broadly in many, many industries.

Senator CORTEZ MASTO. Thank you. And so, Professor, would you disagree with that? And is your concern more on the financial sector piece of it?

Ms. BARADARAN. Yes, my concern is on the digital asset side. The blockchain is neutral. Technology can be used, like Mr. Allaire said, in voting and all these other things.

I do want to point out, though, that the blockchain has potential to be more secure and reliable. So far it has not been, and it has been hackable. There have been security issues. I think, again, there is a lot of potential, and it has been 10 years and billions of dollars of, you know, venture capital, and I still do not think it is better than some of the payments systems that we currently have, though it could be.

Senator CORTEZ MASTO. OK. So when you talk about—let us go back to the unbanked, because in Nevada we have the highest rate of underbanked adults in our State as opposed to the rest of the country. But can you do me a favor and can you expand on why you think new digital currencies will not meet the banking needs of rural and low-income residents that are not well served by our current banking system?

Ms. BARADARAN. Yeah, I mean, the problems of low-income and underbanked customers is not that they are unsatisfied with the current technology being offered to them. The problem is that they live in banking deserts where there is no place for them to take their cash. Nevada is a huge cash-based economy. Where do you take your cash to put it into a savings account that would then give you are debit card that you can use in e-commerce? There is no place to do that because of a variety of reasons, but mainly because banks no longer are interested in serving those customers.

And so how does any technology, any digital-based currency help when people are operating in cash? Now, do we need to get people off cash? Absolutely. How do we do that? I mean, this blockchain conversation is, you know, four or five steps ahead of where we need to start, which is how do we get ATMs that do not charge $8 per person?

Senator CORTEZ MASTO. I was just going to say, so the answer might be looking at why there is a charge of a fee for an ATM or why you have to have a minimum balance of $1,500 or more in a bank account before you can even open a bank account.

Ms. BARADARAN. Yeah, and this is where I truly am grateful for this industry for bringing attention to these things because, really, there are problems with our payments system. I am not trying to defend them to say that they are perfect and we should use them. There are huge problems, accessibility issues, they are slow, they are inefficient, et cetera. But they have a public mission, and we can fix them, and we should fix them as opposed to sort of outsourcing it to the tech sector.

Senator CORTEZ MASTO. Thank you. I appreciate that.

Chairman CRAPO. Senator Van Hollen.

Senator VAN HOLLEN. All right. Thank you, Mr. Chairman and Ranking Member Brown, and I thank all of you for your testimony. I have been trying to listen from the TV monitors. And I want to thank all of you for your testimony, and I appreciate the series of hearings we have had on the subject of cryptocurrencies and new technologies. But I was listening to you, Ms. Baradaran, talk about the importance of planning for these technologies, but also the need right now to move to a real-time payment system, because our failure to move forward with this technology, as so many other countries have already done, is costing millions of Americans billions of dollars every day, right?

Ms. BARADARAN. Absolutely.

Senator VAN HOLLEN. And, you know, Mr. Chairman, I hate to sound like a broken record on this. Whenever the Fed Chairman or other Members are here, I urge them to move forward right away on building out that faster payment system. I hope that they will make a decision soon.

Let me just, if I could, Mr. Chairman, put in the record an article, and the headline—this is a *Post* article from a little while ago, headline: "A Former Bank CEO Named His Boat 'Overdraft'. Now That Bank Is in Hot Water Over the Fees".

The point is that for people who are living paycheck to paycheck, the inability to access their funds in real time is costing them a huge amount of money in fees and overdraft.

Could you, Professor, just again elaborate on what it is costing the public right now and how we have it within our power right away to move forward on its front?

Ms. BARADARAN. Yes, and if we are worried about the U.S. lagging behind, this is a huge area where we are lagging behind other countries. In the bill that you introduced, real-time processing is essential. So if you do not have a buffer of wealth, if you do not have a big bank account, you need to spend your paycheck as soon as you get it. And this is why people go to check cashers. They would rather pay 10 percent of their paycheck just to be able to use it to pay the rent and buy their groceries. Instead, they go to a bank, they put their paycheck in, and 3 to 5 days later, 3 to 5 business days later, they would have to go back to the bank to be able to get that. That is a main reason a lot of people do not use bank accounts.

And so what does it cost them? Well, not just the check-cashing fees, but the money is sucked out of their accounts, and with these fees, it also makes them rely on payday loans. And they, of course, have got 300 percent APR and just more wealth being sucked out. These are really simple problems, and I think part of being poor is that there are a lot of problems that other people do not realize that you have, and I think we need to have a little bit more compassion about what it is like to not have that much money and how we can make their lives better.

Senator VAN HOLLEN. Well, thank you. As you mentioned, Senator Warren and I and others have introduced legislation to move forward in this area, but really the Fed has it within its power and authority to do this right away. Can you just talk a little bit about how they have that authority or your view that they should move

forward immediately to catch up with many of our global competitors?

Ms. BARADARAN. Yes, they have the authority. They say that they are studying it. I do not know how high on the priority list it is, but I think it should be. You know, as the Brookings Institution pointed out, the low-income people are spending billions of dollars in overdraft fees. We could actually just put that money back in their pockets through adopting this very simple technology. And, yes, I think the Fed should definitely do it.

Senator VAN HOLLEN. I appreciate that.

Mr. Chairman, I would also like to put in the record another article from *FinTech* entitled "Go Slow on Libra. Speed up on Faster Payments".

Chairman CRAPO. Without objection.

Senator VAN HOLLEN. Thank you. It makes the point that some of us have been trying to make, which is that the Fed, again, could do this now and really provide relief and put billions of dollars back into the pockets of working people. And I hope they will move forward quickly. In the meantime, we will continue to push for our legislation.

Thank you.

Chairman CRAPO. Thank you, Senator.

Senator Tester.

Senator TESTER. Thank you, Mr. Chairman. Thank you, Ranking Member Brown. Thank you to the folks who are testifying.

Dr. Nelson, I guess the first question for you is: Do you agree that cryptocurrencies are leaving the U.S.?

Ms. NELSON. Sure. It is certain that other jurisdictions are out ahead of the United States in trying to become cryptocurrency hubs.

Senator TESTER. And so do you think that they are leaving because they are looking for a safe haven to avoid regulation? Or is there another reason?

Ms. NELSON. Some of the cryptocurrency hubs are actually using regulation as a way to attract cryptocurrencies to their borders. It is not a——

Senator TESTER. So increased regulation.

Ms. NELSON. Well, not necessarily increased regulation, but perhaps clarity over regulation, that by giving regulatory certainty to consumers and businesses in the cryptocurrency market, they are getting out in front on that and attracting cryptocurrencies to their jurisdictions.

Senator TESTER. So one of the things that was brought up—and it has been referenced several times in the hearing with Facebook, but one of the things that is of concern, I think, with you and others is how do you prevent bad actors from laundering money that is financing terrorist activities or whatever. Any ideas in that vein?

Ms. NELSON. Money laundering is a huge concern for cryptocurrencies. Countries around the world are looking at their money-laundering regulations and how to address cryptocurrencies. Even the cryptocurrency hubs like Switzerland have money-laundering regulations. They are working to make those more robust. The Financial Action Task Force and international law——

Senator TESTER. Do you believe those regulations could apply to cryptocurrency and have them work?

Ms. NELSON. And have them work? Well, I think money laundering continues to be an issue. The Financial Action Task Force is trying to update its regulations to get in front of the technology. I think it is a continuing concern.

Senator TESTER. So the question is: Is there a way to put a regulatory design in place that will discourage money laundering with cryptocurrencies?

Ms. NELSON. I think some of the licensing and reporting requirements, transparency requirements, can help address some of these concerns.

Senator TESTER. OK. The Facebook fellow who was here talked about—I asked him a question about what happens if the accounts get breached, the same way my credit card has happened on occasion, and it has not cost me any money. The banks have taken care of it, thank God. And I think it may have happened—it happens to everybody at some point in time—through no fault of their own, I might add. So the same thing could be applied here. And his response to that was that they have a one-to-one backup on the dollars.

I do not know if you watched that hearing or not—you did? And any of you can respond to that. That seems to me to be—I mean, that is incredible to have a one-to-one leverage. Do you think that is real?

Ms. NELSON. I think one of the concerns about the libra is how the reserve assets would function. They pledge to have safe assets today, but what is a safe asset today may be less safe tomorrow. So even if it is backed on a one-to-one ratio, will that always be true in a safe asset? And then what happens if there is a run on libra, if it is being used as a global currency, used by billions of people.

Senator TESTER. And you can answer this, too, Professor, if you would like. Go ahead.

Ms. BARADARAN. Yeah, I mean, there is what Facebook sometimes states it is going to do and then what they end up doing, and then, oops, sorry, we were going to do that thing, and we accidentally did not.

Senator TESTER. So would it kill cryptocurrency in the laws that we are probably going to be passing because I do not think we are going to leave it entirely up to the regulators, since they brought it up, if we stipulated that there had to be a one-to-one.

Ms. BARADARAN. Cryptocurrencies, like we said before, there is a variety. I mean, if you are just talking about cryptocurrencies, they actually are trying to be alternative currencies. So they are not worried about one-to-one.

Senator TESTER. OK. Let us talk about the libra specifically, because that—and, look, I am not an expert in this field at all, but it appears to me that they are trying to take the dollar, because you can buy them with the dollar, and then make a transaction across country lines.

In that kind of a scenario, which is what I interpret them to be offering up, would a one-to-one be something that we could require

without putting them out of business? Or would that be good, prudent fiscal responsibility?

Ms. BARADARAN. I think we still are unsure. One-to-one to what? It is not just dollars. It is a basket of currencies. So what is that other one?

Senator TESTER. So in libra's case, one-to-one to every libra, they have got the equivalent dollar amount behind it. I take it what you are saying is there are ways to game the system if they want to game it, regardless of what we say.

Ms. BARADARAN. As we say in law, definitions are tricky. You know, you can define something as a one-to-one, but what does that mean? One-to-one to what, right?

Senator TESTER. Yeah, I got you.

Well, I appreciate you all being here. I would just say that I think this is coming, and we have to be ready for it. And I think that all three of you can be an incredible resource to us as we figure out how we are going to deal with it.

Thank you, Mr. Chairman.

Chairman CRAPO. Thank you, Senator.

I will go to another round of questioning, and I want to start my questions this time with you, Dr. Nelson. In your report, you described the different approaches that different Governments have had to cryptocurrency. What are some of the key attributes of countries whose regulatory frameworks are considered more accommodative? And how do they approach issues relating to money laundering and the other types of issues that we are talking about here?

Ms. NELSON. Some of the countries that are trying to build themselves as cryptocurrency hubs are really trying to adopt clear regulations at the outset on how cryptocurrencies are going to operate. This is to give regulatory certainty to consumers and businesses who want to use cryptocurrency regulations.

That said, some of their regulations have been described as more favorable to cryptocurrency industries. For example, in Switzerland, they have regulations for money laundering addressing cryptocurrency. They have provided guidance on how ICOs should be treated in regards to securities regulations. They provide guidance on what kind of licenses cryptocurrency industries need to operate within Switzerland. So it is not that these countries are trying to shirk regulations. They are trying to provide certainty while also balancing innovation to encourage the adoption of cryptocurrencies.

Chairman CRAPO. So it is not so much that they are trying to create the Wild West, so to speak, and invite folks to come there because there is not really significant regulation. It is that they are providing clarity and—well, maybe, Mr. Allaire, you could address that.

Mr. ALLAIRE. Sure. As we looked at the ongoing expansion in our international business and operations, you know, it was very clear to us that for our non-U.S. business—you know, the U.S. regulations are the U.S. regulations, and what we do here is exactly what the law stipulates. But outside the U.S., you know, there are opportunities for digital assets and blockchains that are larger. And so we spent time to look at all the different jurisdictions, and the

things that we were focused on as a firm were we wanted there to be an actual high bar from a regulatory perspective, meaning that there needed to be, you know, significant, serious firms where fundamental risks were being supervised, enterprise risk, cybersecurity risk, financial crime risk, anti–money-laundering risk, and, most critically in the case of digital assets, custody risk—the protection of these assets from theft, having the appropriate insurance around them—but also clear definitions. And I think this gets to what one of the other panelists has said and I have said as well, which is very clear definitions about what constitutes a token or a digital asset to provide that kind of clarity to businesses that want to operate there; whereas, I think in some other jurisdictions, including the United States, there is an incredible gray area. It makes it very difficult for businesses to know where they stand and where to operate.

So those are some of the things that we considered and have found in other jurisdictions.

Chairman CRAPO. So I want to get into data privacy, and I may have to do that after Senator Brown takes another round. But in the last couple of minutes that I have here, help me understand. If a digital currency is to become global, like Libra seeks to do, how does it do that? How does it get global acceptance if it faces 190 different countries with different jurisdictional issues and different regulatory systems? And maybe another way to ask my question is: If the United States were to decide—and I am not saying that it should, but if the United States were to decide we did not want cryptocurrency to happen in the United States and tried to ban it, I am pretty confident we could not succeed in doing that because this is a global innovation. But how would a company that wants to create a cryptocurrency that has global reach get into the United States? Or how would that impact the United States? Do you see the question I am asking?

Mr. ALLAIRE. I am happy to take part of that, Senator. You know, I think the challenge that we all face with this is, you know, some of these cryptocurrencies, they are literally just a piece of open-source software. There is nothing else. It exists on the internet. It is open-source software. Anyone can implement it. It runs anywhere the internet runs. And these have a monetary policy where these assets are algorithmically generated, and they exist everywhere the internet exists. They will soon exist, you know, interstellar. They will exist, again, anywhere the internet exists.

That is a challenge that every Government in the world now faces, that money, digital money, will move frictionlessly everywhere in the world at the speed of the internet, hopefully with a high level of security and data protection around it.

One of the promises of this technology very specifically is a higher standard around privacy, a higher standard around confidential transactions and data protection. That is one of the core infrastructure focuses of these blockchains, and so I think those needs can be met. There is the flip side, which is how does law enforcement get its job done and how do 190 countries get an agreement about that. You know, FATF guideline, for example, that are specific to virtual assets have come into place, which I think could be a road map to that as well.

Chairman CRAPO. I will have to ask Professor Baradaran and Dr. Nelson to either answer—if I can get to another round, and maybe I will, we can answer that question then.

Senator Brown.

Senator BROWN. Thanks.

Professor Baradaran, I have a series of questions for you. Mr. Allaire said that he did not really know who should regulate digital assets, and Facebook essentially said that 2 weeks ago. Let me ask you a series of mostly yes-and-no questions.

Do we already have rules and regulations for currency?

Ms. BARADARAN. Yes.

Senator BROWN. Do we have rules and regulations for securities?

Ms. BARADARAN. Yes.

Senator BROWN. And do we have rules and regulations for payday loans?

Ms. BARADARAN. Yes.

Senator BROWN. Sort of.

Ms. BARADARAN. Sort of.

Senator BROWN. Do we have rules and regulations for exchange-traded funds?

Ms. BARADARAN. Yes.

Senator BROWN. Are there any new financial products that have been invented that we have never seen before, or are we talking about financial products that already existed but now run on blockchain?

Ms. BARADARAN. Yes, I think—these are my——

Senator BROWN. If you would expand on that.

Ms. BARADARAN. The technology is new, but the sort of essence of the product is something that we have seen before.

Senator BROWN. So if there are not really new products, why would we need new rules and new regulations?

Ms. BARADARAN. I think it is important to have clarity. It is very important for people to understand what it is. I do not think we have to reinvent the wheel on any of this stuff. I think we have clarity in each of the jurisdictions. So the extent a digital asset hits the currency model or the securities model, we have already sort of debated those models, and we can enforce those rules.

Senator BROWN. Are you concerned that tech companies seem to be pretty strongly resistant to rules and regulations?

Ms. BARADARAN. I think there is a lot of faith that some of the problems that we are a society face are solved by tech, and I think sometimes there is a naivete on the part of some of these tech founders in what tech can accomplish and what is better for public institutions. And so I think sometimes tech is great and can solve a lot of problems, use the internet before, and I think nobody wants to ban—no one is saying ban blockchain. No one is saying ban these digital currencies. All we are saying is let us just protect people in the ways that regulations are meant to protect them. So if we had said in the early days of the internet, look, the internet is going to take over education soon, so let us just not worry about fixing public schools and the internet will educate the young, right? So I think it is essentially that. We still have these public institutions that are doing it, and we do not go around them just because we have a new potentially revolutionary technology.

Senator BROWN. Does the resistance of—big tech companies' resistance to regulation, does it remind you of resistance by big banks to regulation? Are there similarities there?

Ms. BARADARAN. There are similarities there, yes.

Senator BROWN. What does that tell you?

Ms. BARADARAN. I mean, I just think we need to be cautious. I think we need to be—again, innovators dream big, and regulators just need to also imagine bad scenarios. I think we as regulators and Congress people do not need to just swallow it wholesale. It is good that we have innovators and entrepreneurs that have really beautiful visions of the future, and I hope that they are right. But it is also good to have a counterpoint to that where regulators say, hey, what could go wrong here and try to imagine those scenarios, too.

Senator BROWN. I have said a number of times in this Committee that many of my colleagues seem to have—maybe we all do to a degree—a collective amnesia about what happened to our financial system 10 years ago. What lessons do we learn from weakening regulations in the banking sector a decade-plus ago? What lessons do we apply to tech companies here?

Ms. BARADARAN. I think one of the things that keeps being said is, you know, we are going to lose—the U.S. is going to lose its, you know, leadership worldwide if we do not let these companies do whatever they want. And I think that is not—we cannot compare the U.S. economic system to Malta or Bermuda or to Venezuela or even China. We have the strongest currency worldwide for a reason. We have great technology companies for a reason. We have got a very, very strong and healthy sector—not to say that it is perfect, just to say that, you know, oh, we are all going to leave to Malta, I do not think that should make regulators think that, OK, well——

Senator BROWN. I know skeptics of your view say that the reason we have such strong innovation is because Government gets out of the way and lets big tech or lets Wall Street invent new products and do what they want.

Ms. BARADARAN. I think we said that until the financial crisis, and then with a $1 trillion bailout, and the Fed is left holding the bag. And so I think we just—you know, we say that on the front end, let them do it, but let us remember what happens when we sort of do not regulate those things that matter. And it is not just all technology. Not all technology is similarly risk-inducing. Again, the internet and email, all of these things, we keep comparing blockchain to these things, but it is very different in a lot of ways, specifically digital assets on the blockchain. We are talking about trading and markets and finance. We are not talking about just neutral tech here.

Senator BROWN. Thanks. Thank you, Mike.

Chairman CRAPO. Thank you, Senator Brown.

I have a few more questions. As I indicated, I would like to get into the data privacy issue a little bit here. As I am sure you know, Senator Brown and I together have jointly expressed serious concerns over the collection of data on individuals and the phenomenal explosive growth of that collection and then use of data. That happens without individuals usually knowing that it is happening or

when it is happening or knowing what has been collected on them or how it is being used.

And each of you could respond to this if you would like to. Will this new technological innovation that we are seeing into digital currencies and blockchain technologies give us an ability to meaningfully enhance individuals' privacy rights and protections? And if so, kind of explain how so?

Mr. ALLAIRE. I would be happy to start. Thank you, Senator. I have addressed this somewhat in my written testimony as well. You know, if you step back for a moment and you look at these public blockchain infrastructures that are being built, they are designed in a way to provide a global, open recordkeeping system that is highly secure, that is very tamper resistant, and which can work in a kind of interoperable way all around the world.

One of the killer apps, if you will, that is being explored to build on top of these—and there are many, many projects, startups, companies, Governments even that are working on this—is the development of essentially new standards for what is often referred to as self-sovereign digital identity, the ability to have a digital identity where you as an individual have self-sovereignty over who can access attributes of your digital identity, how they can access it, the ability to provably demonstrate something to someone, say someone needs to know your age in order to conduct a transaction, without having to disclose to them your address or other information, so the ability to have much more fine-grained, selective ways to attest, through attestation methods, to attest to who you are or what you do without actually having to transmit all of that sensitive personal information.

The data breaches that we have today, the massive privacy violations that happen continually on centralized internet services, those are the core, core issues that blockchain infrastructure is being designed to try and address.

So it is one of the areas I am most hopeful, and when you couple that kind of digital identity model with global digital currencies, you actually can imagine a financial system that both preserves privacy, provides mechanisms that are still highly useful to law enforcement to pursue the bad guys, but, you know, keeps people in control. And so I think those things are, you know, very much becoming possible and in front of us.

There are still needed policies around that, around who can add elements to these digital identities and how they are accessed and reporting and other things. So there is absolutely the need for very clear laws and policies. But it is a technical breakthrough that is emerging that could solve some of these issues.

Chairman CRAPO. So before I go to Dr. Nelson and Professor Baradaran, going beyond financial transactions, could this innovation or technology that you are talking about, could that be used outside financial transactions, for example, somebody surfing on the web or looking to buy a washing machine on the web, and having their identity grabbed or having their search identified and then utilized in artificial intelligence to manipulate them?

Mr. ALLAIRE. It could be applied. It could be applied in putting people in more control over who is accessing their data and how,

when they are interacting with any digital service, not just financial services. It is applicable very broadly.

Chairman CRAPO. All right. Dr. Nelson or Professor, would either of you like to——

Ms. NELSON. I would just add that Facebook has totally changed the debate about privacy and cryptocurrencies. We used to focus on whether cryptocurrencies gave users too much privacy and that it allowed bad actors to engage in nefarious activities. Now with Facebook's libra, the concern is about whether users of cryptocurrencies will have enough privacy and the potential for economic transaction data to be merged with other data about users on the internet, including other Facebook platforms. And this issue then ties into the differences in regulatory approaches taken by countries around the world. Countries regulate privacy differently, and so if you have a global currency with different regulatory approaches relating to privacy, that is maybe something that regulators really want to address and get in front of.

Chairman CRAPO. Thank you. Professor.

Ms. BARADARAN. Yes, I was going to say there are two different kinds of privacy. Do we want to privately buy drugs, child porn, or send money to terrorists? No, and we have laws for that, right? So we do not want that kind of privacy. But we also want the privacy of, you know, Facebook not using algorithms and data to target me knowing, you know, oh, she is sad and does not have enough money in her bank account, so I am going to give her a payday loan when I know that she is going to take it up. That is the kind of privacy where it is not individually—maybe they do not know me personally, but they know the type of person I am and what kind of mistake I would make.

And so those are the kinds of things—they are two very different types of things, and like she said, Facebook presents kind of a different problem than bitcoin, which, you know, is popular for people who want to buy illicit and extralegal drugs. And this is why you see Venezuela, Iran, and other countries with sanctions, you know, wanting to evade them using these platforms.

Chairman CRAPO. Anybody want to add anything else to that?

[No response.]

Chairman CRAPO. Well, there are obviously tons of questions here. I have a lot more myself, and as we move forward, I am sure that we will be communicating with you to get your advice. We appreciate you all coming today and sharing your information and expertise with us. This is obviously a very critical issue. As I said at the outset, I want the United States to stay at the forefront of essentially engaging in and hosting and managing and regulating this new creative technology and the innovation that will flow from it. I do believe that it has some incredible potential that can be utilized for good, and it does have incredible risk that can be utilized for bad. And we just need to get a handle on that. I appreciate your coming here today to help us out on that.

With that, this hearing is adjourned.

[Whereupon, at 11:23 a.m., the hearing was adjourned.]

[Prepared statements, responses to written questions, and additional material supplied for the record follow:]

PREPARED STATEMENT OF CHAIRMAN MIKE CRAPO

Last Congress, this Committee held two hearings examining the digital currency ecosystem.

In those hearings, we heard about some of the developments that have occurred within the digital currency marketplace since the creation of bitcoin in 2008; the potential benefits of digital currencies; and concerns about value stability, fraud and illicit uses, market manipulation, and privacy.

Since then, Facebook announced its intention to launch a blockchain-based payment system and digital currency, libra, that will be governed by an association that will include up to 100 financial and nonfinancial members, including Facebook's digital wallet service, Calibra.

Facebook's Libra project has generated renewed interest in digital currencies and blockchain, generally, including how they interact with U.S. and international regulatory frameworks, the potential benefits and challenges they pose, and concerns around issues like anti–money laundering and counterterrorism efforts, data privacy, consumer protections, commerce and monetary policy.

A few weeks ago, the Head of Calibra, David Marcus, joined the Committee to provide an update on Facebook's proposed digital currency.

During that hearing, Mr. Marcus emphasized some important points and commitments, including that: there are a number of regulators globally that are currently engaged on Facebook's project, including the Federal Reserve, FSOC, FinCEN, Financial Conduct Authority, the G7 and more; Calibra and the Libra Association will have the highest standards when it comes to data privacy, and no financial data or account data that is actually collected in Calibra will be shared with Facebook; and the Libra Association will be headquartered in Geneva, Switzerland, but will still register with FinCEN and have oversight from U.S. regulators.

It seems to me that digital technology innovations are inevitable, could be beneficial, and I believe that the U.S. should lead in developing these innovations and what the rules of the road should be.

The digital currency and blockchain ecosystem is diverse, and care must be taken in determining what gaps may be present in the existing framework and developing a more comprehensive approach.

In mid-July, Treasury Secretary Mnuchin said, "To be clear, the U.S. welcomes responsible innovation, including new technologies that may improve the efficiency of the financial system and expand access to financial services. That being said, with respect to Facebook's Libra and other developments in cryptocurrencies, our overriding goal is to maintain the integrity of our financial system and protect it from abuse."

He also noted that Treasury has serious concerns regarding the growing misuse of digital currencies by money launderers, terrorist financiers, and other bad players.

As Facebook's and other's digital currency efforts move forward, I am particularly interested in better understanding how these technologies may impact individuals' ability to exercise control over their data, including the right to receive information about and access their data, correct inaccuracies, and delete their data.

During this hearing, I look forward to learning more about: the encryption and networking features behind blockchain technology and how that technology enables digital currency transactions; ways that the market for digital currencies has grown and evolved over the last decade; different types of digital currencies in the marketplace, including their key differences with Facebook's proposed digital currency; how other countries are approaching the regulation of digital currencies and blockchain technology, and what we might learn from their successes and failures; potential gaps in existing regulatory frameworks; whether distributive ledger technology can help to facilitate meaningful privacy for individuals' data; and approaches Congress should consider in developing a comprehensive regulatory regime for digital currencies, including ensuring individuals have real control over their data.

With the appropriate balance of regulation, digital currencies and their innovative underlying technology could provide meaningful benefits and I look forward to learning more about the ecosystem during this hearing.

PREPARED STATEMENT OF SENATOR SHERROD BROWN

Thank you Chairman Crapo, and welcome to our witnesses.

At this Committee's hearing earlier this month, many of us of both parties voiced serious concerns about Facebook's plan to run its own currency out of a Swiss bank account.

And by and large, we mostly heard deflections and dodging. It's exactly what we mean when we say Facebook doesn't understand accountability.

Facebook has proven over and over, through scandal after scandal, that it can't be trusted.

But they don't care.

They move fast and break things—things like our political discourse, journalism, relationships, privacy. Now they want to break our currency and payment systems, hiding behind the phrase "innovation."

They want to "innovate" Americans right out of their hard-earned paychecks.

Look around at what happens with big corporations say they want to "innovate."

Before they blew up the economy in 2008, bankers were pitching an "innovative" new product called subprime mortgages.

Just like Facebook—which claims its new currency will help the unbanked and underbanked—these mortgages were supposed to help people who never had access to credit achieve the American dream of home ownership.

In reality, those mortgages ripped off millions of families who ended up losing their homes, they wrecked the economy, and they made the staggering inequality in this country even worse.

The only innovative thing about the financial crisis was how the banks managed to stick everyone else with the bill—not exactly the kind of innovation we were hoping for.

So I am all for innovation—especially if that innovation delivers on its promises of improving people's lives. But big tech companies and Wall Street banks are hiding behind innovation as an excuse to take over important public services that we all benefit from, and should all have a say in.

There are some things—like our currency, our payments system, and the protection of our savings accounts—that everyone in the country has a stake in. We should not be handing those kinds of public resources over to wealthy special interests, so they can squeeze more profits out of ordinary Americans.

Think about how hard it is to get quality service from Comcast, or about how much of your personal data was leaked by Equifax, or how your privacy was invaded by Facebook

So we should be a little suspicious when someone tells us that only big corporations can be trusted to provide critical public services.

I recently moved into a new office—it was John Glenn's office when he served Ohio in the Senate. John Glenn was an innovator—he was the first American to orbit the Earth as part of the Mercury Project, which would be followed by the Gemini and Apollo Missions that would eventually put Americans on the moon. Many of us joined in the celebrations of the 50th anniversary of Apollo 11 just this month.

None of the astronauts did it alone—it took the hard work of thousands of innovating scientists and engineers, people like famed mathematician Katherine Johnson or immigrants like engineer Miguel Hernandez. These Americans didn't do it for the profits. They did it to serve their country, and their successes were shared by every American who saw "U-S-A" emblazoned on the side of Apollo 11.

It's a reminder that some infrastructure works better as a public good, and we shouldn't let Big Banks or Big Tech get their hands on it.

The Federal Reserve and other watchdogs need to continue to be leaders in banking innovation.

And if we don't move quickly to improve important infrastructure—not just roads and bridges, but our payments system—we'll end up with big corporations that have broken our trust over and over doing it—and frankly I don't think that makes any sense.

I look forward to hearing from our witnesses today about which of these technologies might actually help regular Americans, and what we can do to make sure everyone benefits from them.

Thank you, Mr. Chairman.

PREPARED STATEMENT OF JEREMY ALLAIRE

COFOUNDER, CHIEF EXECUTIVE OFFICER, AND CHAIRMAN, CIRCLE INTERNET FINANCIAL LIMITED, ON BEHALF OF THE BLOCKCHAIN ASSOCIATION

JULY 30, 2019

Thank you Chairman Crapo, Ranking Member Brown, and the Members of the Committee. It is my pleasure to appear before you today to testify about the promise of digital assets and blockchain technology and their potential to fundamentally improve and democratize financial services globally—improving access to capital,

eliminating and reducing costs and risks, more effectively fighting financial crime, and ultimately improving opportunities for creating value in our economy.

I have spent the past 25 years helping to build internet technology platforms and companies in the United States, including multiple global, publicly traded technology companies with products and services that have been adopted by millions of businesses and hundreds of millions of consumers. Throughout my career as an internet entrepreneur, I have consistently focused on how the open, global, and decentralized internet could empower people and businesses to better connect, communicate, and transact through innovations in software.

It is these experiences that brought me to the possibilities of cryptocurrencies and blockchain technology, and led me to cofound Circle in 2013. Our vision was that digital currency and related technologies could transform the global financial system in ways that made it much easier for people and businesses everywhere to create and exchange value with the same ease that we create and share information and content on the internet, while eliminating the gatekeepers, toll takers, and middlemen that extract value from the real economy and limit access for all.

Today, Circle is one of the leading cryptocompanies in the world, providing regulated products and services to millions of people who use our products to exchange value, trade, invest, and store digital assets. In the next several years, the adoption of digital currency technologies and blockchains will accelerate, begin to help hundreds of millions if not billions of people, and transform the economies of the countries that participate in the innovation.

Today, I will share my perspective on several things. First, I will discuss the challenges faced by the existing financial system and a vision for what is becoming possible in the next 5 to 10 years because of the innovation of digital assets and blockchains.

Second, I will discuss the fundamental innovation of digital assets and blockchains, including an overview of the different forms that these technologies take and what they can enable for society and the economy. This will include a discussion around "stable value" digital currencies, or stablecoins, which are critical building blocks for the future digital economy.

Third, I will discuss major international and United States-specific policy issues. As one of the earliest cryptocompanies to embrace licensing and regulation virtually everywhere licensing is available, we have well informed views on the gaps, limitations, and opportunities around national cryptopolicy and regulation, and believe this is becoming a major issue. Jobs, investments, and technical innovations are leaving the United States or becoming inaccessible to U.S. citizens and businesses because projects and companies, including Circle, are relocating to other jurisdictions and blocking U.S. persons from even accessing the technology and services.

Finally, I will offer perspective on major issues surrounding identity, privacy, and data security, which I know are important topics for the Committee. Public blockchain technologies have enormous potential for simultaneously increasing our security and privacy while also enabling law enforcement to more effectively execute their mandate for public safety and national security.

Challenges in the Existing Global Financial System and a Vision of the Future

Today's global financial system, including our own domestic financial system, faces significant challenges. Billions of people lack basic access to financial services. Those who do have access face a system with exorbitant fees and excessive time delays—limiting economic opportunity and removing real value from the economy.

Our existing financial system is also riddled with crime and money laundering. According to the U.N. Office of Drugs and Crime, annual illicit proceeds laundered through our financial system exceed $2 trillion, with greater than $300B laundered in the United States alone. Rob Wainwright, the former director of Europol, reports that 99 percent of money laundering goes undetected in the existing banking system. Only detecting 1 percent of financial crimes is clearly not good enough.

Access to capital for small businesses, both here in the United States and globally, is extremely limited with capital markets reserved for only the largest companies. Investment into small and growing private businesses are only accessible to the wealthy and connected, limiting investment opportunities for people everywhere. Venture capital investment remains extremely geographically concentrated. A new, more open and accessible system of capital formation must be possible.

Finally, our existing financial system, built on legacy technology, is riddled with privacy violations and data breaches. Our identities are no longer secure. Banks, credit card companies, and credit reporting agencies have failed to adequately plug the holes in the dike as cybercriminals and hostile Nation States take aim at our

financial infrastructure. According to Juniper Research, the annual cost of data breaches could reach over $2 trillion.

Our existing financial system is in desperate need of transformation. We currently have a global system with limited access and exorbitant fees that impose a tax on real economic activity; a system rife with money launderers and financial crime that is failing 99 percent of the time to stop bad actors and leads to trillions in losses because our existing data and financial infrastructure are not secure enough; a system where entrepreneurs and small businesses don't have access to capital to build and innovate, while Main Street investors are left on the sidelines, blocked from investing in the most promising young companies and technologies.

There is absolutely a better future ahead of us, one that is built on a technological transformation ushered in by digital assets and blockchains.

I am often asked what the world will look like in the next 5 to 10 years, based on the trajectory of this innovative new technology. If policymakers, regulators, and industry can successfully work together, we can transform the financial system to address the deep problems outlined here. With a coordinated effort, in the next 10 years we will see a series of profound changes that will benefit individuals and businesses in the U.S. and around the world:

- Sovereign and nonsovereign global digital currency models will proliferate and become usable by billions of people through their mobile devices. We will become comfortable with the adoption of a mix of private and public monies being available to everyone, everywhere, and will see the rapid development of global basket currencies that become preferred for settlements and storing value.
- Payments and value exchange will be commoditized and become free services on the internet, in the same way that sharing content or data and communicating online are free today. This will ultimately return hundreds of billions of dollars of value to the real economy, as the fees that people and businesses pay to intermediaries to move value drops to zero. This will also lead to greater economic activity between people around the world.
- A new set of internet-based global capital markets built on digital assets will emerge. We imagine capital markets that more closely resemble the multisided internet marketplaces we have in commerce, content, advertising, and transportation. Internet-based markets can support an incredibly diverse and global base of suppliers and buyers, scaling from the individual to the largest enterprise, with incredible choice and access. Our capital markets will resemble the Amazon and Alibaba commerce marketplaces or the Google advertising marketplace more than the NYSE or NASDAQ. This will open up capital formation for businesses globally, while creating new ways for individuals everywhere to save and invest into value-producing enterprises.
- Economic and commercial relationships will increasingly be mediated by smart contracts running on public blockchains, as businesses, labor market participants, and consumers seek to operate in a digital commerce environment with greater security, efficiency, transparency, certainty, and enforceability across borders.
- Decentralized, self-sovereign forms of secure identity and privacy built on public blockchains will become available. These new identity protocols will allow for much safer use of digital services globally, ensure compliance with KYC/AML rules, and radically improve privacy and reduce data leakage while more effectively thwarting financial crimes than our legacy financial system.

All of these things can come to pass within a decade, driving us towards a 21st century architecture for commerce and finance that can deliver greater economic opportunity for all, while enhancing our collective ability to cope with the challenges and risks of the digital age.

Understanding Blockchains and Digital Assets

To understand how we can realize this vision, I would like to give an overview of the fundamental technical innovation of blockchains and a review of the different types of digital assets in the marketplace today, including their use cases and potential for society.

First, in terms of nomenclature, I will be referring primarily to the innovations offered by public blockchains, which are built as freely available, open source software that anyone can connect to and run using an internet-connected device. This differs from private blockchains or permissioned chains, which do not offer the same level of openness, security, privacy, and global reach. Also, the terms cryptoassets, cryptocurrencies, and digital assets are often used interchangeably. I will be using

digital assets as the term to talk about these new, innovative forms of financial assets.

The introduction of bitcoin in 2009 was a momentous occasion, releasing a proverbial genie from the bottle that we will never put back. That genie was the invention of a new form of decentralized, global, and public record-keeping system that is tamper-proof, irreversible, highly secure, and private. This specific blockchain had a relatively narrow focus—to create a new kind of nonsovereign digital money inspired by the implicit monetary policy of gold. The technical breakthrough of bitcoin was not missed by leading technologists, computer scientists, cryptographers, economists, and many others, and has spawned a rapidly growing global ecosystem of competing blockchains, as well as new forms of financial assets built upon these blockchains.

Why are such inventions so important and valuable right now for our country and the broader global community?

The rapid growth of the internet has led to a hyperconnected world, but one where our major institutions—financial, Government, and communications platforms—are built on legacy technology platforms that are centralized and therefore inherently more fragile and at risk of cyberattacks, data breaches, and privacy violations.

Public blockchains, for the first time in human history, are creating new record-keeping and transaction processing systems that are designed to be inherently decentralized, tamper-proof, highly secure, and private. In fact, the most popular blockchains, such as bitcoin and Ethereum, use Nation State attacks as the security threshold that they must defend against. During the past 10 years, they have maintained that level of security, while the rest of the internet has become more porous and vulnerable to hostile Nation States and criminals.

Digital assets and blockchains are also a technical and economic response to what is broadly felt to be a financial system that is rigged against the everyday person, one that is not fully serving the needs of people and businesses to participate in global economic activity, and which places an inordinate burden on the economy through bailouts and excessive fees, while limiting access.

Finally, digital assets are part of a broader societal focus on digital services. People everywhere have felt the benefits of an open internet that connects people, information, and commerce globally. However, expectations have shifted among generations who have grown up with the internet. People already expect that online communication should be instant, global, free, and frictionless. Soon, everyone will have these expectations about money and finance.

Types of Digital Assets and Blockchains

While people and businesses are already using and trading more than 2,300 distinct, publicly available digital assets, I want to broadly talk about three major types of public blockchains and associated digital assets: (i) nonsovereign digital currencies, (ii) blockchain platforms, and (iii) tokenized digital assets. Although the lines and distinctions between these sometimes blur, this categorization is still helpful. I will also provide specific thoughts on a major and important subcategory, stablecoins.

Nonsovereign Digital Currencies

Dozens of distinct blockchains with native digital assets aim to provide a decentralized, private, and secure form of digital money. This digital money is issued algorithmically and secured using an open network of participating computers which are incentivized to honestly verify transactions and shared ledger entries. The most notable and popular of these blockchains is the Bitcoin Network and the associated bitcoin native digital asset.

In addition to bitcoin, there are many other popular blockchains that aim to compete with bitcoin based on improved speed, scalability, security, and privacy features. Some notable examples are Ripple, LiteCoin, ZCash, Bitcoin Cash, Bitcoin SV, Monero, and newer assets such as Grin.

The developers of nearly all of these projects and assets share a common belief in the need for nonsovereign, secure, and private forms of value storage and exchange. The projects also typically create a fixed or highly predictable monetary supply. These attributes make digital assets attractive to those who believe that a predictable supply of money is preferable to fiat currency. Similar to gold and other "commodity monies," these digital assets have grown in popularity in the face of global economic uncertainty, rising nationalism, currency manipulation, and trade war risk.

Given their privacy-preserving characteristics, digital assets pose unique but solvable risks for abuse in financial crimes. Recent FinCEN guidance and the new

FATF guidelines for the AML requirements for "Virtual Asset Service Providers" provide an international roadmap for regulating businesses that act as intermediaries in the transfer of digital assets. However, as I will discuss in more detail later, the proposed global AML rules also create an unintended consequence of privacy risk for people everywhere because they require personal information to be shared, and potentially exposed, between digital intermediaries all around the world.

Blockchain Platforms

Another rapidly growing category of public blockchain and associated digital assets are blockchain platforms. The most well-known and popular blockchain platform is the Ethereum blockchain and its associated digital asset, Ether. Other notable examples include EOS, Tezos, Tron, NEO, Cardano, and Algorand, but there are many more competing in this space. The proposed design of the libra blockchain could also very much be characterized as a blockchain platform.

These blockchains have a broader scope than pure digital currencies. As their name suggests, they seek to provide a platform for building apps and financial assets on top of them. In many respects, these platforms represent one of the most important new infrastructure layers of the internet, providing a means for storing and exchanging data, facilitating transactions, and executing contracts in a decentralized, tamper-proof, and private manner.

These innovations have a collateral benefit: they address the surging privacy and security risks that people, businesses, and society confront in the internet age. Earlier versions of the internet created larger and larger risks for data breaches and privacy violations through the centralization of massive amounts of personal, financial, and other sensitive data in a few large internet services. Blockchain platforms seek to increase internet decentralization and better secure private data.

Most of these platforms are purpose-built; some are focused on the introduction and automation of financial assets and financial contracts, others on more diverse applications in content, games, entertainment, or social media, and still others as general purpose computing platforms aiming to compete with centralized cloud services offered by companies such as Amazon.

The native digital assets of these platforms operate as digital commodities, often referred to as "fuel," which is used to pay for the use of the infrastructure services the platform's provide. Just as oil and gas became the fundamental commodities that powered the industrial economy, these blockchain digital commodities may become the fuel for digital commerce in the 21st century.

We are seeing significant competition and innovation in the development of blockchain platforms, with many of the most innovative projects being designed to accommodate mass market adoption of digital assets and applications. While most current blockchain platforms can support tens of millions of users, we expect to see next-generation platforms that will support applications that can reach hundreds of millions and eventually billions of people. This is likely to happen in the next 2–3 years.

One of the most important functions of these platforms is to provide a means for developers to create custom digital assets, often dubbed "tokens," which are attached to code, called "smart contracts," that enable and enforce features, behaviors or economic incentives associated with the tokens. The ability to create tokenized digital assets is one of the most profound innovations in the modern history of finance, economics, and internet commerce, and a significant category in and of itself in the topology of digital assets.

Tokenized Digital Assets

Of the greater than 2,300 digital assets available to the public, a significant percentage of them are tokens issued on top of popular blockchain platforms such as Ethereum.

Tokens allow businesses and technology projects to create digital assets that can incentivize and provide utility to customers, be sold and used in novel ways to raise capital, and serve as a means of payment. Some examples of tokenized digital assets include:

- New decentralized infrastructure services for storing data and content, sharing files, or streaming and encoding video.
- New identity infrastructure that provides a means for people to control their own data and private identity information.
- Tokens that reward and incentivize content creators, publishers, and end-users of internet content services and games.

- The development of purely digital financial contracts that are implemented in code, including tokenized forms of debt and lending, tokens that provide voting and governance features, and tokens that provide access to underlying royalties or revenue streams.
- Tokens that digitize existing financial contracts such as equities and bonds, enabling more efficient access to capital for business and new investment opportunities for investors globally.
- Tokenization of physical property including real estate, property, and fine art, opening up historically illiquid and inaccessible asset classes for global investors.

The benefit of tokens is that they can be easily stored, transferred, traded, and exchanged, while providing utility to users and benefits to businesses, all within a public infrastructure that is highly secure, tamper-proof, open, and interoperable.

These digital assets often defy easy classification as securities, commodities or currencies. In fact, one of the greatest benefits of digital assets is that they can simultaneously have investment contract, utility, and payment currency characteristics. While this introduces new complexity for financial regulators, it also creates incredible opportunities for businesses and projects that seek to employ digital assets to innovate. Indeed, as I will discuss shortly, this is one of the largest and most important policy and regulatory issues the industry faces.

Stablecoins

A very specific form of tokenized digital asset is the emerging category of stable value tokens, or stablecoins. While the recent announcement of the libra cryptocurrency was the first time many people heard about the concept of a stablecoin, they have been around for years and are growing steadily. Stablecoins represent one of the most important areas of innovation in our global financial system.

There are several flavors of stablecoins. The first are tokens where the stablecoin is backed by a single fiat currency and the backing is held in M1- or M2-style bank deposits. There are other types which are backed by fiat, including the proposed libra digital currency, but which are held in a basket of currencies and potentially other bonds and securities. There are also a number of nonfiat backed stablecoins, such as DAI, which are backed by cryptocurrency collateral with incentives to peg the token to $1.

I will focus today on the fiat currency or asset-backed stablecoin variety, sometimes referred to as fiat tokens. Beyond the attention garnered by libra, fiat tokens are also noteworthy because of the rapid growth in new digital assets such as U.S. Dollar Coin, as well as proposals around the world for central bank-issued or regulated digital currencies.

In their recent history, these fiat tokens have largely been used in the digital asset trading and exchange markets to support trading strategies, including hedging and arbitrage. In the cryptoexchange market, traders need to be able to easily hedge in and out of volatile currency positions, and stablecoins created a tool to achieve this. Stablecoins' advantage over dollars in traditional bank accounts is that they move at the speed of the internet and with the same security and transaction permanence as other digital currencies, helping to reduce or altogether eliminate counterparty risk.

When we founded Circle 6 years ago, we believed that a digital currency based on existing fiat currency would emerge and that new open standards and technologies would allow fiat currency to gain all of the benefits of cryptocurrency. Fiat-backed digital currency would offer speed, security, privacy, global reach and nearly free transmission. Moreover, we were confident this kind of digital fiat money would become programmable using smart contracts, creating the possibility of a broad transformation of the global financial system.

Just over 2 years ago, technology emerged to make these new standards possible, and we embarked on the creation of the CENTRE Consortium and its first stablecoin, the U.S. Dollar Coin (USDC).

The CENTRE Consortium is a new membership-based network that provides an open source and open standard protocol for using fiat currencies on blockchains. CENTRE's self-governance scheme requires consortium members to ensure compliance with financial regulations and the demanding security, custody, audit, and accounting methods needed to operate such an enterprise. CENTRE was cofounded by industry leaders Circle and Coinbase and recently opened up for new member applications. Conceptually, CENTRE is a mix between an open source software project and a self-governed payment network such as Visa or Mastercard.

The first stablecoin issued on the CENTRE Network is the U.S. Dollar Coin, a digital currency that is 1:1 dollar backed with reserves held in high-quality U.S. banks, with public monthly reserve attestations provided by a leading global public accounting firm. Issuers, which today include Circle and Coinbase, are regulated money service businesses under FinCEN rules and are licensed and regulated under money transmission and State banking statues around the United States.

Over $1 billion has been tokenized, and over $500 million redeemed, through our services. U.S. Dollar Coin is now the largest and fastest growing financially transparent stablecoin issued by regulated financial institutions.

How Does CENTRE and U.S. Dollar Coin Compare to Libra?

USDC has been available to customers since Q4 of 2018. We published our white paper nearly 2 years ago, launched the protocol and associated services, and recently opened up the consortium to new members. USDC is already supported by dozens of digital wallets, exchanges, and custodial services, and is being used daily by leading digital asset market makers and liquidity providers.

While USDC was initially launched with a focus on trading and markets use-cases, similar to libra, it has been designed to expand into payments and settlement for both consumers and businesses. Because it is built on the most popular smart contract platform, Ethereum, we also expect USDC to be used for financial contracts and other tokenized digital assets.

Unlike Libra, which is attempting to establish a new global currency and unit of account, the CENTRE protocols provide a path for major reserve currencies to work as digital currencies. Over the next several years, the most important payments and financial contracts use-cases that use digital currency will be denominated in popular global reserve currencies.

Also, unlike Libra, which has tied its stable-value token to its own blockchain, CENTRE is becoming blockchain agnostic, as we are moving to enable the CENTRE protocols and stablecoins to work on all major public blockchain infrastructures. Major public blockchain platforms are still in the early stages of development and adoption. Moving forward, people and businesses will want to use fiat digital currencies across these different platforms, in the same way that we want our content and websites to be accessible by any operating system, web browser, or device. We believe in openness, interoperability, and cross-platform standards.

The Regulatory Environment for Digital Assets

I am both deeply familiar with and actively involved in regulatory and policy issues surrounding cryptocurrencies, digital assets, and blockchain technology. Circle itself has embraced a regulated approach to crypto, with money transmission licenses from 48 States, the first New York BitLicense, the first Electronic Money Issuer (EMI) license for a cryptocompany in the U.K. and EU, and one of the first FINRA-regulated broker dealers operated by a cryptocompany. We have devoted significant time over the past 6 years to engaging constructively with financial regulators and policymakers all around the world.

It is incorrect to think that U.S. cryptocompanies are unregulated. We focus every day on our obligations under Federal and State law, as well as the supervisory agreements of the licenses we carry. But being a law-abiding U.S. citizen should not put U.S. companies, or U.S. industry, at a disadvantage in the development of this global technology. To harness its promise, the industry needs consistent and globally coordinated national policies on digital assets. Because digital assets present a new kind of custody and security risk, the appropriate response of Governments should be to ensure that there is supervision and compliance around the fundamental protections needed for financial services—enterprise risk, cybersecurity risk, fraud and financial crime risk, and the risk of theft.

At the same time, there is a tremendous amount of technical and business model innovation emerging in this field, with new developments moving at an accelerated pace. To support this innovation and experimentation, it is crucial that Governments approach this new asset class with a relatively light touch.

A number of Governments around the world have started to pass laws that take just this approach, including smaller jurisdictions such as Singapore, Bermuda, Switzerland, and Malta. Recently, larger countries such as France and Japan have put forward and are contemplating cohesive national policy frameworks for the digital asset industry.

Governments and regulators globally are taking very different approaches, creating a significant impact on the industry. In the United States, regulatory uncertainty and the application of laws that do not contemplate digital assets has led to the loss of significant opportunity for U.S. cryptocompanies, and ultimately for consumers, businesses, and the national economy as a whole. The Securities and Ex-

change Commission, for example, is forced to apply Federal laws written in the 20th century to technologies created in the 21st. In the U.S., one of the main factors that determines whether or not a cryptoasset should be regulated as a security is the Howey test, formulated by the Supreme Court in 1946.[1] If an asset is deemed a security, it must be registered with the SEC and the team behind it must abide by a wide range of regulatory obligations. The consequences of a mistake can be serious financial and legal consequences for an organization as well as its officers and employees. This has had a material impact on the competitiveness of U.S. cryptocompanies, and is a backward- rather than forward-looking approach. Congress should consider new laws that protect consumers while not causing companies to fixate on nearly century-old definitions rather than innovation. While the U.S. has been working through these issues, foreign, mostly Asian-based, cryptocompanies have begun to dominate, while U.S. companies have lost considerable market share.

The result of the uncertain and restrictive regulatory environment has led many digital asset projects and companies to domicile outside of the United States and to block U.S. persons and businesses from accessing products and technologies. In Circle's case, we have begun the process of moving our international-facing products and services into a licensed Bermuda entity. Bermuda's forward looking Digital Asset Business Act provides a comprehensive regulatory framework for companies offering this new type of financial service. We believe that the approach the Bermuda Government has taken can and should be emulated by other countries. Some of the positive aspects of their regulatory framework include:

- They have established a comprehensive national policy for digital assets businesses.
- Rather than try and fit digital assets into banking and payments or securities and investments laws, they established a new set of laws specific to digital assets, including a new set of definitions of what constitutes digital assets, reflecting the dynamic and multifaceted nature of this new asset class.
- The licensing and supervisory framework is broad, spanning digital asset activities including storage and custody, payments, dealing and trading, and operating exchanges.
- Compared to a patchwork of regulators here in the United States, across the Federal Government and the States, there is a single regulator to supervise firms.
- There is an acknowledgement from both policymakers and regulators that this is a dynamic and fast moving field with constant technology and business model innovation, and they have committed to proactively working with industry to evolve the laws and supervisory requirements as the market grows and matures.
- The core of the risks they are focused on regulating are in our view the most important risks—enterprise risk, financial crimes risk, cybersecurity risk, and custody risk.

As the largest economy in the world, and the home of the largest financial markets infrastructure, the United States has built robust regulatory and supervisory frameworks for financial institutions that have served as a model for other countries. This is a huge asset for the U.S. and the global economy, and the legal frameworks that have been adopted and amended over the past 80 years are without a doubt foundational to market stability and risk management.

However, just as the joint-stock corporation and private banking emerged and transformed how economic activity could be organized during the late industrial revolution, the development of the global digital economy and a new financial system built on digital assets will lead to massive changes in the nature of finance and economic organization.

It is vital that we allow innovators and digital assets projects room to grow and develop here in the United States. Congress should adopt national policies that define and establish digital assets as a new asset class and develop appropriate rules and exemptions for digital assets. This will require legislation that likely changes our existing commodities, securities, and banking laws, among others. Such policies should have the effect of enabling rapid technological progress within the context of sound risk management.

Without a sound, pragmatic, and agile national policy framework for digital assets, I am concerned that the United States will not be the world's leader in this

[1] Securities and Exchange Comm'n v. W.J. Howey Co. , 328 U.S. 293 (1946).

critical new technology, that it will continue to fall behind, and that it will not fully reap the benefits of the economic transformation that digital assets will bring.

Thank you for your increased interest and attention to this area of significant transformation. I look forward to continued dialogue as we work to ensure that the United States remains a center of technological advancement of the financial system.

PREPARED STATEMENT OF REBECCA M. NELSON

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JULY 30, 2019

Chairman Crapo, Ranking Member Brown, and Members of the Committee, thank you for the opportunity to appear before you today on behalf of the Congressional Research Service to discuss "Examining Regulatory Frameworks for Digital Currencies and Blockchain".

As requested, my testimony focuses on the international landscape of digital currencies and emerging policy issues.[1] In particular, I discuss the cryptocurrency market, the approaches adopted by Governments to regulate cryptocurrency, and the potential need for harmonization of regulations across countries. I also analyze the potential implications of proposals made by some Governments and large multinational corporations (MNCs) to create new digital currencies to be used on a large scale.

Cryptocurrencies: Terminology and Market Developments

Cryptocurrencies are digital representations of value that typically are administered using distributed ledger technology and have no status as legal tender. Distributed ledgers use independent computers to record, share, and synchronize transactions in their respective electronic ledgers, rather than relying on a centralized ledger.[2] As a result, cryptocurrencies do not rely on Government agencies (such as central banks) or financial institutions (such as private banks), both of which are involved in the creation and transfer of fiat money (money that has no intrinsic value, but serves as money by Government decree). Most cryptocurrencies usually use a particular type of distributed ledger technology, blockchain, to both secure the ledger using cryptographic protocols and give users some level of anonymity.

The first cryptocurrency, bitcoin, was launched in 2009, partly in response to concerns about traditional banks and fiat money following the global financial crisis of 2008—2009.[3] Over the following decade, thousands more cryptocurrencies were created. As of today, more than 2,200 cryptocurrencies are in circulation.[4] As the market has developed, different types of cryptocurrencies have emerged that vary on a number of dimensions.[5]

Types of Cryptocurrencies and Related Terminology

Payment tokens are the most well-known type of cryptocurrencies, and are designed to function as a medium of exchange or payment for goods and services. Bitcoin is a payment token, as are Ethereum and Litecoin among others.[6] Utility tokens are digital assets designed to be spent within a certain blockchain system. For example, the Golem platform is a marketplace for computing power; users can earn Golem Network Tokens by renting out unused computational resources.[7] Another example is Dentacoins: dental patients can earn the coins by giving dentist

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[1] This testimony draws on CRS Report R45440, "International Approaches to Digital Currencies", by Rebecca M. Nelson. Relevant CRS products also include CRS Report R45427, "Cryptocurrency: The Economics of Money and Selected Policy Issues", by David W. Perkins; CRS Report R45116, "Blockchain: Background and Policy Issues", by Chris Jaikaran; CRS In Focus IF10825, "Digital Currencies: Sanctions Evasion Risks", by Rebecca M. Nelson and Liana W. Rosen; CRS Report R45301, "Securities Regulation and Initial Coin Offerings: A Legal Primer", by Jay B. Sykes; and CRS In Focus IF10810, "Blockchain and International Trade", by Rachel F. Fefer.

[2] "Blockchain and Distributed Ledger Technology (DLT)", World Bank Brief, April 12, 2018.

[3] "An Abridged History of Bitcoin", *New York Times*, November 19, 2013.

[4] "Cryptocurrency Market Capitalizations" *CoinMarketCap*, with values as accessed on July 19, 2019. Market capitalization data is not available for about 400 cryptocurrencies.

[5] Rebecca Campbell, "The Ultimate Cryptocurrency Explainer: Bitcoin, Utility Tokens, and Stablecoins", Next Web, February 13, 2019.

[6] "Payment Tokens", *Medium*, November 14, 2018.

[7] Maaren Zuidhoorn, "The Technology Behind Ethereum Tokens", *Medium*, May 9, 2019.

reviews and other activities and use Dentacoins to pay for dental services at participating dentists.[8]

More recently, a new type of cryptocurrency has been created to address the large value fluctuations of the more prominent payment tokens.[9] "Stablecoins" are cryptocurrencies pegged to or backed by fiat currencies, other cryptocurrencies, or precious metals. As their name indicates, these cryptocurrencies are designed to be more stable in value than the earlier payment tokens. Tether and Gemini Dollar, which were designed to be backed by the dollar on a 1:1 ratio, are examples of stablecoins, as are Digix Gold Tokens, which were designed to be backed by gold.[10] Facebook's proposed new cryptocurrency, the libra, would also be a stablecoin; Facebook is planning to back the libra with a basket of "low-volatility" assets (bank deposits and short-term Government securities) from "stable and reputable central banks."[11]

Cryptocurrencies are also occasionally referred to as cryptoassets, to emphasize that these products are in practice closer to financial assets or investments than a functional medium of exchange.[12] The term "cryptoassets" is also used to refer more broadly to the expanding universe of financial products underpinned by distributed ledger technology. In addition to digital money, entrepreneurs are increasingly exploring the distributed ledger technology's application to securities. Security tokens are a subset of cryptoassets and are used to represent legal ownership of a financial asset, such as equity or debt interests in an enterprise managed principally by others and are often transacted using distributed ledger technology.[13] One example of a security token is tZero, a subsidiary of e-commerce retailer Overstock. The tZero security token provides its holders with a preferred equity security in Overstock, and features a dividend based on the firm's revenue.[14]

Companies that facilitate the use of cryptocurrencies have also flourished over the past decade. For example, exchanges are digital platforms that allow customers to trade cryptocurrencies for other cryptocurrencies and/or fiat currencies. Top exchanges by trading volume are OKEx, Binance, and HitBTC.[15] Wallets are applications or interfaces that can be downloaded onto a device to facilitate transacting in cryptocurrencies. Popular wallet apps include Exodus and Copay, among others.[16]

Market Trends

The cryptocurrency market is concentrated and volatile. In terms of market concentration, bitcoin remains the most well-known and widely used cryptocurrency, accounting for 65 percent of the market.[17] The five largest cryptocurrencies (Bitcoin, Ethereum, Ripple, Litecoin, and Bitcoin Cash) account for over 80 percent of the market (Figure 1). In terms of market fluctuations, the cryptocurrency market (driven largely by bitcoin) boomed in 2017, increasing from a market value of about $18 billion in January 2017 to over $800 billion in January 2018. The market crashed in 2018, with cryptocurrencies losing about 85 percent of their value by the end of the year. It has somewhat rebounded in 2019, to about $274 billion in July, comparable in market value to large corporations such as Nestle, Samsung, or Proctor and Gamble.[18] Compared to other global financial markets, however, the

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[8] Izabella Kaminska, "From Max to Minimum Optimality With Dentacoin", *Financial Times*, August 4, 2017.

[9] Tatiana Koffman, "Stablecoins: The Next Generation of Digital Money", *Forbes*, March 8, 2018.

[10] Hannah Murphy, "Stablecoins Are Crypto Sector's Next Big Bet", *Financial Times*, November 15, 2018; Frances Coppola, "Tether's U.S. Dollar Peg Is No Longer Credible", *Forbes*, May 14, 2019.

[11] Even though libra is a "stablecoin," its value would fluctuate against the dollar as currencies in the basket fluctuate. "The Libra Currency and Reserve", White paper, June 2018.

[12] For example, see Hyun Song Shin, "Cryptocurrencies and the Economics of Money", Bank for International Settlements, June 24, 2018.

[13] Olga Kharif, "Security Tokens Are the New Crypto—But You Probably Can't Afford Them", *Washington Post*, February 11, 2019.

[14] Rebecca Campbell, "The Ultimate Cryptocurrency Explainer: Bitcoin, Utility Tokens, and Stablecoins", Next Web, February 13, 2019.

[15] "Top 100 Cryptocurrency Exchanges by Trade Volume", *CoinMarketCap*, with values as accessed on July 23 2019.

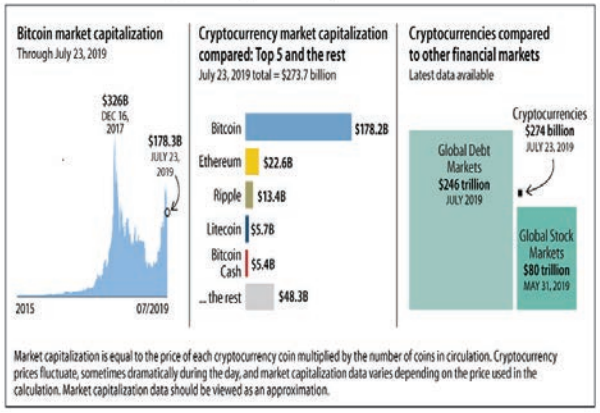
[16] Oliver Rist, "The Best Cryptocurrency Wallets From 2019", *PC Magazine*, September 18, 2018.

[17] Data on cryptocurrency market valuations in this written statement are from "Cryptocurrency Market Capitalizations", *CoinMarketCap*, with values as accessed on July 23, 2019.

[18] IMF, World Economic Outlook, April 2019; "The World's Largest Public Companies", *Forbes*, accessed July 25, 2019.

cryptocurrency market is small: global stock markets are valued around $80 trillion and global bond markets are valued around $246 trillion globally.[19]

Figure 1. Cryptocurrency Market Trends



Source: CRS analysis of data from CoinMarketCap (www.coinmarketcap.com), Global Financial Data, Inc., and Institute of International Finance, "Global Debt Monitor – July 2019."

Potential Benefits and Risks

In general, observers debate whether cryptocurrencies will in time achieve their purported potential, or whether they are another speculative bubble, similar to tulip bulbs in 17th century Holland.[20] Proponents argue that cryptocurrencies have the potential to revolutionize the financial and banking industries. Cryptocurrencies could increase payment efficiency, reduce transaction costs of payments and fund transfers, increase participation in the financial system, and facilitate transactions.

Others are more skeptical. Many cryptocurrencies are considered to be volatile, create a host of consumer protection and illicit finance concerns, face an uneven global regulatory environment, and require sizeable energy resources for the associated computations. Some skeptics allege that many cryptocurrencies are effectively a Ponzi scheme and primarily finance illicit activities.[21]

Patchwork of National Regulations

Cryptocurrencies span national borders and are designed for international use, but they are regulated by Governments at the national level. Governments around the world are taking different approaches to cryptocurrencies, applying different nomenclatures and definitions, and tackling different legal and policy questions. With more than 190 sovereign States in the world and arguably little harmonization of cryptocurrency regulations across countries to date, a complex patchwork of Government regulations is emerging. Broadly speaking, Government approaches fall across a spectrum from actively encouraging cryptocurrencies to banning them outright.

Actively Fostering Cryptocurrencies

At one end of the spectrum, some Governments are actively seeking to become cryptocurrency hubs by attracting and developing cryptocurrency industries in their countries. These Governments view cryptocurrency as an important financial innovation that can create jobs and generate economic activity. They have created regulatory frameworks tailored to, and designed to attract, a range of businesses and activities in the cryptocurrency industry, including cryptocurrency exchanges and initial coin offerings (ICOs).

For example, Switzerland is seeking to create a cryptocurrency industry, or "Crypto Valley," a cluster of companies associated with cryptocurrency akin to the

[19] Global Financial Data, Inc. and Institute of International Finance, "Global Debt Monitor—July 2019".

[20] Nathaniel Popper, "After the Bust, Are Bitcoins More Like Tulip Mania or the Internet?" *New York Times*, April 23, 2019.

[21] For example, see Paul Krugman, "Bitcoin Is Basically a Ponzi Scheme", *Seattle Times*, January 30, 2018; Nouriel Roubini, "The Great Crypto Heist", *Project Syndicate*, July 16, 2019.

cluster of technology companies in Silicon Valley. "Crypto Valley" is located in the canton of Zug. The jurisdiction has tried to attract cryptocurrency companies and exchanges through the early adoption of regulations designed to provide regulatory certainty; these regulations are also generally viewed as favorable to attracting cryptocurrency activities. Multinationals are attracted to Zug's low tax rates. Companies that created and promote Ethereum, the second largest cryptocurrency by value, are located in Zug, and as many as 200–300 cryptocurrency entities have opened there in recent years.[22] The nonprofit that is to oversee Facebook's proposed new cryptocurrency, the libra, is registered in Geneva, where it received a "warm welcome" from officials.[23] By contrast, officials in many other jurisdictions have raised a number of concerns regarding the libra. In 2018, the Swiss finance minister talked about expanding "Crypto Valley" to "Crypto Nation."[24]

Similarly, Malta is promoting itself as "Blockchain Island." Its development of "cryptofriendly" frameworks and a blockchain strategy taskforce to advise the Government, as well as a favorable tax rate for international companies, has attracted cryptocurrency industries, including two prominent cryptoexchanges (Binance and OKEx).[25] Singapore has also strived to become a cryptocurrency hub in Asia, with analysts describing its regulators as well-informed and transparent about blockchain and cryptocurrency, compared to regulatory uncertainties in other jurisdictions.[26] Singapore has embraced cryptofriendly regulations and is a major location for ICOs.[27] Singapore has also explored ways to integrate distributed ledger technology into its financial system.[28]

Banning or Restricting Cryptocurrencies

At the other end of the spectrum, Governments have banned the use of cryptocurrencies or specific activities associated with cryptocurrencies. These Governments generally view the risks of cryptocurrencies, such as undermining financial stability, lack of investor and consumer protections, and the potential for illicit transactions, as more significant than the possible benefits.

For example, China has restricted its banks from using cryptocurrencies as currency, banned ICOs, and restricted cryptocurrency exchanges.[29] South Korea has also banned ICOs.[30] Algeria, Bolivia, Morocco, Nepal, Pakistan, and Vietnam ban all cryptocurrency activities; Qatar and Bahrain bar domestic cryptocurrency activities; and Bangladesh, Colombia, Iran, Lithuania, Lesotho, and Thailand ban financial institutions from facilitating transactions involving cryptocurrencies.[31] Egypt has banned the use of cryptocurrencies to conduct commerce, Taiwan has prohibited its banks from accepting or transacting cryptocurrencies, Indonesia has prohibited the use of cryptocurrencies for payment, and Vietnam does not allow cryptocurrencies to be used as a legal means of payment.[32] In India, a Government panel has recommended banning cryptocurrencies.[33]

Balanced Regulation of Cryptocurrencies

In the middle of the spectrum, some Governments are seeking to balance encouraging financial innovation and managing the risks posed by cryptocurrencies, while providing greater clarity surrounding the emergency of cryptocurrencies. These Governments stop short of banning cryptocurrencies but are not actively seeking to become cryptocurrency hubs. Most major advanced economies, including the United

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[22] Anna Irrera and Brenna Hughes Neghaisi, "Switzerland Seeks To Regain Cryptocurrency Crown", Reuters, July 19, 2018.

[23] Hugo Miller and Leonard Kehnscherper, "Facebook's Cryptocurrecy Gets a Warm Welcome in Geneva", Bloomberg , June 25, 2019.

[24] Matthew Allen, "Swiss Blockchain Industry Sees Meteoric Growth", SWI, October 10, 2018.

[25] For example, see Viren Vaghela and Andrea Tan, "How Malta Became a Hub of the Cryptocurrency World", *Bloomberg Businessweek*, April 23, 2018; "Regulation of Cryptocurrency Around the World", Global Legal Research Center, Law Library of Congress, June 2018

[26] Joyce Yang, "Singapore Is the Crypto Sandbox That Asia Needs", *TechCrunch*, September 22, 2018.

[27] "Singapore Continues To Be a Hotbed for Crypto Companies in 2019", *Asean Today*, July 29, 2018.

[28] Ibid.

[29] Gerry Mullany, "China Restricts Banks' Use of Bitcoin", *New York Times*, December 5, 2013; Chao Deng, "China Bans Fundraising Via Cryptocurrencies, Known as ICOs", *Wall Street Journal*, September 4, 2017; Kenneth Rapoza, "Cryptocurrency Exchanges Officially Dead in China", *Forbes*, November 2, 2017.

[30] Oscar Williams-Grut, "South Korea Banks ICOs", *Business Insider*, September 29, 2017.

[31] "Regulation of Cryptocurrency Around the World", Global Legal Research Center, Law Library of Congress, June 2018.

[32] Ibid.

[33] Rahul Shrivastava, "Govt Committee Recommends Ban on Cryptocurrency in India", *India Today*, July 23, 2019.

States, Eurozone countries, and the United Kingdom, have adopted this type of approach.

Regulatory frameworks in many countries are still evolving, and countries are taking different approaches. Countries often have differing working or legal definitions of cryptocurrencies and are developing differing regulations across a range of issues. Some countries are applying or adapting existing regulations to cryptocurrencies and others are developing new regulations specifically focused on cryptocurrencies. One study finds that even within countries, consensus may be elusive, as different agencies in the same Government may adopt conflicting approaches to cryptocurrencies.[34]

Countries have focused, to varying degrees, on regulations pertaining to cryptocurrencies' permitted usage, tax treatment, application to securities regulations, anti–money laundering/countering the financing of terrorism (AML/CFT) implications, registration and reporting requirements, cybersecurity requirements, and regulations pertaining to financial institutions dealing with cryptocurrencies.

For example, regulators focus on cryptocurrency exchanges, because they provide a nexus between the cryptocurrency market and the traditional financial sector. Exchanges present a number of issues for regulators, particularly related to consumer protections and money laundering. According to one study, nearly 95 percent of all reported trading in bitcoin is suspected to be artificially created by unregulated exchanges.[35] There are also concerns that exchanges are exploited for money laundering.[36] Regulators striving to protect consumers and address illicit financing consider what licensing, reporting, cybersecurity, systems integrity, and AML/CFT regulations to apply to exchanges, among other requirements.[37] Part of their calculation may center on whether to apply existing regulations, such as those pertaining to banks, securities exchanges, or other components of the payments or financial system, or whether to develop a new regulatory structure altogether. The different types of cryptocurrencies (for example, payment tokens vs. stablecoins) and the opaque nature of the exchanges may complicate regulators' calculations.[38] Different countries have taken various approaches in their licensing, transparency, and AML/CFT requirements.

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[34] Claire Groden, Edorado Saravalle, and Julia Solomon-Strauss, "Uncharted Waters: A Primer on Virtual Currency Regulation Around the World", Center for a New American Security and The Center on Law and Security at the NYU School of Law, September 2018.

[35] Paul Vigna, "Most Bitcoin Trading Faked by Unregulated Exchanges, Study Finds", *Wall Street Journal*, March 22, 2019.

[36] Nouriel Roubini, "The Great Crypto Heist", *Project Syndicate*, July 16, 2019.

[37] Daniel A. Leslie, "Cryptocurrency Exchanges and Custody Providers: International Regulatory Development", Norton Rose Fulbright, October 2018.

[38] Leslie Ankney, "Who Should You Trust? Understanding Crypto Exchanges and Regulation", *Forbes*, January 30, 2019.

Cryptocurrency Exchange Regulations: Selected Examples[39]

- **Australia**: The government requires exchanges to register with the nation's anti-money laundering (AML) agency and implement anti-money laundering and countering the financing of terrorism (AML/CFT) programs.
- **Estonia**: The Supreme Court upheld the Estonian government's application of AML laws to cryptocurrency exchanges. These laws require exchanges that conduct trades over €1,000 (about $1,200) to meet their customers in person and keep identification records.
- **Japan**: Exchanges must be registered with the Financial Services Agency, obey minimum capital and cybersecurity requirements, and undergo audits, among other stipulations.
- **Jersey** (the Channel Islands): Exchanges above £150,000 (about $195,000) are required to register with the Jersey Financial Services Commission and comply with AML and CFT regulations.
- **European Union (EU)**: The European Parliament adopted a directive that extends AML/CFT regulations to currency exchanges.
- **Luxembourg**: The government requires all exchanges be licensed by the Finance Ministry.
- **Philippines**: Exchanges are required to apply for a certificate of registration, register with AML authorities, and are subject to fees.
- **United States**: The Securities and Exchange Commission (SEC) requires registration of any trading platform that meet its definition of a national securities exchange. The Treasury Department's Financial Crimes Enforcement Network (FinCEN) requires cryptocurrency exchanges to register as money services businesses (MSBs) and implement relevant AML recordkeeping, reporting, and compliance measures. Cryptocurrency exchanges are also subject to state regulations.
- **UK**: Government applies its AML regulations to cryptocurrency exchanges.

Governments also vary in their regulatory treatment of ICOs. ICOs are a process by which new cryptocurrency coins or tokens are issued, and a way to raise capital. In 2018, 2,284 ICOs were concluded, raising almost $11.4 billion.[40] Consumer protections are a key concern of ICO regulations: according to one study, nearly 80 percent of ICOs in 2017 were identified as scams, and only about 8 percent reached the trading stage on cryptocurrency exchanges.[41] Regulators have focused on when ICOs should be regulated as securities. The issuance of securities is highly regulated in many countries. For example, countries may require registration with a regulating agency and the disclosure of information about the seller and the security. Some countries have developed guidance on the application of securities regulations to ICOs based on different types of tokens; others are applying existing securities regulations to ICOs on a case-by-case basis.

[39] Claire Groden, Edorado Saravalle, and Julia Solomon-Strauss, "Uncharted Waters: A Primer on Virtual Currency Regulation Around the World", Center for a New American Security and The Center on Law and Security at the NYU School of Law, September 2018.

[40] Daniele Pozzi, "ICO Market 2018 vs 2017: Trends, Capitalization, Localization, Industries, Success Rate", *Coin Telegraph*, January 5, 2019.

[41] Sherwin Dowlat, "Cryptoasset Market Coverage Initiation: Network Creation", Stais Group, July 11, 2018.

Initial Coin Offerings (ICO) Regulations: Selected Examples[42]

- **Canada**: Canadian Securities Administrators released a notice clarifying that many cryptocurrency offerings involve the sales of securities, although it has approved exemptions for some ICOs from securities requirements.
- **France**: The government is considering an ICO licensing regime that would regulate ICO token sales.
- **Hong Kong**: The Securities and Futures Commission released a statement that virtual tokens may be subject to securities laws, depending on the facts and circumstances of an ICO.
- **Switzerland:** The Swiss financial supervisory authority has published guidance on the application of securities regulations by token type, although will review ICOs on a case-by-case basis.
- **United Arab Emirates:** ICOs are regulated as securities offerings on a case-by-case basis.
- **United States:** The SEC may regulate virtual coins or tokens offered as part of an ICO as securities, depending on the specifics of the ICO. ICOs in the United States are also subject to state-level regulations.

National regulators have also considered the tax treatment of cryptocurrencies, and again have arrived at different approaches. For tax purposes, a cryptocurrency could be considered a form of cash, foreign currency, investment, income, commodity, or service. Classification has implications for the tax treatment of transactions and holdings of cryptocurrencies. For example, classification may determine whether cryptocurrency proceeds are subject to income tax, capital gains tax, sales tax, and so forth. Some jurisdictions also differentiate between individual use of cryptocurrency on a small scale and larger-scale cryptocurrency investments and transactions. Likewise, some jurisdictions differentiate between cryptocurrency transactions by corporations and individuals. Another complicating factor is the growing types of cryptocurrencies. As cryptocurrencies proliferate and start to serve different functions, policymakers are faced with whether they should all be taxed the same way.

[42] Claire Groden, Edorado Saravalle, and Julia Solomon-Strauss, "Uncharted Waters: A Primer on Virtual Currency Regulation Around the World", Center for a New American Security and The Center on Law and Security at the NYU School of Law, September 2018.

Tax Treatment of Cryptocurrencies: Selected Examples[43]

- **Many EU countries** exempt cryptocurrency transactions from value-added tax (VAT).
- **Canada**: Cryptocurrencies are considered commodities and profits from transactions in cryptocurrencies are taxed as a barter transaction, which is subject to income tax.
- **France**: The government updated its tax rules to make cryptocurrencies subject to capital gains tax.
- **Germany**: The government does not tax cryptocurrencies when they are used for payments.
- **Israel**: The government clarified that virtual currency sales would be subject to a capital gains tax and miners and other traders would be subject to a VAT.
- **Poland**: Taxpayers have been advised to file taxes on cryptocurrency trading and profits.
- **Singapore**: Companies that buy and sell cryptocurrencies must pay taxes based on gains from their sale, but gains from long-term investments are considered capital and therefore not taxed (since Singapore does not have a capital gains tax).
- **Sweden**: Cryptocurrencies are not subject to the VAT but may be taxed as capital gains. The application of income vs. economic activity tax depends on the transactions per year.
- **United States:** The Internal Revenue Service found that cryptocurrencies are considered property, not currency, for tax purposes.

Despite the differences in regulatory approaches, one global survey of cryptocurrency regulations finds that issuing warnings about the pitfalls of investing in cryptocurrencies is exceedingly common.[44] Such warnings are usually issued by central banks, and are largely designed to educate citizens about the difference between fiat currencies and cryptocurrencies. The warnings caution that citizens who invest in cryptocurrencies do so at their own personal risk and that consumers have no legal recourse available in the event of loss.

The Need for International Regulatory Harmonization?

The patchwork of national-level cryptocurrency regulations around the world raises the question of whether international regulatory harmonization is needed. In general, major financial regulatory differences among countries can create instability. Regulatory differences can lead to an accumulation of under-regulated activities, financial institutions may engage in regulatory arbitrage, countries may engage in a regulatory race-to-the-bottom, and lax regulation in one country can cause contagious crises around the world.[45] Countries have worked together in the past to harmonize various financial regulations, including capital standards (the Basel Accords) and shadow-banking activities (G20 regulatory reforms following the global financial crisis in 2008–2009).

Several policymakers have argued for greater harmonization of cryptocurrency regulations across countries. The G7 finance ministers and central bank governors agreed in 2018 that international coordination on cryptocurrencies is needed to ensure that regulations are effective in a globally interconnected financial system.[46] The G20 finance ministers and central bank governors pledged to work with international bodies to monitor the risks associated with cryptocurrencies and to assess multilateral responses as needed.[47] Then-Managing Director of the International

[43] Ibid.

[44] "Regulation of Cryptocurrency Around the World", Global Legal Research Center, Law Library of Congress, June 2018.

[45] Jeffry Frieden, "The Governance of International Finance", *Annual Review of Political Science*, vol. 19, no. 33–48 (December 2015).

[46] "Chair's Summary: G7 Finance Ministers and Central Bank Governors' Meeting", *Whistler*, British Columbia, Canada, June 2, 2018.

[47] G20 Finance Ministers and Central Bank Governors Communique, Buenos Aires, Argentina, July 23, 2018.

Monetary Fund (IMF) Christine Lagarde argued that international regulation and supervision of cryptocurrencies is "inevitable." Additionally, the editorial board of the *Financial Times* argues that a coordinated international regulatory framework for the "wild west" of cryptocurrencies is long overdue.[48]

Some initial international efforts at harmonization of cryptocurrency regulations are proceeding (see textbox below), although more systematic coordination remains elusive. A more aggressive adoption of a one-size-fits all international regulatory structure for cryptocurrencies could have costs, however. It could create distortions, have unintended consequences, and impede innovation, a particular concern in the fast-changing cryptocurrency market. Additionally, the macroeconomic risks associated with cryptocurrencies have been relatively limited to date; in 2018, the Financial Stability Board (FSB), which promotes international financial stability by coordinating national financial authorities and international standard-setting bodies found that cryptocurrency markets do not currently pose a material risk to global financial stability.[49]

International Efforts for Cryptocurrency Regulation Coordination

Perhaps most prominently, the **Financial Action Task Force (FATF)**, which promotes effective implementation of legal, regulatory, and operational measures for combatting money laundering and terrorist financing, has adapted its recommendations to clarify their application to cryptocurrencies, including recommending tighter oversight of cryptocurrency exchanges to prevent money laundering.[50]

Additionally, two international standard setting bodies have engaged on questions pertaining to cryptocurrency regulation. The **Basel Committee on Banking Supervision**, a committee of banking supervisory authorities, published guidance on cryptocurrencies for banks focusing on due diligence, governance and risk management, disclosure, and supervisory dialogue.[51] The **International Organization of Securities Commissions (IOSCO)**, an international association of securities regulators, has developed a consultation network where members can discuss ICO issues and is requesting comments on issues pertaining to cryptocurrency exchanges.[52]

Could Digital Currencies Go Mainstream?

To date, cryptocurrencies have been a relatively small, niche market, dominated by specialized entities and firms and used among a small set consumers.[53] The proliferation of cryptocurrencies has generated interest among some Governments and large multinational corporations (MNCs). If Governments and MNCs move into the digital currency market, the usage of digital currencies could dramatically increase, which would have policy implications for the United States.

Digital Fiat Currencies

Interest is growing among some Governments in creating digital versions of their fiat currencies. Digital fiat currencies would be exchanged electronically but, unlike

[48] Zahraa Alkhalisi, "IMF Chief: Cryptocurrency Regulation Is 'Inevitable'", CNN, February 11, 2018; Editorial Board, "Cryptocurrency Wild West Is Crying Out for a Principled Sheriff", *Financial Times*, September 25, 2018.

[49] "FSB Sets Out Potential Financial Stability Implications From Crypto-Assets", Financial Stability Board, October 10, 2018.

[50] "FATF Reporting to the G20 Leaders' Summit", Financial Action Task Force, June 2019; John O'Donnell and Tom Wilson, "Global Money-Laundering Watchdog Launches Crackdown on Cryptocurrencies", Reuters, June 21, 2019

[51] "Statement on Crypto-Assets", Basel Committee on Banking Supervision, March 13, 2019.

[52] "IOSCO Board Communication on Concerns Related to Initial Coin Offerings (ICOs)", International Organization of Securities Commissions (IOSCO), January 18, 2018; "Issues, Risks, and Regulatory Considerations Relating to Crypto-Asset Trading Platforms", International Organization of Securities Commissions, May 2019.

[53] A poll conducted in 2018 found that 92 percent of Americans do not own any cryptocurrencies, primarily citing lack of interest or practical need. Peter Terlato, "Here's Why Americans Aren't Buying Cryptocurrencies", Finder.com, March 20, 2018.

cryptocurrencies, would serve as legal tender. There are a wide range of proposals and forms that digital fiat currencies could take. To date, countries are primarily exploring digital fiat currencies as a way to raise money, avoid sanctions, or ensure a safe and efficient payment system.

Sovereign Cryptocurrencies

Some Governments have launched or are considering a blockchain-based legal currency to run in parallel with their traditional fiat currency. The most prominent example to date is Venezuela. In December 2017, President Maduro of Venezuela announced plans to launch a new digital fiat currency, the "petro," which would use blockchain technology and be backed by oil reserves and oil commodities.[54] Maduro hoped that creating and selling a new digital currency could provide the cash-strapped Government with a fresh infusion of funds. Maduro also stressed that the petro would help Venezuela "advance in issues of monetary sovereignty, to make financial transactions and overcome the financial blockade," an apparent reference to U.S. sanctions that restrict Venezuela's access to U.S. financial markets. There were, and continue to be, a number of questions about the currency, including how the oil guarantee works.

The Venezuelan Government launched the petro in February 2018 through a private presale that went through mid-March. The Government claims it raised $3.3 billion,[55] but the amount raised has not been confirmed by an independent audit.[56] Amidst historically high inflation of its fiat currency, the bolivar, the Venezuelan Government in August 2018 devalued the bolivar by about 95 percent, renamed it the "sovereign bolivar," and pegged it to the petro.[57] Nevertheless, the petro is not being circulated within Venezuela or sold on any major cryptocurrency exchange, and some analysts have called the petro a scam.[58] Iran and Russia have also considered issuing their own cryptocurrencies to evade sanctions, although the details and status of such plans are unclear.[59]

The Marshall Islands is also pursuing the launch of a cryptocurrency, the "Sovereign" (SOV). The SOV would become the Marshall Islands' second legal currency and run parallel to the U.S. dollar. By international agreement with the United States (the Compact of Free Association), the U.S. dollar is legal tender in the Marshall Islands.[60] The primary motivation for the cryptocurrency is to raise revenue for the Government; the Marshall Islands is a small country at risk for natural disasters and reliant on the United States for foreign aid. In February 2018, the Marshall Island's parliament passed legislation to lay the groundwork for the digital decentralized currency. In June 2019, the Government established a nonprofit organization to develop, implement, and maintain the infrastructure for the SOV.[61]

The IMF has raised a number of concerns about the SOV, such as:

- the likelihood that the SOV could to become an effective means of exchange;
- the SOV poses serious AML/CFT risks; fluctuations in the SOV's value could create financial risks for the Government;
- the SOV requires heavy reliance on a third-party to develop and manage the currency;
- the SOV could be a target for cyberattacks;

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[54] Alexandra Ulmer and Deisy Buirago, "Enter to 'Petro': Venezuela To Launch Oil-Backed Cryptocurrency", Reuters, December 3, 2017.

[55] Eric Lam, "Here's What Maduro Has Said of Venezuela's Petro Cryptocurrency", Bloomberg, August 20, 2018.

[56] Aaron Mak, "What Does It Mean for Venezuela To Peg Its New Currency to a Cryptocurrency?", *Slate*, August 22, 2018.

[57] Sam Jacobs, "Venezuela Just Devalued the Bolivar by 95% and Pegged It to a Cryptocurrency", *Business Insider*, August 20, 2018.

[58] Brian Ellsworth, "Special Report: In Venezuela, New Cryptocurrency Is Nowhere To Be Found", Reuters, August 30, 2018; Katia Moskvitch, "Inside the Bluster and Lies of Petro, Venezuela's Cryptocurrency Scam", *Wired*, August 22, 2018.

[59] Yaya Fanusie, "Blockchain Authoritarianism: The Regime in Iran Goes Crypto", *Forbes*, August 15, 2018; Max Seddon and Martin Arnold, "Putin Considers 'Cryptorouble' as Moscow Seeks To Evade Sanctions", *Financial Times*, January 1, 2018. For more on the use of digital currencies to evade sanctions, see CRS "In Focus IF10825, Digital Currencies: Sanctions Evasion Risks", by Rebecca M. Nelson and Liana W. Rosen.

[60] "Republic of the Marshall Islands: Selected Issues", International Monetary Fund, August 10, 2018.

[61] "Marshall Islands Sets up Non-Profit To Oversee National Digital Currency", *Coindesk*, June 6, 2019.

- and the legal implications of the SOV are complicated by the international agreement with the United States establishing the U.S. dollar as legal tender in the Marshall Islands.[62]

Central Bank Digital Currencies

Some Governments are also exploring streamlining the electronic payment system for fiat currencies, to provide a more robust and legal alternative to cryptocurrencies. In particular, some Governments are considering whether and, if so how, central banks could make digital fiat currencies directly available to the public, obviating the need for the intermediaries to complete transactions (as is the case currently).[63] Transactions involving such "central bank digital currencies" could be recorded using distributed ledger technology, but alternative ledgers (including centralized ledgers) would also be possible.

For example, Sweden's central bank, the Riksbank, is considering the adoption of an "e-krona."[64] The e-krona is motivated by the decline in the use of cash in Sweden and the increasing reliance on private payment processors. The Riksbank has argued that the e-krona is necessary to maintain sovereign control over the payment system, and to ensure stability and trust in Sweden's monetary system, particularly during crises. The e-krona would be issued by the Riksbank and represent a claim on the Swedish State. The e-krona would be denominated in Swedish krona (it would not have a different value system from its traditional fiat currency, the krona) and the Riksbank would have responsibility for the e-krona's underlying infrastructure. The Riksbank is currently considering a pilot e-krona project to assess its viability. Other central banks including Canada, China, and Uruguay are also considering similar initiatives, and the Eastern Caribbean Central Bank (ECCB), the monetary authority for eight island economies, launched a pilot in July 2019.[65]

In contrast, many central banks in advanced economies, including the U.S. Federal Reserve,[66] the European Central Bank (ECB),[67] the Bank of England,[68] the Reserve Bank of Australia,[69] the Bank of Israel,[70] and the Reserve Bank of New Zealand,[71] have argued against the benefits of digital fiat currencies or announced that they do not intend to adopt a digital fiat currency at this time. To varying degrees, they have questioned the need for digital fiat currencies and cautioned that digital fiat currencies could be prone to hacking and undermine financial stability.

Implications for the United States

If other Governments create and adopt digital fiat currencies, the policy implications for the United States would largely depend on which countries are involved and how their digital fiat currencies are structured. For example, one of the more nefarious motivations for a digital fiat currency—sanctions evasion—would raise issues pertaining to the enforcement of U.S. sanctions. The adoption of digital fiat currencies by many other major economies could raise concerns about maintaining the role of the U.S. dollar as a reserve currency in the global economy, although the central banks of major advanced economies have largely indicated their intent to refrain from doing so at this time. New digital fiat currencies could also raise concerns about the potential for new vulnerabilities in the international economy

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[62] "Republic of the Marshall Islands: Selected Issues", International Monetary Fund, August 10, 2018.

[63] Tommaso Mancini-Griffoli, Maria Soledad Martinez Peria, Itai Agur, et. al, "Casting Light on Central Bank Digital Currency", IMF Staff Discussion Note, November 2018; "Central Bank Digital Currencies", Bank for International Settlements, March 2018; Claire Jones, "Central Bank Plans To Create Digital Currencies Receive Backing", *Financial Times*, June 30, 2019.

[64] Gabriel Soderberg, "Are Bitcoin and Other Crypto-Assets Money?" *Economic Commentaries* No. 5, Riksbank, March 14, 2018; and "The E-Krona Project, Report 2", Riksbank, October 26, 2018.

[65] Christine Lagarde, "Winds of Change: The Case for New Digital Currency", Speech at Singapore FinTech Festival, November 14, 2018; "ECCB Launches a Digital Currency Pilot", Dominican News Online, July 22, 2019.

[66] Remarks by Federal Reserve Chair Jerome Powell at U.S. Congress, House Financial Services Committee, Monetary Policy and the Economy, 115th Cong., 2nd sess., July 18, 2018.

[67] Francesco Canepa, "ECB Has No Plan To Issue Digital Currency: Draghi", Reuters, September 14, 2018.

[68] "Digital Currencies", Bank of England, August 22, 2018.

[69] Tony Richards (Head of Payments Policy Department at the Reserve Bank of Australia), "Cryptocurrencies and Distributed Ledger Technology", Speech at Austrian Business Economists Briefing, Sydney, June 26, 2018, *https://www.rba.gov.au/speeches/2018/sp-so-2018-06-26.html.*

[70] "The Bank of Israel Published a Summary of the Work of the Team To Examine Central Bank Digital Currency", June 11, 2018, *https://www.boi.org.il/en/NewsAndPublications/PressReleases/Pages/6-11-18.aspx.*

[71] Geoff Bascand (Governor of the Reserve Bank of New Zealand), "In Search of Gold: Exploring Central Bank Digital Currency", Speech, June 26, 2018, Auckland, *https://www.rbnz.govt.nz/research-and-publications/speeches/2018/speech2018-06-25.*

and the protection of U.S. consumers purchasing, holding, and transacting in these currencies.

Cryptocurrencies Associated With Large Multinational Corporations

Some large financial and nonfinancial MNCs are also creating or planning to create their own cryptocurrencies. In February 2019, JPMorgan, which has a presence in over 100 markets worldwide, became the first U.S. bank to create and successfully test a digital coin representing a fiat currency: the JPM Coin.[72] Goldman Sachs, a major U.S. multinational investment bank and financial services company, is conducting extensive research on "tokenization," the process for transforming currencies or assets into tradeable digital contracts transacted through distributed ledger technology.[73]

In June 2019, Facebook, with approximately 2.4 billion active users, announced its plans for the libra, a new cryptocurrency to be backed by assets and supported by more than two dozen companies including Uber, Spotify, Mastercard, and Visa, among others. Libra would be classified as a stablecoin, because its value would be backed by a reserve of assets with a stable value. In contrast, the value of bitcoin, for example, fluctuates depending on users' beliefs about its worth. Relative to the U.S. dollar however, the value of the libra would fluctuate, because the reserve assets would be denominated in a basket of currencies. The Libra Association, the nonprofit established by Facebook in Switzerland to oversee the currency, is targeting a launch date for the libra in the first half of 2020.

Following Facebook's announcement, China's central bank is reportedly reconsidering an officially sanctioned cryptocurrency after previously banning them; there is speculation they could develop a cryptocurrency associated with WeChat.[74] WeChat is a popular messaging app in China with 1.1 billion active users and has an affiliated payment system (WeChat Pay) that transacts money in Chinese yuan and through Chinese banks.

By tapping their large customer bases and networks, these or other major institutions aspire to take cryptocurrencies mainstream. Upscaling the size of the cryptocurrency market could magnify cryptocurrency's benefits, including cheaper and easier transactions and broader financial inclusion. Their proposals also magnify existing concerns about cryptocurrency, including consumer protections and money laundering, as well as introduce new concerns about sovereign control of money, global stability, and privacy.

Debating the Merits of the Proposed Libra Cryptocurrency

Facebook has garnered far more interest and backlash against its cryptocurrency plans than other traditional financial MNCs, due to questions about Facebook's alleged lack of expertise in the banking sector, the size of its network, and concerns about its handling of user data.[75] In July 2019, the G7 finance ministers and central bank governors agreed that the libra raises "serious regulatory and systemic concerns, as well as wider policy issues, which both need to be addressed before such projects can be implemented."[76]

If the project moves forward, the libra may have the most appeal for consumers in developing countries who do not have access to traditional banking systems (the "unbanked"). The World Bank estimates that 1.7 billion adults are unbanked, yet two-thirds of them own a mobile phone that could help them access financial services.[77] The libra would provide these consumers with the ability to store and transact money digitally from mobile phones. The libra could also potentially benefit the senders and receivers of remittances by dramatically reducing fees, potentially to zero. Even among these potential users, however, there are questions about whether the libra could effectively replace cash in developing countries, currently the dominant method of payment.[78]

The libra may have less appeal to consumers in developed countries with access to traditional banking systems. Unlike fiat money held in a traditional bank account, libra holdings would not earn interest or be backed by deposit insurance. Libra users would assume foreign exchange risk by holding libra and maintaining payment obligations, such as taxes, denominated in the traditional fiat currency.

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[72] "J.P. Morgan Creates Digital Coin for Payments", JPMorgan, February 14, 2019.

[73] Alastair Marsh, "Goldman Sachs Explores Creating a Digital Coin Like JPMorgan's", *Bloomberg*, June 28, 2019.

[74] Kenneth Rapoza, "Beijing Begins Imaging a WeChat Cryptocurrency", *Forbes*, July 8, 2019.

[75] Matt Levine, "Facebook's Crypto Annoys Everyone", *Bloomberg*, July 17, 2019.

[76] "Chair's Summary: G7 Finance Ministers and Central Bank Governors' Meeting", Chantily, France, July 18, 2019.

[77] "Financial Inclusion on the Rise, but Gaps Remain, Global Findex Database Shows", World Bank Press Release, April 19, 2018.

[78] Annie Lowrey, "What Facebook Can Do for the Global Poor", *The Atlantic*, June 27, 2019.

Users would also need to accept the risk that the value of their libra holdings could change relative to the domestic fiat currency if the Libra Association changed the currency composition of the reserve basket.

The libra's reserve assets are critical to its operation, but raise a host of policy questions. Examples include the following.

- If the libra scales to the size envisioned, it is unclear how this will affect markets of "safe" assets, as the libra reserve becomes a huge buyer and holder of them.
- It is also unclear what the implications of concentrating safe assets into one private institution would be; some policymakers are already concerned about the large size of some technology and financial firms.
- There are also concerns about what would happen if the assets in the libra's reserve deteriorate; what is a safe asset one day may not be safe the next. For example, if one of the currencies in the libra's basket collapses, it could trigger a run on the libra, necessitating a broad selloff of the libra's reserve assets.[79] Depending on the size, such a selloff could trigger a significant financial crisis.

Strong regulations could address some concerns about the libra's reserve assets, but there are questions about who and how the libra would be regulated.[80] The regulatory framework is complicated by the number of jurisdictions in which Facebook is proposing to operate, and the different aspects of the libra project that could require regulation: the libra itself, the Libra Association, and Facebook's proposed libra wallet app, Calibra. In response to backlash from some regulators, the Libra Association appears to be shifting its approach. The libra's white paper asserts that it would operate as an open and largely decentralized network after 5 years. Subsequently in public statements, the Libra Association appears to be stressing that it would shoulder significant responsibility for ensuring compliance with various regulations.[81]

The libra also upends the debate about privacy and cryptocurrency. Previously, concerns about privacy in cryptocurrency markets focused on whether users had too much privacy: that by partially shielding user identities, cryptocurrencies allowed bad actors to engage in nefarious and illegal activities. The libra inverts the policy discussion to focus on protecting user data. In particular, concerns focus on how users' data on financial transactions would be protected, and not merged with user data from other Facebook platforms. Although the head of Calibra has pledged that ensuring privacy is a top priority, many analysts are more skeptical given previous scandals involving Facebook's use of user data and the dependence of Facebook's business model on collecting and monetizing user data.[82]

Conclusion

Cryptocurrencies are a relatively new market that is still rapidly evolving. Bitcoin was introduced in 2009, and initially existed in obscurity. Now thousands of different cryptocurrencies are in circulation with a value of about $270 billion. Governments have responded differently to the rise of cryptocurrencies, and a patchwork of national regulations has been developed. Given the mismatch between the international nature of cryptocurrencies, and their regulation at the national level, there is increasing discussion about whether cryptocurrency regulations need to be harmonized across countries.

Today's cryptocurrency market is much smaller than other global financial markets. However, digital currencies may have the potential to be adopted more widely, as central banks and large MNCs look to create their own digital currencies. Large-scale adoption of digital currencies could have a range of policy implications for the United States, including financial stability, consumer protections, AML/CFT, privacy considerations, and sanctions policy, among others.

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[79] David Z. Morris, "Facebook's Libra Currency Could Threaten the Global Financial System. Here's How", *Fortune*, July 18, 2019.

[80] Gregory Barber, "Everyone Wants Facebook's Libra To Be Regulated. But How?" *Wired*, July 18, 2019.

[81] Timothy B. Lee, "Facebook is Backpedaling From Its Ambitious Vision for Libra", *Ars Technica,* July 18, 2019.

[82] Testimony by David A. Marcus, Head of Calibra, Facebook, U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, Examining Facebook's Proposed Digital Currency and Data Privacy Considerations, 116th Cong., 1st sess., July 16, 2019; Frances Coppola, "The Real Threat From Facebook's Libra Coin", *Forbes*, June 30, 2019.

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JULY 30, 2019

Chairman Crapo, Ranking Member Brown, and Members of the Committee, thank you for the opportunity to testify today on the topic of Examining Regulatory Frameworks for Digital Currencies and Blockchain. As a banking law scholar, I hope to provide some perspective on the cryptocurrency industry's ambitions with regard to financial inclusion for low income Americas as well as its place in the banking regulatory landscape.

Bitcoin, cryptocurrency, and the blockchain technology on which they are based began in 2008 in the aftermath of the financial crisis. The promise and appeal of bitcoin and the cryptocurrencies that followed it is to offer a stateless alternative currency to the U.S. monetary system. The cryptocurrency industry aspires to offer a more efficient, confidential, and accessible payments system than the bank-operated payments system, which they claim is slow, outdated, inefficient and exclusionary. They claim that the banking sector has created inequalities, that it has perpetuated fraud and harmed people by their reckless risk-taking. They are frustrated by a banking sector that seems not to have their customers best interests at heart. They are absolutely right and I am grateful to them for drawing attention to the problems in the payments and finance sector. I have spent my academic career trying to illuminate and remedy these problems as well. I am especially concerned with financial inclusion and equity in banking. While I share many of the cryptocurrency industry's concerns with respect to failures of the banking industry, I do not believe cryptocurrency is the best solution to the problems of financial inclusion and equity in banking.

Specifically, one stated goal of cryptocurrencies is to establish a "public" payments system available to all.[1] In fact, such a public payments system already exists: that is the exact mission of the Federal Reserve. Congress established the Federal Reserve in 1913 to increase the integrity, efficiency and equity of U.S. payments. It was a public institution by design. According to its own charter, "the Federal Reserve was established to serve the public interest."[2] To the extent that this system is exclusionary, it is up to our democratically elected representatives to update this mission and mandate that the Fed promote efficiency and financial inclusion to the benefit of more Americans. Money itself is a public good and its creation, supply, and stability is a function of the U.S. Treasury in coordination with the Federal Reserve.[3] If there are any problems with U.S. Currency, the Constitution of the United States has authorized only this institution, Congress, to change the laws and institutions related to currency.[4] The problems of inequality and inefficiency that bitcoin and the cryptocurrency industry has set out to solve are not problems of technology, they are problems of policy. And it is in this chamber, and not in a tech startup office or anonymous white paper, that these problems must be addressed.

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[1] "Bitcoin is open-source; its design is public, nobody owns or controls Bitcoin and everyone can take part." *https://bitcoin.org/en/*

[2] *https://www.federalreserve.gov/faqs/about_14986.htm*

[3] Ricks, Morgan, and Crawford, John, and Menand, Lev, "A Public Option for Bank Accounts (Or Central Banking for All)" (December 2, 2018). Vanderbilt Law Research Paper 18-33; UC Hastings Research Paper No. 287. Available at SSRN: *https://ssrn.com/abstract=3192162* or *http://dx.doi.org/10.2139/ssrn.3192162*. James Tobin, "The Case for Preserving Regulatory Distinctions", in *Restructuring the Financial System* 167, 172 (1987) ("I think the Government should make available to the public a medium with the convenience of deposits and the safety of currency, essentially currency on deposit, transferable in any amount by check or other order. . . . The Federal Reserve Banks themselves could offer such deposits."). See also Kenneth J. Arrow, "The Organization of Economic Activity: Issues Pertinent to the Choice of Market Versus Non-Market Allocations", in *Analysis and Evaluation of Public Expenditures: The PPP System* 48 (*J. Econ. Comm. of Cong.* 1969) ("The creation of money is in many respects an example of a public good."); Charles P. Kindleberger and Robert Z. Aliber, "Manias, Panics, and Crashes: A History of Financial Crises" 19 (6th ed. 2011) ("Money is a public good."); John Cochrane, Remarks at the Federal Reserve Bank of Minneapolis, May 16, 2016 ("There's a few things that Government has a natural monopoly in: national defense, courts, property rights, and I would say money.").

[4] See Legal Tender Cases, 110 U.S. 421 (1884) ("Congress has the constitutional power to make the Treasury notes of the United States a legal tender in payment of private debts, in time of peace as well as in time of war."). See also, 18 U.S.C. § 486—*Uttering Coins of Gold, Silver or Other Metal*: "Whoever, except as authorized by law, makes or utters or passes, or attempts to utter or pass, any coins of gold or silver or other metal, or alloys of metals, intended for use as current money, whether in the resemblance of coins of the United States or of foreign countries, or of original design, shall be fined under this title or imprisoned not more than 5 years, or both."

Access to the Federal Reserve payments system is essential to full participation in commerce. Every American not only deserves the right to participate in the economy, but also to participate democratically in the monetary policy decision making that affects their lives. We do not need to replace the Federal Reserve or fiat currency to achieve that. In fact, our Congress must do just the opposite and ensure that our public institutions are achieving their mission.

The Payments System Is a Public Good and It Should Be Available to All Americans

The largest and most secure payments system in the U.S. is operated by the Federal Reserve as per its mandate.[5] The Federal Reserve's own policy mandate on payments is "to bring to payments markets an overall concern for safety and soundness, promotion of operating efficiency, and equitable access." The Fed promises that these "considerations relating to integrity, efficiency, and access to the payments system will remain at the core of the Federal Reserve's role and responsibilities regarding the operation of the payments system." As the Fed itself recognizes, "given the size, speed, and interdependencies of payments, this mission is, and will likely continue to be, even more important than it was when the Federal Reserve was established in 1913."[6]

Indeed, achieving this mission today is essential. The Federal Reserve payments system is accessed by most Americans through their banks, and yet a quarter (25 percent) of Americans are unbanked or underbanked.[7] These low-income families spend about 10 percent of their total income in fees to alternative financial service providers just to use their money.[8] Being underbanked is expensive and time-consuming as each financial transaction involves fees and hurdles.[9] The unbanked must pay fees to send and receive money, cash checks, use debit cards, and otherwise engage in commercial activities that are routine and nearly free for most Americans. In the United States, we have decided that only chartered banks and their customers can access the payments systems built, maintained, and overseen by the Federal Reserve.[10] Yet banks are not mandated to offer these services to all people. Banks can choose their customers and the communities in which they will operate physical branches.

Banks have abandoned certain low-profit communities and customers. Over the last several decades, deregulation, heightened market competition, and the subprime crises has led to wave after wave of bank mergers and a conglomerated banking industry. Industry consolidation has meant that many communities, especially in rural regions across the country are banking deserts where communities do not have a bank.[11] In these banking deserts, it is not uncommon that the only ATM in the entire area is at a gas station with fees up to $7.50 per transaction.[12] But even where banks are physically available, there remain many barriers for low-income Americans. Banks charge excessive and onerous overdraft fees and excess activity fees—fees that are lucrative for banks and disastrous for low-income con-

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[5] Federal Reserve System, Payment Systems: *https://www.federalreserve.gov/paymentsystems.htm*; Carol Coye Bensin and Scott Loftesness; "Payments Systems in the U.S." 3rd ed. (Glenbrook Partners 2010).

[6] *https://www.federalreserve.gov/paymentsystems/pfs_frpaysys.htm*

[7] 2017 FDIC National Survey of Unbanked and Underbanked Households: *https://www.fdic.gov/householdsurvey/2017/2017report.pdf*; *https://www.cnbc.com/2019/03/08/25percent-of-us-households-are-either-unbanked-or-underbanked.html.*

[8] U.S. Postal Service, "Providing Non-Bank Financial Services for the Underserved" (2014), available at *http://www.uspsoig.gov/sites/default/files/document-library-files/2014/rarc-wp-14-007.pdf.*

[9] See Mehrsa Baradaran, "How the Other Half Banks: Exclusion, Exploitation, and the Threat to Democracy", *Harvard University Press* (Oct. 2015)

[10] Structure of the Federal Reserve System: *https://www.federalreserve.gov/aboutthefed/structure-federal-reservesystem.htm.*

[11] Bank closures are not spread out evenly—93 percent of bank closings are in LMI communities. NCRC Research, "Banking Deserts in America", National Community Reinvestment Coalition (June 2017) *http://maps.ncrc.org/bankdeserts/index.html*;. Frank Bass and Dakin Campbell, "Study Finds Latest Bank Branch Closing Strike Hardest in Poor Neighborhoods", Bloomberg News (May 2, 2013) *https://www.stltoday.com/business/local/studyfinds-latest-bank-branch-closings-strike-hardest-in-poor/article_b33a4103-280f-5b3c-9754-3086de4b0070.html*. Rural America has lost over half of its banks in the last few decades and 1 in 8 communities is a banking desert. Housing Assistance Council, "The Community Reinvestment Act and Mortgage Lending in Rural America" 22 (Jan. 2015) *http://www.ruralhome.org/storage/documents/publications/rrreports/rrr-cra-in-rural-america.pdf.*

[12] "A Town With No Bank", NBC News, 2019. *https://www.nbcnews.com/news/nbcblk/how-itta-bena-mississippi-became-banking-desert-n1017686*

sumers.[13] Small accounts are not profitable for banks so they avoid them—either by leaving low income areas or repelling low income customers through fees.[14] Faced with seemingly random and punitive fees, low-income customers have taken their business to the fringe banking sector.[15]

Those who are unbanked need a way to cross the cash/digital divide so they can engage in commerce. This problem can be fixed by offering a direct checking account to all communities through the post office.[16] The United States Postal Service (USPS) operated a savings bank for much of its history and most postal services do so worldwide.[17] The post office need not engage in banking or even lending, but simply offer transaction services. Post office branches already take cash from customers and offer money orders. My postal banking proposal only requires that post offices go one step further and offer a digital checking account linked to a central payment system. Once consumers have a digital account, they can begin to use mobile banking and other FinTech services. Moreover, a low-cost savings account and the 10 percent of their income saved from payments services could diminish the need for payday lending by providing a financial buffer. My colleagues Morgan Ricks, John Crawford, and Lev Menand have suggested that the Federal Reserve should offer accounts directly to all individuals and businesses through a Fed Account, which could be offered through the post office. They argue that "restricting central bank accounts to an exclusive clientele (banks) is no longer justifiable on policy grounds if indeed it ever was."[18] These accounts would not cost taxpayers any additional money, but could in fact create profits for both the Federal Reserve and the Post Office.[19]

Another important way that banks are not meeting the needs of low-income Americans is the delay in making funds available to customers. Payments clearing—the time between when a check is deposited and when the funds can be withdrawn as cash—can take 3 to 5 business days. For families who do not have a buffer of wealth and need to spend their paychecks for food or rent, this delay is costly and onerous. In order to avoid this time gap, families often resort to checkcashers or payday lenders. Aaron Klein of the Brookings Institute claims that real-time payments could help eliminate a share of overdrafts, payday loans, and check cashing fees, and restore tens of billions a year to working families.[20] The Federal Reserve must update its processing to real-time payments clearing so that those who need

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[13] "Overdraft Fees: Compare What Banks Charge": *https://www.nerdwallet.com/blog/banking/overdraft-fees-what-banks-charge/*; "Bank overdraft fees could jump if consumer watchdog eases rule": *https://www.cnbc.com/2019/06/25/bank-overdraft-fees-could-jump-if-consumer-watchdog-eases-rule.html*; Center for Responsible Lending, "Report: FDIC Data Shows that Banks Collected $11.45 Billion in Overdraft Fees in 2017": *https://www.responsiblelending.org/media/report-fdic-data-shows-banks-collected-1145-billion-overdraft-fees-2017*; Center for Responsible Lending, "Unfair Market: The State of High-Cost Overdraft Practices in 2017": *https://www.responsiblelending.org/research-publication/unfair-market-state-high-cost-overdraft-practices-2017.*

[14] Most banks require balances of $1,500 to avoid fees on their basic accounts. Lisa J. Servon, "The High Cost, for the Poor, of Using a Bank", *New Yorker* (Oct. 9, 2013), *https://www.newyorker.com/business/currency/the-high-cost-for-the-poor-of-using-a-bank*. Abby Vesoulis, "Millions of Americans Can't Afford a Checking Account. The Post Office Could Fix That", *Time* (Aug. 7, 2018); Government Accountability Office, Community Reinvestment Act, Options for Treasury to Consider to Encourage Services and Small-Dollar Loans When Reviewing Framework (Feb. 2018), *https://www.gao.gov/products/GAO-18-244.*

[15] The rise of fringe banking, check-cashing, and payday lending was a direct result of the decline of community banks. See Mehrsa Baradaran, "How the Other Half Banks: Exclusion, Exploitation, and the Threat to Democracy", Harvard University Press (Oct. 2015).

[16] Mehrsa Baradaran, "It's Time for Postal Banking", 127 *Harv. L. Rev. F.* 165 (2014)

[17] See Mehrsa Baradaran, "How the Other Half Banks: Exclusion, Exploitation, and the Threat to Democracy", *Harvard University Press* (Oct. 2015)

[18] Ricks, Morgan, and Crawford, John, and Menand, Lev, "A Public Option for Bank Accounts (Or Central Banking for All)" (December 2, 2018). Vanderbilt Law Research Paper 18-33; UC Hastings Research Paper No. 287. Available at SSRN: *https://ssrn.com/abstract=3192162* or *http://dx.doi.org/10.2139/ssrn.3192162.*

[19] For revenue projections for the post office, see: USPS, Office of Inspector General, "Providing Non-Bank Financial Services for the Underserved" (January 27, 2014). White Paper Report No. RARC-WP-14-007. Available at *https://www.uspsoig.gov/sites/default/files/document-library-files/2014/rarc-wp-14-007.pdf.* As for Fed Accounts, as Ricks, Crawford, and Menand explain, the FedAccounts would increase revenue. "Central banks' asset portfolio returns typically exceed their interest payments and other expenses by a wide margin. These earnings are called 'seigniorage': fiscal revenue from money creation. The amounts are large. The Fed remitted $98 billion, $92 billion, and $90 billion in earnings to the U.S. Treasury Department in 2015, 2016, and 2017, respectively. FedAccounts would [sic]

[20] Aaron Klein, "Real-Time Payments Can Help Combat Inequality", March 6, 2019, *https://www.brookings.edu/opinions/real-time-payments-can-help-combat-inequality/*.

access to their hard-earned wages do not have an unnecessary delay.[21] The Federal Reserve has stated that it is studying the issue, but the recently introduced Payments Modernization Act seeks to speed the process along and mandate a real-time payments system. The technology is readily available and the U.S. is playing catch up as many other countries have already adopted real-time payments.[22]

The Federal Reserve payments system has proved secure, private, and safe and is among the most reliable in the world—but it is exclusionary. And I want to be clear about why it is exclusionary: it is not that the Federal Reserve lacks the expertise or the technology or that there is anything inherently exclusionary about their payments system; rather the Federal Reserve has not prioritized the needs of the underbanked for faster processing and retail point of contact operations. The Federal Reserve has only offered its payments system to banks—who, as profit seeking institutions, avoid the least profitable consumers. This is a problem that can and must be fixed through policy rather than outsourced to technology or banking corporations to solve. The Federal Reserve states that it has "a public-interest motivation in seeking to stimulate improvements in the efficiency of the payments system." This, according to their own mission, requires it "to provide equitable access and an adequate level of services nationwide."[23] In order to achieve this mission, the Federal Reserve must open up its payments system to all Americans. If the Federal Reserve falters in its mission, it falls in Congress' purview to enforce it.

Cryptocurrency Is Not the Way To Achieve Financial Inclusion

Since its inception a decade ago, many in the cryptocurrency industry have promised that one of the main benefits of the distributive ledger technology is to facilitate financial inclusion of the unbanked.[24] In fact, this promise was repeated in every hearing that has been held before this Committee on the topic, including the Libra hearing a few weeks ago.[25] FinTech companies have been making similar promises for just as long. Thus far, FinTech has only served the population who is already banked and blockchain use is limited to the technically savvy.[26] There is no reason to doubt the good intention of these technology companies, but I believe there is a fundamental mismatch between the problems and barriers that the unbanked face and the technological solutions being offered. What unbanked customers need are simple and safe places to save their money, and then convenient and inexpensive ways to use it. The most popular product for low-income consumers has been a very simple, and still very expensive, prepaid debit card.[27] It is accepted for all purchases and resembles a no-fee debit card from a bank. While it is possible and likely that crypto and FinTech technologies have and will help with financial inclusion efforts in countries with an underdeveloped banking system, the United States has a nationwide system of digital payments already in use.

Cryptocurrencies intend to offer the unbanked an alternative payments processing, but this only works if all employers, landlords, utilities, restaurants, stores, babysitters, dentists, and every other way that people currently spend their cash,

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[21] *https://www.americanbanker.com/news/elizabeth-warren-other-democrats-look-to-force-feds-hand-on-faster-payments*; Federal Reserve Banks, "Faster Payments Task Force", Federal Reserve Banks, 2015 (Circle, "About", 2016. Federal Reserve System, "Strategies for Improving the U.S. Payment System", January 26, 2016.

[22] *https://www.ncr.com/company/blogs/financial/real-time-payments-what-where-and-when*

[23] *https://www.federalreserve.gov/paymentsystems/pfs_frpaysys.htm*

[24] "Unbanked to Big Banks: How Crypto Facilitates Financial Inclusion": *https://www.ibm.com/blogs/blockchain/2019/04/unbanked-to-big-banks-how-crypto-facilitates-financial-inclusion/*; "How Blockchain Is Banking the Unbanked": *https://cointelegraph.com/news/how-blockchain-is-banking-the-unbanked*; "Blockchain and Financial Inclusion" (White Paper, March 2017): *https://digitalchamber.org/assets/blockchain-and-financial-inclusion.pdf.*

[25] "Our first goal is to create utility and adoption, enabling people around the world—especially the unbanked and underbanked—to take part in the financial ecosystem." Hearing Before the United States Senate Committee on Banking, Housing, and Urban Affairs July 16, 2019, Testimony of David Marcus Head of Calibra, Facebook. *https://www.banking.senate.gov/imo/media/doc/Marcus%20Testimony%207-16-19.pdf* July 16, 2019, hearing before Committee on Banking, Housing, and Urban Affairs (Senate)—Hearing to examine Facebook proposed digital currency, known as libra, and implications for consumers.

[26] See, e.g., Morgan Ricks, "Money as Infrastructure", supra note 110, at Part III.B. Michael S. Barr, Howell E. Jackson, and Margaret E. Tahyar, "Financial Regulation: Law and Policy 796" (2016); Even committed laissez faire economists like Milton Friedman and James Buchanan recognized that money creation is inexorably linked to the Government. Milton Friedman called money creation and monetary policy "an essential governmental function on a par with the provision of a stable legal framework." Milton Friedman, "A Program for Monetary Stability" 8 (1960); James M. Buchanan, "The Constitutionalization of Money", 30 *CATO J.* 251, 251 (2010) ("The market will not work effectively with monetary anarchy.")

[27] Carol Coye Bensin and Scott Loftesness, "Payments Systems in the U.S." 3rd ed. (Glenbrook Partners 2010) *https://www.federalreserve.gov/paymentsystems/pfs_frpaysys.htm*.

transition to using cryptocurrencies. In order for cryptocurrencies to be the solution to financial inclusion, they must be widely adopted and user-friendly—even for the least technologically savvy on both ends of a transaction. This is the policy equivalent of moving a mountain. Some might argue that total adoption of cryptocurrency is unnecessary to provide some measure of benefit to the underbanked, but then we are left with debating how much financial inclusion is good enough, who should be included, and still what to do about those who are left out.

Achieving a cashless commercial system is possible and I believe it to be an important policy goal. But practically speaking, it is much easier to expand the current Federal Reserve payments system to include the unbanked rather than create an entire new currency on a new technological platform, wait for wholesale adoption, and then double check to make sure the unbanked are using it.

Expanding access to already established payments systems would allow frictionless and immediate inclusion into efficient traditional financial services like the direct deposit of paychecks or writing a check, as well as newer financial services like autopay and the host of products offered by FinTech providers. In the United States, all app-based mobile banking and FinTech providers use traditional banks to access the Federal Reserve payments system. As a matter of policy, the most simple and direct path to financial inclusion is by upgrading the technology and opening the doors to our already established payments processing system. We do not need to wait for technological advances to reach banking deserts as unbanked populations continue to pay billions of dollars of their hard-earned wages to a fringe banking sector. And even if the problems with cryptocurrencies I have outlined can be addressed with technological solutions that are just around the corner, reserving the highly subsidized and public Federal banking system for the wealthy and relegating the unbanked to the private cryptocurrency markets is undemocratic. The payments problem is a policy problem not a technological problem.

New Technologies Do Not Change the Fundamental Risks of Finance and Must Not Be Exempt From Regulation

Technology has and will continue to fundamentally transform finance, but it has not and should not alter safety and soundness, privacy, or consumer protection regulations. There has yet to be an innovative new technology that has eliminated the risks and frauds and problems that financial regulation is meant to combat despite promises and hopes to the contrary. From the ATM to internet banking, FinTech, mobile banking, high frequency trading, and digital payments processing—the banking sector is constantly in a state of flux and upheaval. But the core risks that regulations are designed to address have not fundamentally changed. Cryptocurrencies are either a store of value, tradable currencies, investments, and a payments system or as some have promised, they are all of these things. There is nothing about all these things being put on the blockchain that makes it any less likely that it could lead to systemic risk, fraud, insider information, criminal activity, panics, bubbles, etc.

Before the 2008 crisis, the derivatives market was deregulated because industry experts promised that the new and innovative derivatives markets offered a perfect hedge. The counterparties, regulators were promised, would absorb all the risk. The investment banks and derivatives traders warned that outdated and unnecessary regulations were "stifling innovation." In 2000, U.S. regulators passed the "Commodity Futures Modernization Act", which quickly led to a practically unregulated $600 trillion derivatives market.[28] As financial regulators discovered in 2008, the innovative market had not hedged its risks at all, but had merely placed many of them on the books of their counterparties, like AIG. When the risks materialized, the entire banking sector was exposed. Similar promises and assumptions were made about the new and innovative money markets in the 1980s, which also led to their deregulation.[29] Money markets were essentially pegged to the dollar 1:1 (similar to Libra's strategy) and promised to be stable and liquid. It was said that they did not need to be insured by the FDIC because they were not susceptible to a run. And they were safe, until they broke the buck by three cents, threatening a potentially catastrophic run.[30] Only a Government guarantee and heavy Federal

[28] *https://corpgov.law.harvard.edu/2009/07/21/how-deregulating-derivatives-led-to-disaster/*

[29] For a history of financial markets deregulation, See Simon Johnson and James Kwak, "13 Bankers", Chapter 5 (pp. 120–152). The money markets were specifically deregulated in the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980, Pub. L. No. 96-221, 94 Stat. 132 (codified as amended in scattered sections of 12 U.S.C.).

[30] *https://dealbook.nytimes.com/2008/09/17/money-market-fund-says-customers-could-lose-money/*

Reserve involvement calmed the markets.[31] The same risks were inherent in the repo and commercial paper markets in 2008, which also all suffered runs.[32] So far, none of these cryptocurrencies have reached the level of scale where they would present a systemic threat, but if their ambitions are to be believed they will. Safety and soundness regulators and systemic risk regulators such as FSOC must make sure these markets do not present a systemic risk thread. This is especially true in the case of Libra, which is linked already with a powerful corporate monopoly.

Whether trade and investments are in tulips or South Sea stocks, CDOs, or bitcoin, asset price bubbles will create crashes and crises.[33] And with each crisis, the risks, the frauds, and the bubble is only apparent in the rearview mirror. There is no reason to believe that a new and impressive blockchain-based investment market should be exempt from bubbles, speculations, manias, panics, and other individual or systemic risks that our monetary policy and regulatory bodies have worked hard to mitigate. Many bitcoin enthusiasts are philosophically opposed to any State intervention in markets or in people's lives and see State supervision of financial transactions and regulation of markets as a major problem of our current system.[34] While I understand why that philosophy might appeals to many, I struggle to imagine why this Congress—the very body distrusted by many cryptoenthusiasts—would agree with them and willingly cede its and regulatory authority.

Most of the laws that regulate banks and financial firms were created in response to a crisis or repeated crises that have harmed people. They were passed with care and thought, through democratic means, to deal with specific recurring problems. FDIC supervision of banks and Federal deposit insurance, for example, was created because of the disastrous effects of constant banking runs and panics, culminating in the Great Depression.[35] Anti–Money Laundering, Bank Secrecy Act, Anti-terrorism, and Know Your Customer laws were created to prevent organized crime and terrorism. The Consumer Financial Protection Bureau was created because other laws had failed to protect consumers. Securities and commodities laws were designed to protect investors from fraud. There are inefficiencies and overlaps and perhaps too much regulation in parts and not enough in others. While not all of these laws are applicable to cryptocurrencies, if the cryptoindustry intends to compete in markets regulated by these laws, the industry should be regulated by them. These laws were not passed haphazardly. As this chamber certainly understands, our bicameral legislature makes laws difficult to pass. These laws and regulations were seen as necessary, were debated, and written and revised, and compromises were made through the democratic process. If these laws have become outdated or unnecessary, or if Congress believes that they are too cumbersome, then they should be repealed or changed for all applicable parties, not just newcomers. Technology and innovation cannot undermine public policy.

Bitcoin as Monetary Theory

While Congress and regulators should allow blockchain-based tech companies to experiment with and profit from novel uses and markets for blockchain, they must also recognize the ways in which a large portion of the ambitions of the cryptocurrency is an ideologically motivated endeavor that exists apart from the blockchain technology on which it is based. Specifically, bitcoin and bitcoin-like cryptocurrencies are based on assumptions and theories about money that are at odds with history and modern markets. The goal of many cryptoenthusiasts is to

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[31] James Stewart, "Eight Days: The Battle To Save the American Financial System", *The New Yorker*, Sept. 21, 2009; Niel Willardson and LuAnne Pederson, "Federal Reserve Liquidity Programs: An Update" (June 2010), available at *http://www.minneapolisfed.org/research/pub_display.cfm?id=4451* ; Alexander Mehra, "Legal Authority in Unusual and Exigent Circumstances: The Federal Reserve and the Financial Crisis" (*U. Pa. J. Bus. L.* 2011 update), at *https://www.law.upenn.edu/journals/jbl/articles/volume13/issue1/Mehra13U.Pa.J.Bus.L.221(2010).pdf.*

[32] Gary Gorton, "Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007" May 9, 2009, Federal Reserve Bank of Atlanta's 2009 Financial Markets Conference: Financial Innovation and Crisis, May 11–13, 2009. Available at *http://www.frbatlanta.org/news/conferences/09-financial_markets_agenda.cfm.* See also, Mehrling, Peter: "The New Lombard Street: How the Fed Became the Dealer of Last Resort" (Princeton Press, 2010).

[33] Charles P. Kindleberger and Robert Z. Aliber, "Manias, Panics, and Crashes: A History of Financial Crises" (6th ed. 2011).

[34] David Golumbia, "The Politics of Bitcoin: Software as Right-Wing Extremism" (2016).

[35] Piergiorgio Alessandri and Andrew G. Haldane, "Banking on the State", November 6, 2009, based on presentation at Federal Reserve Bank of Chicago 12th Annual International Banking Conference on "The International Financial Crisis: Have the Rules of Finance Changed?" September 25, 2009, 1; Richard S. Grossman, "Unsettled Account: The Evolution of Banking in the Industrialized World Since 1800" (Princeton: Princeton University Press, 2010), 29.

completely replace the current fiat currency system for a State-less and decentralized monetary system. It is understandable that many people would yearn for a different system of currency and banking after the 2008 crisis and the repeated failures of the banking industry to secure the public's trust, but our banking system and the fiat currency on which it is based is worth defending. Money has been inexorably linked with the State for as long as there has been modern markets.[36]

Since Satoshi Nakamoto's white paper, the central premise and promise of cryptocurrency has been to develop a currency that is better than fiat currency and untethered from a central bank.[37] The premise is that the Government's ability to print fiat money is a threat to economic stability, that it is inflationary, and deprives individuals of their liberties. This extreme libertarian theory envisions the eradication of all State intervention in commerce. This is a political theory and it is based on a fundamental set of assumptions about the dangers of the Federal Reserve and its role in money creation. Though many have compared the innovation of cryptocurrencies to earlier technologies like the internet, social media, or email, this analogy is not quite accurate.[38] Though the blockchain is neutral technology and it could potentially lead to major societal and market change, the theory of cryptocurrencies that operate using the distributive ledger is premised in opposition to State-created fiat currency. One popular book on bitcoin shows off that bitcoin is the "enemy of the State."[39]

The Federal Reserve was created by Congress to deal with the costly turbulence inherent to financial markets during panics. After decades of repeated banking crises, unstable credit markets, and recessions, the United States built a public payments and monetary system through democratic means with a mission to serve the public. Inspired by Walter Bagehot's analysis of sound central banking, the Federal Reserve was authorized to "avert panic" by "lend[ing] early and freely (i.e., without limit), to solvent firms, against good collateral, and at 'high rates.'"[40] And yet bitcoin-like cryptocurrencies promise to "remedy" the inflationary monetary policies of the Federal Reserve.[41] Many cryptoenthusiasts lament the loss of a fixed gold standard and decry the Federal Reserve's ability to "print money."[42] Fiat currency was created, however, because gold created inequalities, constrained credit markets, and created instability in markets.[43] The gold standard not only lead to repeated crises, but it was a boon for the wealthy who held gold and a curse for everyone else who relied on credit and wages.[44]

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[36] See, Christine Desan, "Making Money: Coin, Currency, and the Coming of Capitalism", (2014); Ricks, Morgan, "Money as Infrastructure" (March 11, 2018), *Columbia Business Law Review* (2018). Available at SSRN: *https://ssrn.com/abstract=3070270* or *http://dx.doi.org/10.2139/ssrn.3070270*. According to economists, the gold standard was the principle threat to financial stability before the United States finally availed itself of the gold standard. Golden Fetters: "The Gold Standard and the Great Depression, 1919–1939", *https://ideas.repec.org/b/oxp/obooks/9780195101133.html.*

[37] Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System": *https://bitcoin.org/bitcoin.pdf*; Alex Tapscott and Don Tapscott, "Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World" (2016); Michael Casey and Paul Vigna, "The Age of Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order" (2015).

[38] Andreas M. Antonopoulos, "The Internet of Money", 2016.

[39] Dominic Fisby, "Bitcoin: the Future of Money?" *https://www.amazon.com/Bitcoin-future-money-Dominic-Frisby/dp/1783521023*; *https://thenextweb.com/hardfork/2019/01/02/blockchain-cryptocurrency-books-2019/*

[40] Walter Bagehot ([1873] 1897), "Lombard Street: A Description of the Money Market" (New York: Charles Scribner's Sons). See, Federal Reserve: "Bagehot's Dictum in Practice: Formulating and Implementing Policies To Combat the Financial Crisis" (2009) *https://www.federalreserve.gov/newsevents/speech/madigan20090821a.htm.*

[41] *https://beincrypto.com/bitcoin-federal-reserve-centralization-inflation/*

[42] *https://www.msn.com/en-us/news/us/winklevoss-twins-bitcoin-is-gold-20/vp-AAE84IX*; See also Nathaniel Popper, "Digital Gold: Bitcoin and the Inside Story of the Misfits and Millionaires Trying To Reinvent Money" (2015); Ben Mezrich, "Bitcoin Billionaires: A True Story of Genius, Betrayal, and Redemption" (2019). Though the Federal Reserve can engage in monetary policy, only the U.S. Treasury can issue (print) new currency.

[43] *https://www.moneyandbanking.com/commentary/2019/7/6/protecting-the-federal-reserve*

[44] Poor farmers from the South and West opposed the gold standard because the rich Wall Street bankers held the gold and there wasn't enough of it to provide credit. William Jennings Bryant passionately decried the gold standard on behalf of the poor farmers he represented. Bryan, voicing the discontent of many during this era, which he framed as a "struggle between the idle holders of idle capital and the struggling masses who produce the wealth and pay the taxes of this country." "Official Proceedings of the Democratic National Convention Held in Chicago, Illinois, July 7, 8, 9, 10, and 11, 1896", in *The Annals of America*, Vol. 12, *1895–1904: Populism, Imperialism, and Reform* (Chicago: Encyclopedia Britannica, Inc., 1968), 100–105.

The Federal Reserve was explicitly mandated by Congress to foster an elastic currency.[45] Our money system is an electronic debt-based fiat currency with all monetary policy powers delegated to the politically insulated Federal Reserve. The Federal Reserve can expand the money supply as needed. The U.S. Dollar's elasticity and the Federal Reserve's ability to expand its supply is a feature—not a bug—of the U.S. currency regime and a result of purposeful institutional design. This is one reason the U.S. Dollar is the world's most valued and stable currency.[46] The Federal Reserve was able to be the lender of last resort worldwide and Quantitative Easing restored the world's economy to health (with the caveat that the recovery was not spread equally).[47] The Federal Reserve enables credit to course through economic channels through its reserve balances and monetary policy.[48] To the extent that inflation is a current threat—and all evidence leads in the opposite direction—Congress has authorized the Federal Open Market Committee (FOMC) to take the appropriate actions necessary.[49]

Cryptocurrencies promise to remove trust from money. They say that the ledger and the decentralized network will replace the need for a trusted intermediary, like a Government, by verifying each transaction.[50] But verifying transactions is only a small part of the role played by the FDIC, the Federal Reserve, and U.S. Treasury in lending credibility to the U.S. currency and enabling its wide use and acceptance. Trust in money requires a strong and reliable Government infrastructure—as failed historical experiments with private notes issued by banks and private deposit insurance schemes have made clear.[51] Successful money creation has always been tied to Governments.[52] A healthy financial system relies on broad trust and to date, only the full faith and credit of the Federal Government backing its currency has been able to provide the level of stability, responsiveness and flexibility that has yielded a worldwide trust in the dollar. Our evolved combination of Federal deposit insurance backed by U.S. Treasury guarantee has been able to provide the trust and stability necessary to support modern markets.[53]

Conclusion

There are inequalities and problems in the U.S. banking system and they must be fixed, but they must be fixed through democratic means. Cryptocurrencies want to take over where our public institutions have failed. We should heed the criticism

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[45] "An Act to provide for the establishment of Federal reserve banks, to furnish an elastic currency, to afford means of rediscounting commercial paper, to establish a more effective supervision of banking in the United States, and for other purposes." The Federal Reserve Act of 1913, *https://www.federalreserve.gov/aboutthefed/officialtitle-preamble.htm*.

[46] Eswar S. Prasad, "The Dollar Trap: How the U.S. Dollar Tightened Its Grip on Global Finance" (Princeton: 2014), *https://press.princeton.edu/titles/10182.html.*

[47] Adam Tooze; "Crashed: How a Decade of Financial Crisis Changed the World" (2018); J. Lawrence Broz, P, "The Federal Reserve as Global Lender of Last Resort, 2007–2010", London School of Economics, *http://eprints.lse.ac.uk/60951/1/dp-30.pdf.*

[48] James Tobin, "Commercial Banks as Creators of 'Money'" (1963). Cowles Foundation for Research in Economics, Yale University. No. 159, 6–7. McLeay, Radla, and Thomas, "Money Creation", 16.

[49] *https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy*

[50] In fact, some cryptocompanies have already recognized the need for a trusted intermediary and have created a central authority. 121 See, e.g., Brian Fung, "Move Deliberately, Fix Things: How Coinbase Is Building a Cryptocurrency Empire", *Wash. Post*, May 17, 2018 (describing Coinbase's role as a major cryptocurrency intermediary).

[51] See James A. Kahn, "Another Look at Free Banking in the United States", *American Economic Review* 75 (1985), 881. Available at *http://www.jstor.org/discover/1821369?sid=21105644997413&uid=2&uid=2134&uid=70&uid=3739256&uid=3739616&uid=4*; Richard S. Grossman, "Unsettled Account: The Evolution of Banking in the Industrialized World Since 1800" (Princeton: Princeton University Press, 2010); Bray Hammond, "Banks and Politics in America: From the Revolution to the Civil War" (Princeton: Princeton University Press, 1991).

[52] See, Christine Desan, "Making Money: Coin, Currency, and the Coming of Capitalism", (2014); Ricks, Morgan, "Money as Infrastructure" (March 11, 2018), *Columbia Business Law Review* (2018). Available at SSRN: *https://ssrn.com/abstract=3070270* or *http://dx.doi.org/10.2139/ssrn.3070270*. Michael McLeay, Amar Radla, and Ryland Thomas, "Money Creation in the Modern Economy", *Quarterly Bulletin* 54 (Bank of England, 2014): 16. Available at *http://www.bankofengland.co.uk/publications/Pages/quarterlybulletin/2014/qb14q1.aspx* (last accessed Nov. 9, 2014). James Tobin, "Commercial Banks as Creators of 'Money'" (1963). Cowles Foundation for Research in Economics, Yale University. No. 159, 6–7. McLeay, Radla, and Thomas, "Money Creation", 16.

[53] Alessandri and Haldane "Banking on the State", 7. When the FDIC fund dipped into the red during the financial crisis, only a promise from the U.S. Treasury that they would guarantee all deposits could calm markets. "Crisis and Response: An FDIC History, 2008–2013", *https://www.fdic.gov/bank/historical/crisis/overview.pdf.*

of this industry, but we should not give up on the mission and promise of our public institutions. It was Congress that charged the Federal Reserve with its mission to provide equitable access. Congress that created fiat currencies. Congress that authorized the Securities and Commodities Commissions, the FDIC, and other regulatory agencies. If Congress wants to foster financial inclusion or a different monetary system, it is the duty of Congress as the representatives of the people to authorize and charge the Federal Reserve with creating an inclusive and effective payments system or with a new monetary regime.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR WARREN FROM JEREMY ALLAIRE

Q.1. In your written testimony, you state, "It is incorrect to think that U.S. cryptocompanies are unregulated."[1] The United States, however, does not have a comprehensive and coordinated framework to oversee digital currencies. Instead, the United States currently has a patchwork regulatory framework, from bureaus within the Treasury Department, the Securities and Exchange Commission, and the Commodity Futures Trading Commission.

Is the current patchwork of Federal regulations of digital currencies adequate to protect consumers? If so, why? If not, who should regulate digital currencies?

A.1. Response not received in time for publication.

Q.2. Is the current patchwork of Federal and State data privacy and cybersecurity laws, standards, and best practices that apply to different products and industries adequate to protect consumers? If so, why? If not, who should regulate digital currencies?

A.2. Response not received in time for publication.

Q.3. Please describe all cybersecurity measures that your company is taking to protect sensitive financial and other data of your customers.

A.3. Response not received in time for publication.

Q.4. In your written testimony, you state, "Billions of people lack basic access to financial services. Those who do have access face a system with exorbitant fees and excessive time delays—limiting economic opportunity and removing real value from the economy."[2] A recent FDIC survey, however, found that a quarter of Americans are unbanked or underbanked,[3] and Professor Mehrsa Baradaran's written testimony states, "Thus far, FinTech has only served the population who is already banked and Blockchain use is limited to the technically savvy."[4] Additionally, the Federal Reserve announced that it will create a real-time payments system to make paychecks and money transfers available for use more immediately.

How will digital currencies reach consumers who do not have a bank account or have bank accounts but still rely on the fringe banking sector, like the payday loan industry, to make ends meet? Please provide specific details.

A.4. Response not received in time for publication.

Q.5. Why have digital currencies thus far failed to reach these consumers, and what can the digital currency sector do to address this lack of access? Why have these policies not yet been implemented?

A.5. Response not received in time for publication.

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[1] Written testimony of Jeremy Allaire to the U.S. Senate Committee on Banking, Housing, and Urban Affairs, July 30, 2019, *https://www.banking.senate.gov/imo/media/doc/Allaire%20Testimony%207-30-19.pdf.*

[2] Id.

[3] CNBC, "25% of U.S. households are either unbanked or underbanked," Erin Barry, March 9, 2019, *https://www.cnbc.com/2019/03/08/25percent-of-us-households-are-either-unbanked-or-underbanked.html.*

[4] Written testimony of Mehrsa Baradaran to the U.S. Senate Committee on Banking, Housing, and Urban Affairs, July 30, 2019, *https://www.banking.senate.gov/imo/media/doc/Baradaran%20Testimony%207-30-l9.pdf.*

Q.6. You state, "The result of the uncertain and restrictive regulatory environment has led many digital asset projects and companies to domicile outside of the United States and to block U.S. persons and businesses from accessing products and technologies,"[5] including your own. You also suggest that Congress adopt legislation that would change existing commodities, securities, and banking laws.

Many laws that regulate banks and the financial industry were created in response to financial crises with the intention of protecting consumers and our economy. Please explain in detail the laws that you suggest Congress should change and how you suggest Congress amend or repeal these laws.

A.6. Response not received in time for publication.

Q.7. Please explain how your suggested changes to existing laws would not negatively impact identity, privacy, and data security.

A.7. Response not received in time for publication.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR CORTEZ MASTO FROM JEREMY ALLAIRE

Q.1. What are the implications for privacy and widespread surveillance with central bank digital currencies like the one announced in China?

A.1. Response not received in time for publication.

Q.2. Can you explain the tension between the right to deletion and how cryptocurrencies like libra and others work?

A.2. Response not received in time for publication.

Q.3. Should we be worried that, if widely adopted, currencies like libra will substantially limit the ability of countries to use capital controls in times of financial crisis?

A.3. Response not received in time for publication.

Q.4. Can you explain how so-called "smart contracts" work?

A.4. Response not received in time for publication.

Q.5. Certain factors in contract law such as frustration, duress, undue influence, or misrepresentation need subjective human interpretation of judgement on a case-by-case basis, how is this possible under smart contracts?

A.5. Response not received in time for publication.

Q.6. Are there steps Federal regulators can take to protect investors from fraudulent ICOs? What are they?

A.6. Response not received in time for publication.

Q.7. Should cryptocurrencies have the same investor protections, the same rules against market manipulation and market fraud? Should they have adequate disclosures and investor protections? The same as bonds and stocks have?

A.7. Response not received in time for publication.

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[5] Written testimony of Jeremy Allaire to the U.S. Senate Committee on Banking, Housing, and Urban Affairs, July 30, 2019, *https://www.banking.senate.gov/imo/media/doc/Allaire%20Testimony%207-30-19.pdf.*

Q.8. Can you describe steps owners of cryptocurrencies should do to prevent thefts via mobile phone hacks? What about the exchanges themselves? And the phone companies? And Federal and State agencies?

A.8. Response not received in time for publication.

Q.9. How can we either avoid mobile phone hacks or tell people that doing financial business on a mobile phone could open you up to theft?

A.9. Response not received in time for publication.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR SINEMA FROM JEREMY ALLAIRE

Q.1. Blockchain has been presented as an opportunity to better manage digital identities. What are the potential benefits of using a decentralized system to verify an individual's identity?

Q.1. Response not received in time for publication.

Q.2. Will those benefits attract criminals to take advantage of a decentralized system?

A.2. Response not received in time for publication.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR WARREN FROM REBECCA M. NELSON

Q.1. In your written testimony, you state, "Regulatory frameworks in many countries are still evolving, and countries are taking different approaches. Countries often have differing working or legal definitions of cryptocurrencies and are developing differing regulations across a range of issues. Some countries are applying or adapting existing regulations to cryptocurrencies and others are developing new regulations specifically focused on cryptocurrencies."[1]

Please provide details for how cryptocurrencies are currently regulated in the United States, including the application of securities laws, tax treatments, application of anti–money laundering and other regulations.

A.1. In the United States, existing financial regulations have been applied to cryptocurrencies. David Perkins, CRS Specialist in Macroeconomic Policy, provided this response:[2]

Securities Regulations: According to the Securities and Exchange Commission (SEC), ICOs may qualify as securities offerings subject to regulation under the Federal securities laws.[3] Whether an ICO qualifies as a securities offering has important legal implications. Under Section 5 of the Securities Act, an issuer of securities must either (1) file a registration statement with the SEC containing a variety of information about the issuer and its business, or (2) conduct the offering pursuant to a specific exemption from registra-

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[1] Written testimony of Rebecca M. Nelson to the U.S. Senate Committee on Banking, Housing, and Urban Affairs, July 30, 2019, *https://www.banking.senate.gov/imo/media/doc/Nelson%20Testimony%207-30-19.pdf.*

[2] Also see CRS Report R45427, "Cryptocurrency: The Economics of Money and Selected Policy Issues", by David W. Perkins and CRS Report R45301, "Securities Regulation and Initial Coin Offerings: A Legal Primer", by Jay B. Sykes.

[3] Initial Coin Offerings, Sec. and Exch. Comm'n, *https://www.sec.gov/ICO*; Clayton Statement, supra n. 2.

tion. In addition, the Securities Exchange Act imposes certain continuous disclosure obligations on securities issuers and anti-fraud liability on securities issuers and sellers.[4] Moreover, the platforms on which securities trade must register with the SEC as "securities exchanges" in certain circumstances.[5]

Money Laundering: The Department of the Treasury's Financial Crimes Enforcement Network (FinCEN) has issued guidance explaining how its regulations apply to the use of virtual currencies—a term that refers to a broader class of electronic money that includes cryptocurrencies. FinCEN's guidance clarifies the application of the Bank Secrecy Act and associated regulations to three categories of individuals who deal in virtual currencies:

- *Exchangers:* Under FinCEN's guidance, a virtual currency "exchanger" is "a person engaged as a business in the exchange of virtual currency for real currency, funds, or other virtual currency";
- *Administrators:* Under FinCEN's guidance, a virtual currency "administrator" is "a person engaged as a business in issuing [putting into circulation] a virtual currency, and who has the authority to redeem [to withdraw from circulation] such virtual currency";
- *Users:* Under FinCEN's guidance, a virtual currency "user" is "a person that obtains virtual currency to purchase goods or services."

In its guidance FinCEN has explained that virtual currency exchangers and administrators qualify as money services businesses (MSBs) that must register with FinCEN, report suspicious transactions, and maintain anti–money laundering compliance programs that meet certain minimum standards.[6] Many State laws also impose registration requirements on businesses engaged in money transmission, though regulations of such business vary from State to State.[7] In contrast, FinCEN has indicated that virtual currency users do not qualify as MSBs.

Tax Treatment: The Internal Revenue Service (IRS) has issued guidance stating that it will treat virtual currencies as property (as opposed to currency), meaning users owe taxes on any realized gains whenever they dispose of virtual currency, including when they use it to purchase goods and services.[8] The guidance further indicates that if an employee is paid in virtual currency, the payment will be taxed as wages.

Consumer Protections: The way cryptocurrencies are sold, exchanged, or marketed can subject cryptocurrency exchanges or other cryptocurrency-related businesses to generally applicable consumer protection laws. For example, Section 5(a) of the Federal Trade Commission Act (P.L. 63-203) declares "unfair or deceptive acts or practices in or affecting commerce" unlawful and empowers

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[4] See 15 U.S.C. §§78o(d), 78j(b); 17 CFR §240.10b-5.
[5] 15 U.S.C. §78f.
[6] 31 CFR Part 1022, Subpart C.
[7] Jennifer Moffit, "The Fifty U.S. States and Cryptocurrency Regulations", *Coin ATM Radar*, July 27, 2018, at *https://coinatmradar.com/blog/the-fifty-u-s-states-and-cryptocurrency-regulations/*. Hereinafter Moffit, "The Fifty U.S. States".
[8] IRS, "Virtual Currency Guidance", *https://www.irs.gov/pub/irs-drop/n-14-21.pdf*.

the Federal Trade Commission (FTC) to prevent people and most companies from engaging in such acts and practices.

Title X of the Dodd–Frank Act (P.L. 111-203) also grants the Consumer Financial Protection Bureau (CFPB) certain rulemaking, supervisory, and enforcement authorities to implement and enforce certain Federal consumer financial laws that protect consumers from "unfair, deceptive, or abusive acts and practices."[9] These authorities apply to a broad range of financial industries and products, and they arguably could apply to cryptocurrency-based financial products and services as well.

In addition, all States have laws against deceptive acts and practices, and State regulators have enforcement authorities that could be exercised against cryptocurrency-related businesses.[10] Additional consumer protections generally are applied to cryptocurrency exchanges at the State level through money transmission laws and licensing requirements.[11] Money transmitters, including cryptocurrency exchanges, must obtain applicable State licenses and are subject to State regulatory regimes applicable to the money transmitter industry in each State in which they operate. For example, money transmitters generally must maintain some amount of low-risk investments and surety bonds—which are akin to an insurance policy that pays customers who do not receive their money—as safeguards for customers in the event they do not receive money that was to be sent to them.[12]

Q.2. A patchwork of Federal and State data privacy and cybersecurity laws, standards, and best practices apply to different products and industries. Please describe all relevant privacy and security frameworks that will govern cryptocurrencies.

A.2. [Chris Jaikaran, CRS Analyst in Cybersecurity Policy, provided the response for 1(B), including subquestions 1(B)(a) and 1(B)(b):]

Many Federal laws address data privacy. These laws generally fall into two categories: (1) laws addressing certain populations (e.g., the Children's Online Privacy Protection Act, COPPA, governing the protection of children's digital information, P.L. 105-277); and (2) laws addressing certain industries (e.g., the Gramm–Leach–Bliley Act, GLBA, governing data protection in the financial services industry, P.L. 106-102).[13] For the financial services indus-

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[9] 15 U.S.C. 5511.

[10] Nicholas Gess and Andrew Ray, "State Attorneys General to FinTech Companies: Eyes on Cryptocurrencies", in *All Things FinReg*, a blog of Lexology, July 31, 2018, at *https://www.lexology.com/library/detail.aspx?g=baaab9f9-af12-49e6-99d5-b063b0e61533*.

[11] Matthew E. Kohen and Justin S. Wales, "State Regulations on Virtual Currency and Blockchain Technology", *Carlton Fields Insights*, June 28, 2018, at *https://www.carltonfields.com/insights/publications/2018/state-regulations-on-virtual-currency-and-blockcha*.

[12] Conference of State Bank Supervisors and Money Transmitter Regulators Association, "The State of State Money Services Businesses Regulation and Supervision", May 2016, pp. 6–10, at *https://cca.hawaii.gov/dfi/files/2016/06/CSBS-MSB-Regulation-and-Supervision.pdf*.

[13] For a further discussion on Federal data privacy laws, see CRS Report R45631, "Data Protection Law: An Overview", by Stephen P. Mulligan, Wilson C. Freeman, and Chris D. Linebaugh. COPPA is in Title 15 U.S.C. §§6501–6506. The GLBA data protection provisions are in Title 15 U.S.C. §§6801-6809.

try, many laws are applicable for cybersecurity.[14] There are also many State laws addressing data security.[15]

Cryptocurrency platforms contain many elements which may affect the applicability of Federal data privacy laws to that cryptocurrency. A cryptocurrency itself is a medium of exchange, but there may also be a money transfer service (which takes a fiat currency or other cryptocurrency and exchanges that for the cryptocurrency) and/or a wallet (which stores the asset until a user seeks to spend it, similar to a bank account) related to the cryptocurrency platform. Each of these can be combined within the cryptocurrency platform, or be independent and separate from the platform. Depending on the implementation of that cryptocurrency platform, different rules may be applicable, and it is difficult to describe a relevant privacy or security standard without knowing the specific implementation of a platform.

Potentially, the Safeguards Rule may apply to a cryptocurrency as the platforms that govern those mediums of exchange may be considered financial service institutions. The Safeguards Rule, as promulgated by the Federal Trade Commission (FTC), states that financial institutions within the FTC's jurisdiction must protect nonpublic customer information.[16]

Q.3. Please explain if there are industry best practices for cybersecurity measures to protect sensitive financial and other data. If so, please describe them.

A.3. CRS is unable to identify clear and consistent guidance from an industry group that would constitute a collection of "best practices." This is despite observers for many critical infrastructure industries lauding the application of best practices to protect sensitive data.

Other groups have provided frameworks and guidance to assist financial institutions with protecting data on information technology systems. The National Institute of Standards and Technology (NIST) developed the *Cybersecurity Framework* to help organizations voluntarily identify cybersecurity risks and implement a process to assess and manage that risk.[17] The *Cybersecurity Framework* does not prescribe specific actions for an organization to address cybersecurity risks. But, a document map that accompanies the framework aligns its functions to categories and subcategories of activities, and provides national and international standards bodies' reference documents to help organizations use those reference documents to implement the framework.[18]

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[14] For further discussion on financial services cybersecurity laws, see CRS Report R44429, "Financial Services and Cybersecurity: The Federal Role", by N. Eric Weiss and M. Maureen Murphy.

[15] States have regulations governing financial institutions and transactions in their States. A few States also have data protection laws, such as the California Consumer Privacy Act (CCPA, see CRS Legal Sidebar LSB10213, California Dreamin' of Privacy Regulation: The California Consumer Privacy Act and Congress, by Wilson C. Freeman). A comprehensive review of all States' laws is beyond CRS's capacity given time constraints.

[16] 16 CFR §314.

[17] NIST, "Framework for Improving Critical Infrastructure Cybersecurity", report, April 16, 2018, at *https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.04162018.pdf.*

[18] NIST, "Framework Core v1.1", spreadsheet, April 16, 2018, at *https://www.nist.gov/document/2018-04-16frameworkv11core1xlsx.*

The Federal Financial Institutions Examination Council (FFIEC)[19] has published many guides and other documents for examining regulated financial institutions such as banks.[20] While the documents are designed for auditors to use during IT security examinations, financial institutions may use them to guide their cybersecurity investments and processes.

Additionally, the Carnegie Endowment for International Peace partnered with financial industry organizations to develop and publish a series of guides and checklists for financial institution board members, chief executive officers (CEOs), and chief information security officers (CISOs) to use to protect against and respond to a cybersecurity incident.[21] As these documents are meant for senior-level financial institution official use, these documents may be considered best practices for those officials, but they do not necessarily contain best practices for the administrators of technology.

Q.4. Please describe how relevant privacy and security frameworks can and should apply specifically to Libra and Calibra.

A.4. As noted earlier, Facebook has proposed the creation of a blockchain-based cryptocurrency, the libra, to serve as a global digital currency. The libra and its financial infrastructure is to be governed by the Libra Association.[22] Calibra is a digital wallet (akin to a bank account) for the libra cryptocurrency which will enable users to use the libra in financial transactions. Unlike the libra, Calibra is a Facebook product which will integrate into other Facebook products (e.g., Messenger and WhatsApp).

It is so far unclear how much customer information will reside in either Libra or Calibra and which privacy and security rules will apply.[23] The Libra Association states that the libra will include a reserve of national fiat currencies which will help to stabilize the value of the libra.[24] Depending on which national fiat currencies Libra includes in its reserves and where users are located, the Libra Association will face the regulations and requirements of those Nations. Facebook states that Calibra will comply with anti–money-laundering requirements and that it will update the documentation for Calibra closer to launch.[25]

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[19] The members of the Federal Financial Institutions Examination Council include the National Credit Union Administration (NCUA), the Office of the Comptroller of the Currency (OCC), the Board of Governors of the Federal Reserve System (Fed), and the Federal Deposit Insurance Corporation (FDIC).

[20] Federal Financial Institutions Examination Council, "IT Booklets", at *https://ithandbook.ffiec.gov/*.

[21] Carnegie Endowment for International Peace, "Cyber Resilience and Financial Organizations: A Capacity-Building Tool Box", website, 2019, at *https://carnegieendowment.org/specialprojects/fincyber/guides.*

[22] Libra Association, "An Introduction to Libra", white paper, July 23, 2019, at *https://libra.org/en-US/wp-content/uploads/sites/23/2019/07/LibraWhitePaper_en_US-Rev0723.pdf*. While Facebook developed libra, they do not intend to control the cryptocurrency, instead opting for a multiparty association to perform that role.

[23] Facebook, "Calibra: Customer Commitment", white paper, 2019, at *https://scontent-iad3-1.xx.fbcdn.net/v/t39.2365-6/65083631_355528488499253_8415273665234468864_n.pdf?_nc-cat=106&-nc-oc=AQniVTdCK3z7oUvx7Mw3hI7Xs1aYWlorVTS9kavWeNFODjDrtv8rwvpTRND3Q9z0Xes&-nc-ht=scontent-iad3-1.xx&oh=404919f1d5f6540510936ca088500c77&oe=5E0ED1C3.*

[24] Libra Association, "An Introduction to Libra", white paper, July 23, 2019, at *https://libra.org/en-US/wp-content/uploads/sites/23/2019/07/LibraWhitePaper-en-US-Rev0723.pdf.*

[25] Facebook, "Calibra: Customer Commitment", white paper, 2019, at *https://scontent-iad3-1.xx.fbcdn.net/v/t39.2365-6/65083631-355528488499253-8415273665234468864-n.pdf?-nc-cat=106&-nc-*

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Regardless of how financial regulators rule on Libra and Calibra, and which requirements will apply to these platforms, the Libra Association and Facebook can voluntarily choose to employ the *Cybersecurity Framework*, FFIEC, and/or the Carnegie Endowment for International Peace documents to improve data protection and security.

Q.5. In your written testimony, you state, "The World Bank estimates that 1.7 billion adults are unbanked, yet two-thirds of them own a mobile phone that could help them access financial services."[26] Nineteen percent of Americans[27] and 55 percent of people in emerging economies,[28] however, do not have smartphones and the numbers are worse for older, poorer and less well-educated consumer.

How can digital currencies reach consumers who do not have a bank account or have bank accounts but still rely on the fringe banking sector, like the payday loan industry, to make ends meet? Please provide specific details.

A.5. [This response was provided jointly with Cheryl Cooper, CRS Analyst in Financial Economics:]

In general, internet and mobile technology may be able to reduce the cost to provide consumer financial products, both in the United States and abroad. For example, internet-based mobile wallets may have the potential to provide access to payment services for unbanked consumers.[29] Alternatives to a banking-based payment system have been proposed or pursued in other countries, such as M-pesa, a mobile payment system that does not use banks which has achieved high levels of usage in parts of Africa.[30] Yet, although these new financial technologies have the potential to help unbanked and underbanked consumers, concerns continue to exist for internet-based products around data privacy and cybersecurity issues. In addition, these nonbank products may not always have all of the benefits of bank accounts, such as FDIC insurance or other consumer protections.

Currently, most payment services in the United States are generally layered on top of traditional electronic payment systems. To use these services, the consumer or businesses often must link them to a bank account, debit card, or credit card. The payments are still ultimately settled when the money from the payer's account is deposited in the recipient's account.

Proponents of cryptocurrencies argue that cryptocurrencies can help address the needs of consumers that do not have access to traditional bank accounts (the "unbanked") or access to traditional fi-

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[26] Conference of State Bank Supervisors and Money Transmitter Regulators Association, "The State of State Money Services Businesses Regulation and Supervision", May 2016, pp. 6–10, at *https://cca.hawaii.gov/dfi/files/2016/06/CSBS-MSB-Regulation-and-Supervision.pdf.*

[27] Pew Research Center, "Mobile Fact Sheet", June 12, 2019, *https://www.pewinternet.org/fact-sheet/mobile/.*

[28] Pew Research Center, "Smartphone Ownership Is Growing Rapidly Around the World, but Not Always Equally", Kyle Taylor and Laura Silver, February 5, 2019, *https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/.*

[29] For more information, see CFPB, "Mobile Financial Services: A Summary of Comments from the Public on Opportunities, Challenges, and Risks for the Underserved", November 2015, p. 7, *https://files.consumerfinance.gov/f/201511_cfpb_mobile-financial-services.pdf.*

[30] For more information on M-pesa, see *https://www.worldremit.com/en/how-it-works.*

nancial products and services (the "underbanked"). In theory, cryptocurrencies, by eliminating the need for financial intermediaries, allow any consumer with a smart phone or access to the internet more generally to complete financial transactions inexpensively and quickly. Access to funds more quickly might be very valuable for consumers with tight budgets, as many consumers choose alternative financial payment products such as cash checkers in order to access to their funds quickly.[31] However, whether cryptocurrency payment systems will develop to provide these services cheaper and quicker to the underserved than other technologies is unclear.

At this time, traditional payment systems are also working towards real-time payments; as a result, digital currency may not be necessary to achieve this value for consumers. Both the private sector and the Government are currently working on initiatives to make the bank payment system faster.[32] For example, the Federal Reserve plans to introduce a real-time payment system called FedNow in 2023 or 2024, which would allow consumers access to funds quickly after initiating the transfer.[33] Faster payments may also help some consumers avoid overdraft fees on checking accounts, reducing the cost of checking accounts for some consumers.[34] Note, however, that some payments that households make would also be cleared faster—debiting their accounts more quickly—which could be harmful to some of these households compared to the current system.

Q.6. Why have digital currencies thus far failed to reach these consumers, and what can the digital currency sector do to address this lack of access? Why have these policies not yet been implemented?

A.6. In general, cryptocurrencies have not been widely adopted by the population generally, including unbanked or underbanked consumers, for a variety of reasons. Cryptocurrencies are not widely accepted by businesses or individuals for payments, the prices of cryptocurrencies are highly volatile, cryptocurrencies are unevenly regulated, and many consumers find the market complicated to navigate.[35] Some regulations also make cryptocurrencies cumbersome and expensive to use. For example, in the United States, individuals owe capital gains tax on every payment made using

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[31] Aaron Klein, "The Fastest Way To Address Income Inequality? Implement a Real-Time Payment System", Brookings Institute, January 2, 2019, at *https://www.brookings.edu/research/the-fastest-way-to-address-income-inequality-implement-a-real-time-payment-system.*

[32] Several private-sector initiatives are underway to implement faster payments. For an overview, see Nacha, "Faster Payments 101", *https://www.nacha.org/system/files/2019-05/FasterPayments101_2019.pdf.* Notably, the Clearing House introduced its RTP network (with real-time settlement) in November 2017; according to the Clearing House, it currently "reaches 50 percent of U.S. transaction accounts, and is on track to reach nearly all U.S. accounts in the next several years." For more information, see The Clearing House, "The RTP Network: For All Financial Institutions", webpage, *https://www.theclearinghouse.org/payment-systems/rtp/institution.*

[33] The Fed stated, "it will likely take longer for any service, whether the FedNow Service or a private-sector service, to achieve nationwide reach regardless of when the service is initially available." Fed, "Federal Reserve Actions To Support Interbank Settlement of Faster Payments", August 5, 2019, Docket No. OP-1670, *https://www.federalreserve.gov/newsevents/pressreleases/files/other20190805a1.pdf.*

[34] CFPB, "Consumer Voices on Overdraft Programs", November 2017, pp. 16–19, *https://files.consumerfinance.gov/f/documents/cfpb-consumer-voices-on-overdraft-programs-report-112017.pdf.*

[35] "Bitcoin and Other Cryptocurrencies Are Useless", *Economist*, August 30, 2018.

cryptocurrencies, a tax that is not owed on transactions made in U.S. dollars.

In addition, cryptocurrencies may not help unbanked or underbanked consumers overcome the obstacles they face in obtaining traditional bank accounts and financial services. Unbanked households often say that their household does not have a bank account because they do not have enough money, do not trust banks, and to avoid high and unpredictable bank fees.[36] It is not clear that cryptocurrencies can address these issues. Cryptocurrency exchanges often have minimum transaction amounts, and charge fees on cryptocurrency transactions. In terms of accessibility, it is not clear that cryptocurrencies are significantly easier to access than the online banking services already offered through smartphone apps by traditional banks and nonbank financial services providers using noncryptocurrency technologies (for example, through a prepaid card or online wallet). Moreover, cryptocurrency exchanges may require documentation to verify user identities in order to comply with AML/CFT regulations, similar to the documentation required by banks complying with AML/CFT regulations.

Financial institutions and technology companies are striving to address some of these challenges to wider adoption of cryptocurrencies. For example, entrepreneurs in the cryptocurrency markets have developed stablecoins, which strive as their name suggests to provide consumers with cryptocurrencies that have stable values. Likewise, Facebook is working to introduce a new global currency that would be user-friendly and widely accepted. However, consumers—whether they are banked, unbanked, or underbanked—may be reluctant to turn to cryptocurrencies on a larger scale as long as cryptocurrencies do not provide a reliable means of exchange or store of value, key attributes of money.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR CORTEZ MASTO FROM REBECCA M. NELSON

Q.1. How expansive do you believe this problem is and what safeguards, if any, are in place to ensure bitcoin or other cryptocurrencies, are not used to finance illegal activity?

A.1. By potentially shielding user identities, cryptocurrencies can allow bad actors to engage in nefarious activities and illegal financial transactions, but it is difficult to precisely measure the extent to which cryptocurrencies are used to fund or financially facilitate illegal activities. One study by a group of academics estimates that around $76 billion of illegal activity per year involves bitcoin, nearly half (46 percent) of all bitcoin transactions.[1] [2]

Currently, countries take different approaches to anti–money laundering and countering the financing of terrorism (AML/CFT) regulations with regards to cryptocurrencies.[3] Some countries pro-

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[36] FDIC, "FDIC National Survey of Unbanked and Underbanked Households", October 2018, p. 4, *https://www.fdic.gov/householdsurvey/2017/2017report.pdf.*

[1] Information in this memorandum may be used by CRS to respond to other congressional requests and for other CRS products.

[2] Sean Foley, Jonathan R. Karlsen, and Talis J. Putnins, "Sex, Drugs, and Bitcion: How Much Illegal Activity Is Financed Through Cryptocurrencies?" SSRN Working Paper, Forthcoming in *Review of Financial Studies*, Updated December 15, 2018.

[3] FATF Report to the G20 Finance Ministers and Central Bank Governors, July 2018.

hibit cryptocurrencies outright. Other countries permit the use of cryptocurrencies by applying existing AML/CFT regulations to cryptocurrency businesses and transactions. Finally, some countries are in the process of implementing cryptocurrency-specific laws or regulations.

Some countries have undertaken efforts to coordinate AML/CFT regulations. The Financial Action Task Force (FATF), an intergovernmental organization that promotes international AML/CFT standards, has adapted its recommendations to clarify their application to cryptocurrencies.[4] However, FATF membership is not universal and its recommendations are nonbinding.

Q.2. In your opinion, what is the best way to crack down on the use of cryptocurrencies to finance illegal transactions dealing with drug and sex trafficking?

A.2. Within the focus of my testimony—international approaches to cryptocurrencies—one area policymakers may consider is to encourage regulatory harmonization across countries. With countries adopting different AML/CFT approaches to cryptocurrencies, bad actors may be able to exploit cross-country regulatory differences to engage in illegal activities. Closer coordination of AML/CFT among a broad set of countries may enhance the ability of national regulators to prevent the use of cryptocurrencies to fund illegal activities. However, some countries trying to attract cryptocurrencies and associated businesses may be concerned that more stringent regulations could deter financial innovation and limit the adoption of cryptocurrencies.

Q.3. What are the implications for privacy and widespread surveillance with central bank digital currencies like the one announced in China?

A.3. A number of central banks are examining the possibility of issuing digital currencies directly to consumers.[5] In most cases, the specifics of how such currencies will be issued and administered were they to be created have not been determined, making it is difficult to analyze how they may affect individuals' privacy. In cases where a central bank directly validates and settles transactions, information related to individuals' transaction history and the responsibility to monitor for money laundering would likely migrate (at least in part) from private financial institutions, such as banks, to the Government's central bank.

After 5 years of research, China's central bank, the People's Bank of China (PBOC), is reportedly close to issuing its own digital currency, which would serve as legal tender.[6] The Government is pursuing this initiative to retain greater control over its financial system as nongovernmental cryptocurrencies proliferate and to support internationalization of the yuan.

Although details about the proposal remain uncertain, the PBOC is expected to issue the currency and design the wallets for the dig-

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[4] "Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Providers", *FATF*, June 21, 2019.

[5] Bank for International Settlements, Committee on Payments and Market Infrastructures, *Central Bank Digital Currency*, March 2018.

[6] "China's PBOC Says Its Own Cryptocurrency is 'Close' to Release", *Bloomberg*, August 11, 2019.

ital currency. Statements from PBOC officials suggest that the digital currency is unlikely to rely on distributed ledger technology; instead, the PBOC is expected to maintain the centralized ledger that records transactions in the new digital currency. It is unlikely that users of the Chinese digital currency would have anonymity or pseudonymity with the PBOC.

The new digital currency could allow the Chinese Government to expand its surveillance capabilities. The digital currency could provide the PBOC with considerably more information about user transactions than it has about cash transactions. Roger Huang, who writes about crypto and blockchain for *Forbes*, stated his view in an August 2019 article that "given that the PBOC is ultimately accountable to the Chinese State, it is exceedingly likely that financial transactions and data will be stored for State purposes, perhaps even in the vein of adding an additional layer for social credit." [7]

Q.4. Can you explain the tension between the right to deletion and how cryptocurrencies like libra and others work?

A.4. There are questions about whether the "right to deletion" is compatible (or even possible given the validation processes currently used) with cryptocurrencies, including Facebook's proposed new global cryptocurrency, the libra. The "right to deletion," also called "right to be forgotten," generally refers to the ability to erase one's personal data, cease further dissemination of the data, and potentially have third parties halt processing of data.

Cryptocurrencies use blockchain technology, which entails the permanent storage of data. Cryptocurrency users are given a pseudonym, and every transaction involving that address is stored on a ledger maintained by the network of independent computers. Once a transaction has been recorded on the ledger, it cannot be deleted. Every transaction involving a particular pseudonym is publicly available, although the true identity of a pseudonym may not be publicly known.

Some analysts have proposed various methods to enhance cryptocurrency users' "right to deletion." [8] One proposal is deleting the encryption key that allows access to an individual's information. [9] Another proposal is storing some data off the public ledger. Many analysts, however, are skeptical that such proposals would fully address "right to deletion" concerns. [10]

Q.5. Should we be worried that, if widely adopted, currencies like libra will substantially limit the ability of countries to use capital controls in times of financial crisis?

A.5. The ability of cryptocurrency users to evade capital controls has been an ongoing concern for many that is amplified by the

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[7] Roger Huang, "China's Digital Currency Is Unlikely To Be a Cryptocurrency", *Forbes*, August 14, 2019.

[8] For example, see James Donaghue, "Solutions Suggest Blockchain Can Conform to GDPR's 'Right To Be Forgotten'", *Blockchain Land*, August 8, 2018.

[9] In general, cryptocurrencies use public ledgers that allow individuals to establish an account with a pseudonymous name known to the entire network—or an address corresponding to a public key—and a passcode or private key that is paired to the public key and known only to the account holder.

[10] "Is GDPR the End of Blockchain?" *Medium*, June 28, 2018.

global scope of Facebook's proposed cryptocurrency.[11] Capital controls are measures taken by a Government, central bank, or other regulatory body to limit the flow of foreign capital into and out of the domestic economy. There is debate about whether capital controls are helpful in smoothing debt inflows and outflows, particularly during economic crises, or whether capital controls are undesirable policy tools because they create economic distortions.

The Libra proposal is relatively new, and there are many questions about how the libra will operate in practice. Officials associated with the Libra project have pledged to delay implementation of the libra until they have fully addressed regulatory concerns and received appropriate regulatory approvals.[12] Regulators could require the Libra Association (the governing body for the libra cryptocurrency) to enforce Government capital controls in order to operate legally within their jurisdiction.

Q.6. Can you explain how so-called "smart contracts" work?

A.6. [Jay Sykes, CRS Legislative Attorney, provided this response:]

Commentators generally use the term "smart contract" to refer to an agreement whose execution is automated via computer code. For example, a borrower might enter into a "smart" loan agreement with a lender under which the borrower agrees that payments will be automatically transferred from her bank account on the first day of each month in an amount that adjusts based on a reference interest rate. Commentators have suggested that the use of software to execute such a contract upon the receipt of certain inputs (e.g., the start of each month or changes in the reference interest rate) may allow parties to the contract to perform their obligations more efficiently. Some smart contracts involve computer code that is embedded on a blockchain distributed ledger—that is, a peer-to-peer database that does not depend on a central authority.[13]

Q.7. Certain factors in contract law such as frustration, duress, undue influence, or misrepresentation need subjective human interpretation of judgement on a case-by-case basis, how is this possible under smart contracts?

A.7. [Jay Sykes, CRS Legislative Attorney, provided this response:]

Because there is not an extensive body of case law applying these doctrines to "smart contracts," it is difficult to state with confidence how they affect such agreements. Nonetheless, a number of commentators have argued that standard defenses to contract formation apply to smart contracts.[14] If a smart contract is embodied in text, courts will likely evaluate that text and the circumstances surrounding the parties' agreement in adjudicating subsequent legal disputes. In contrast, if parties reach an oral understanding that is directly reduced to computer code (a "code-only" smart con-

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[11] Ross Buckley, Dirk Zetzsche, and Douglas Arner, "Regulating Libra", Harvard Law School Forum on Corporate Governance and Financial Regulation, July 10, 2019; Kevin Werbach, "Will Facebook's Libra Change the Way the World Banks?" *Foreign Affairs*, July 29, 2019.

[12] Testimony of David Marcus, Head of Calibra, Facebook, Hearing before the United States Senate Committee on Banking, Housing, and Urban Affairs, July 16, 2019.

[13] See "Smart Contracts and Distributed Ledger—A Legal Perspective", Int'l Swaps and Derivatives Ass'n, Linklaters LLP 4-9 (Aug. 2017), *https://www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf.*

[14] See Jonathan Beckham, Alicia Rosenbaum, and Maria Sendra, "Smart Contracts Lead the Way to Blockchain Implementation", *Thomson Reuters* 3 (Mar. 12, 2018); Max Raskin, "The Law and Legality of Smart Contracts", 1 *Geo. L. Tech. Rev.* 305, 325 (2017).

tract), courts may rely upon the outcomes that the code produces and extrinsic documentary evidence (e.g., email exchanges between the parties) to resolve such disputes.[15]

Q.8. Are there steps Federal regulators can take to protect investors from fraudulent ICOs? What are they?

A.8. Regulators around the world have focused on measures to protect investors participating in initial coin offerings (ICOs), a method of raising capital in exchange for digital coins or tokens that entitle their holders to certain rights. Some countries, including China, Macau, and Pakistan, ban ICOs. In contrast, other countries—including the United States—regulate ICOs under existing securities laws. Securities regulations require that an ICO's promoter register its offering with a regulating agency and disclose certain information about its business. Some countries have developed guidance on the application of securities regulations to various categories of tokens issued pursuant to ICOs, while other countries are applying existing securities regulations to ICOs on a case-by-case basis.

In the United States, ICOs may qualify as securities offerings subject to Federal regulation, depending on their specific features. If policymakers in the United States or other countries are concerned about increasing investor protections, they could consider whether ICOs merit additional licensing and transparency requirements, provide greater clarity regarding which types of ICOs will qualify as securities offerings, and/or focus on increased enforcement efforts and public warnings about the risks of fraudulent ICOs. Additional regulations come with a tradeoff: broader and stronger regulations may deter financial innovation and broader adoption in the cryptocurrency market.

Q.9. Should cryptocurrencies have the same investor protections, the same rules against market manipulation and market fraud? Should they have adequate disclosures and investor protections? The same as bonds and stocks have?

A.9. For investment markets to work efficiently, investors must trust that they have the relevant information necessary to judge the possible risks and rewards of a particular investment. Securities and commodities laws and regulations has been developed overtime in most countries with the aim of ensuring that is the case.

In the United States, market manipulation is prohibited for tradeable securities through the Securities Exchange Act and for commodity futures contracts and commodity spot transactions through the Commodity Exchange Act. According to the Securities and Exchange Commission (SEC), cryptocurrencies offered in an "initial coin offering" (ICO) may, depending on their features, qualify as offerings of "securities" subject to Federal regulation under the Securities Act of 1933 (Securities Act) and the Securities Ex-

[15] See Stuart D. Levi and Alex B. Lipton, "An Introduction to Smart Contracts and Their Potential and Inherent Limitations", *Harv. L. Sch. Forum on Corp. Gov. and Fin. Reg.* (May 26, 2018), *https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/*.

change Act of 1934 (Exchange Act).[16] The Commodity Futures Trading Commission (CFTC) has defined cryptocurrencies as "commodities" which gives them enforcement authority regarding fraud and manipulation of cryptocurrency exchanges.

Despite these laws, concerns about market manipulation on cryptocurrency exchanges persist. Market manipulation is a deliberate attempt to interfere with the free and fair operation of the market and create artificial, false, or misleading appearances with respect to the price of, or market for, a product, security, commodity, or currency. In cryptocurrency exchanges, concerns about market manipulation include, for example:

- *pump-and-dump schemes* (artificially inflating the price of an owned cryptocurrency through false and misleading positive statements, in order to sell the cheaply purchased stock at a higher price);
- *wash trading* (an investor simultaneously sells and buys the cryptocurrencies to create misleading, artificial activity in the marketplace);
- *spoofing* (a trader places a large order to buy or sell a cryptocurrency, with no intention of executing); and
- *front running* (a firm either buys cryptocurrency for itself before filling customer buy orders that drive up the price, or sells cryptocurrency itself before filling customer sell orders that drive down the price).[17]

According to one study, up to 95 percent of all transactions in bitcoin are fraudulent and/or noneconomic in nature.[18]

RESPONSES TO WRITTEN QUESTIONS OF SENATOR CORTEZ MASTO FROM MEHRSA BARADARAN

Q.1. In your paper, you recommend faster payments and an expansion of postal banking. What about enforcing and possibly expanding the Community Reinvestment Act to ensure that residents of rural areas and low-income communities have access to bank accounts that don't charge high fees like $7.00/per ATM transaction or require a minimum balance of $1,500 to open an account or avoid costly fees?

A.1. The CRA must be strengthened, expanded, and enforced. I recently testified in response to this question before the House Subcommittee on Consumer Protection and Financial Institutions about the CRA. The underlying theory of the CRA is that banks have public duties because they are essentially public institutions. In passing the CRA in 1977, Senator William Proxmire, Chairman of the Senate Committee on Banking, Housing, and Urban Affairs alluded to the dependent nature of the bank–State relationship. He stated that the CRA was based on a "widely shared assumption" that "a [bank's] public charter conveys numerous economic benefits

[16] "Initial Coin Offerings", U.S. Securities and Exchange Commission, *https://www.sec.gov/ICO*; Jay Clayton, "Statement on Cryptocurrencies and Initial Coin Offerings", U.S. Securities and Exchange Commission, December 11, 2017.

[17] Nouriel Roubini, "The Great Crypto Heist", *Project Syndicate*, July 16, 2019.

[18] Bitwise Asset Management, Presentation to the U.S. Securities and Exchange Commission, March 19, 2019.

and in return it is legitimate for public policy and regulatory practice to require some public purpose . . . ." The Senator claimed that banks are "a franchise to serve local convenience and needs" and therefore "it is fair for the public to ask something in return."

The CRA is the last remaining tool of regulators to require banks to extend credit beyond their preferred customer base, but banks have resisted engaging in "inefficient" or "unprofitable" transactions. And this is the truth that cannot be avoided—serving the needs of these communities has not be profitable and regulators have not required that they do so. The CRA only requires banks to offer services in their chosen service area. Thus, many banks have decided to close down branches in wide swaths of the country. These areas are essentially CRA deserts as well as bank deserts. If banks are not providing financial services to the poor, and requiring them to do this is ineffective, inefficient, or otherwise politically fraught, then any serious discussion of financial inclusion must consider a public option.

In short, the CRA must be strengthened in ways that recognize the tremendous task it was created to do and remains undone today. Banks are in a unique position to engage in this effort and have historically been tasked with playing a significant role. But a strong CRA should be only one step in an effort to match for the large inequalities in the credit and payments systems.

The full testimony can be found here: *https://financialservices.house.gov/uploadedfiles/hhrg-116-ba15-wstate-baradaranm-20190409-u2.pdf.*

Q.2. What safeguards, if any, are in place to ensure bitcoin or other cryptocurrencies, are not used to finance illegal activity?

A.2. Cryptocurrency exchanges have voluntarily complied with KYC, AML, and CFT regulations—these exchanges are registered companies and thus have regulatory compliance duties. While many people and companies use these exchanges to purchase and sell, there are also decentralized exchanges that operate from one person to another—without an exchange. There are currently no comprehensive safeguards in place to prevent the financing of illegal activities through those transactions. Accordingly, bitcoin and other cryptocurrencies are currently being used to finance illegal activities.

Q.3. In your opinion, what is the best way to crack down on the use of cryptocurrencies to finance illegal transactions dealing with drug and sex trafficking?

A.3. Because I am a banking law expert and not an expert on criminal enforcement, I will narrow my response to what can be done in the banking context. Cryptoexchanges can be regulated to prevent illegal exchange so laws can mandate that all cryptotransactions must go through a sanctioned private exchange. Anyone exchanging cryptocurrencies outside of regulated exchanges would have to be prosecuted, which might prove to be difficult. Whether and how law enforcement might be able to track and prosecute these transactions is outside of my scholarly purview.

Q.4. Should cryptocurrencies have the same investor protections, the same rules against market manipulation and market fraud?

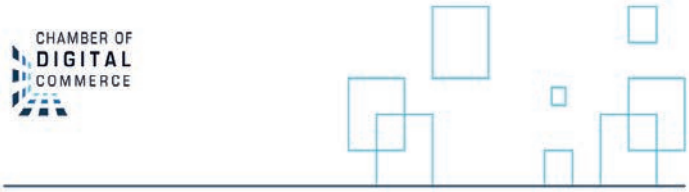
Should they have adequate disclosures and investor protections? The same as bonds and stocks have?

A.4. Yes. Though compliance can be made less costly, these regulations must apply to public investments in order to protect investors and consumers from fraud. The test for whether an investment is a security, according to the Howey case "is the presence of an investment in a common venture premised on a reasonable expectation of profits to be derived from the entrepreneurial or managerial efforts of others." If this applies to an ICO, it should be considered a security. The CFTC has likewise determined that some cryptocurrencies like bitcoin are a commodity and shall be regulated as such.

Technology has and will continue to fundamentally transform finance, but it has not and should not alter safety and soundness, privacy, or consumer protection regulations. Cryptocurrencies are either a store of value, tradable currencies, investments, and a payments system or as some have promised, they are all of these things. There is nothing about all these things being put on the blockchain that makes it any less likely that their founders will engage in fraud, insider trading, or other harms that the SEC and CFTC regimes were created to prevent.

ADDITIONAL MATERIAL SUPPLIED FOR THE RECORD

STATEMENT SUBMITTED BY THE CHAMBER OF DIGITAL COMMERCE



Chamber of Digital Commerce

Testimony for the Record

United States Senate Committee on Banking, Housing, and Community Affairs

Hearing *Examining Regulatory Frameworks for Digital Currency and Blockchain*

July 30, 2019

I. Introduction

The Chamber of Digital Commerce (the "Chamber") welcomes the opportunity to submit this testimony for consideration by the Senate Banking Committee (the "Committee") regarding regulatory frameworks impacting digital currencies and blockchain technology. The Chamber is the world's largest blockchain trade association. Our mission is to promote the acceptance and use of digital assets and blockchain technology, and we are supported by a diverse membership that represents the blockchain industry globally.

Through education, advocacy, and close coordination with policymakers, regulatory agencies, and industry across various jurisdictions, our goal is to develop a pro-growth legal environment that fosters innovation, job creation, and investment. We represent the world's leading innovators, operators, and investors in the blockchain ecosystem, including leading edge start-ups, software companies, global IT consultancies, financial institutions, insurance companies, law firms, and investment firms. Consequently, the Chamber and its members have a significant interest in blockchain and distributed ledger technology.

II. Executive Summary

This testimony describes the principles we believe are important to consider when establishing government priorities for blockchain technology; the importance of terminology; and areas of friction related to financial services that we have identified through our many years of work with the industry. Specifically, this document

addresses:

- The benefits of blockchain as a technology that creates faster, more efficient, more inclusive systems that, if properly overseen, can create extraordinary opportunities for consumers;
- The need for government support from the federal government and Congress (the states are already capitalizing on the opportunity this technology presents) to ensure that technological advances and associated standards and oversight remain in the United States;
- The existing complex regulation of "spot" markets such as trading platforms and exchanges, and potential solutions;
- The need for clear guidance as to when a digital token is a security triggering the U.S. securities laws as well as solutions to certain consumer protection principles within the securities laws;
- The technological advances blockchain technology brings to anti-money laundering and economic sanctions compliance, and how existing laws inhibit enhanced detection;
- How misunderstandings around what is a "smart contract" are creating a patchwork of inconsistent legislation in the states;
- The lack of accounting standards specific to digital assets such as virtual currencies is limiting the ability of companies to deliver better transparency and obtain necessary regulatory approvals; and
- The current tax treatment that has been criticized broadly due to needed clarification in a number of areas; it is also inhibiting use of virtual currencies as a method of payment.

We thank the Committee for its interest in this important matter and look forward to continued engagement.

III. The Benefits of Blockchain Technology and DLT

Distributed ledger technology is computer software that employs a shared database architecture to maintain multiple, identical copies of an auditable, up-to-date distributed digital record of transactions or data. A blockchain is a specific type of DLT that records transfers of data and organizes them into "blocks" that are stacked or "chained" together chronologically by a cryptographic hash function and confirmed by a consensus mechanism. Advanced blockchains can serve as the foundational protocol upon which many applications can be built - much like how the Internet underpins multiple applications such as e-mail, e-commerce, and business processes.

Characteristics of Blockchain Technology:

- Distributed: Data is shared across nodes rather than being maintained by a central administrator. Each node maintains a copy of the blockchain, making it resilient to localized failures and isolated attacks.

- Consensus Algorithm: A set of rules by which a distributed network reaches agreement to verify a transaction's occurrence and ensures that all nodes have an identical copy of the ledger of transactions.

- Cryptography: Blockchains use complex mathematical algorithms to secure and validate transactions on the network.

- Immutability and Record Keeping: Once a transaction occurs and is recorded on a blockchain, the hashing and linking functions provide authenticity by showing that items have not been altered.

- Smart Contracts: The ability to link and execute automated smart contracts increases the efficiency of transactions.

Bitcoin was the first iteration of blockchain technology. Bitcoin provided a solution to the operative problems of transferring value in a digital environment – specifically, how to ensure that digital value is not spent twice. Although the solution was beneficial to the promulgation of virtual currencies, its underlying value is in its potential to create transactional efficiencies in transferring value and recording transactions in a secure way in a vast array of industries. This is due, in part, to the manner in which cryptographically-protected information is replicated, shared, and accessed across a network.

At its heart, blockchain is a database technology. As with any database technology, it can be used to create and track digital representations of assets (including natively digital goods). The financial services applications of blockchain include value transfer and the creation of digital tokens[1] representing traditional securities and other traditional financial instruments. It would be too limiting, however, to only consider these applications of the technology and any consideration of blockchain technology must recognize the broad array of uses for tokens as well as assets that can be digitized and transacted in on blockchains, including tangible assets. Simply creating a digital representation of an asset does not change the asset's character or nature, nor should it change the asset's treatment under law.

For more information and detail regarding blockchain technology and legislative solutions, see *Legislators' Toolkit for Blockchain* at https://digitalchamber.org/state-legislators-toolkit/.

[1] Digital tokens are transferable units generated within a distributed network that tracks ownership of the units through the application of blockchain technology. CHAMBER OF DIG. COMMERCE, Understanding Digital Tokens: Market Overviews and Proposed Guidelines for Policymakers and Practitioners, https://digitalchamber.org/token-alliance-whitepaper/.

IV. Areas in Need of Consideration

The following are areas within the financial services sector that we have identified as requiring attention and/or clarification from government actors to ensure that blockchain technology and DLT can thrive to provide improved products and services to consumers in the United States in a responsible way.

a. Decisive Government Support

The possibilities provided by blockchain technology and its tremendous positive impact for economic advancement have been recognized by policymakers on the federal, state, and multinational levels. Its ability to improve business processes, increase efficiency, and promote transparency in numerous industries is transforming the ways in which companies conduct business and transact. Blockchain is a revolutionary breakthrough, allowing us to create infrastructure towards an "Internet of Value" whereby value can be exchanged as quickly as information.

While technological progress is clear, it does not automatically follow that the United States will establish its preeminence in the blockchain sector. Already, major industrialized nations are making significant advances in promoting and adopting this technology, making a hard run to be the leaders, and obtain the economic benefits, of this industry. If the United States fails to address the outstanding regulatory issues, it risks falling significantly behind other nations who recognize the advantages blockchain brings.

Government agencies within the United States are exploring blockchain technology to streamline federal procurement, for example, and U.S. companies are building systems to streamline operating practices, capture economic efficiencies, and grow the U.S. economy.[2] More needs to be done, however, to coordinate support for this technology in the United States. Laws dating back decades, in some cases 80 years, are proving difficult to apply to this emerging technology and are thus stifling economic growth in this space.

In the twentieth century, the U.S. government realized the tremendous potential of the Internet and took a central role in nourishing, developing, and promoting its creation and widespread adoption. To maintain our technological and economic world leadership, it is imperative that the United States similarly encourage blockchain development or risk falling behind countries that are embracing the technology and exploring its benefits in

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[2] *See, e.g.*, DEP'T OF HOMELAND SEC., BLOCKCHAIN AND SUITABILITY FOR GOVERNMENT APPLICATIONS (2018), https://www.dhs.gov/sites/default/files/publications/2018_AEP_Blockchain_and_Suitability_for_Government_Applications.pdf; *see also* Steve Delahunty, *Developments and Adoption of Blockchain In the U.S. Federal Government* (Jan. 25, 2018), https://www.forbes.com/sites/forbestechcouncil/2018/01/25/developments-and-adoption-of-blockchain-in-the-u-s-federal-government/#3fb7781d3d99.

the private and public sectors. To meet this need, we proposed a National Action Plan for Blockchain to ensure that blockchain technology is encouraged and supported in the United States.[3]

The United States needs two things to remain at the forefront of blockchain developments and promote its innovation and use: 1) provide leadership through strong public support and policymakers who are open to and understand the technology; and 2) a coordinated plan to ensure appropriate support and harmonized regulatory approach, where needed.

The U.S. government must explore these opportunities in depth through many means, including conversations with industry leaders and government stakeholders to ensure the United States maintains its competitive advantage in technological development. This engagement could occur through an intergovernmental taskforce, or a regular meetings between the public and private sectors, to discuss the benefits of blockchain technology across industries. An intergovernmental task force will serve to further the U.S. position to promote free enterprise and to develop policy objectives toward promoting industry-led blockchain and economic growth within the United States. This collaboration can also be used to help public officials and regulators remain knowledgeable and informed about the technology.

A cornerstone of any blockchain initiative requires the exploration and understanding of blockchain and DLT. These technologies are often complex and must be properly understood and tested before implementation. We therefore recommend that one result of the Committee's efforts should be to establish an office, or task an existing office, within the Executive branch that coordinates the U.S. Government's blockchain strategy going forward. This office would serve to coordinate agency consideration of blockchain, determine and promote government applications of blockchain that could cut costs for taxpayers, track the government's use of blockchain across agencies, and act as a gateway for industry and government to best understand the laws surrounding blockchain and virtual currencies.[4] Such an office can better develop blockchain-based economic development and activity and coordinate the U.S. government's perspective across agencies. In addition, accelerated government adoption and use, where appropriate, will help the public sector by providing a reference of working examples and best practice implementations. We note that this office would not just consider financial services applications, but all applications that could benefit government, industry, and consumers.

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[3] CHAMBER OF DIG. COMMERCE, NATIONAL ACTION PLAN FOR BLOCKCHAIN (Feb. 20 2019), https://digitalchamber.org/blockchain-national-action-plan/.

[4] Several U.S. states have already adopted this approach, as recommended in our Legislator's Toolkit for Blockchain, or developed blockchain task forces or initiatives, including Delaware, Florida, Illinois, New York, North Carolina, Wyoming, and at least 14 states have introduced legislation to do the same.

b. Existing Regulation of Spot Markets (Trading Platforms and Exchanges)

The Commodity Futures Trading Commission ("CFTC") has regulatory and enforcement jurisdiction over derivatives of virtual currencies traded in the United States. While it does not have direct oversight jurisdiction over markets or platforms conducting cash or "spot" transactions in virtual currencies, it does maintain after-the-fact enforcement against fraud and manipulation in those spot markets.[5]

Primary oversight of virtual currency spot market activity – including wallet providers, which are used to store, send, and receive virtual currency, and exchanges – primarily falls under state money transmission laws and federal anti-money laundering ("AML") oversight and enforcement. Currently, 49 states, the District of Columbia, and various U.S. territories each have their own money transmission license requirements,[6] many of which apply to virtual currency-related businesses. Oftentimes, however, it is unclear which or how those requirements apply. Companies are thus subject to significant uncertainty and onerous state-by-state application requirements, fees, examinations, and regulatory oversight in a system that was designed for 20th century business models and services. The various state laws differ in meaningful ways, even on things as fundamental as the definition of a money transmitter, which determines whether companies must file an application and obtain a license.[7]

In addition to state licensing requirements, these companies must also register with the Financial Crimes Enforcement Network ("FinCEN") of the Department of the Treasury as money services businesses ("MSBs") and comply with various federal regulations including recordkeeping, reporting, and development of an anti-money laundering ("AML") program and other requirements.

This patchwork of state and federal regulations is expensive, requiring dedicated personnel to manage the recordkeeping alone, in addition for personnel to maintain AML program compliance obligations and manage each state's and the federal government's on-site examinations, among other things. For blockchain companies, many of which are growing start-ups with seasoned industry executives, this antiquated

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[5] *Virtual Currencies: The Oversight Role of the U.S. Securities and Exchange Commission and the U.S. Commodity Futures Trading Commission Before the Comm. on Banking, Housing, and Urban Affairs*, 115th Cong. 4 (2018) (statement of J. Christopher Giancarlo, Chairman, Commodity Futures Trading Comm'n). *See also* National Futures Association, Interpretive Notice 9073 – Disclosure Requirements for NFA Members Engaging in Virtual Currency Activities (May 17, 2018), https://www.nfa.futures.org/rulebook/rules.aspx?Section=9&RuleID=9073.

[6] CONFERENCE OF STATE BANK SUPERVISORS, 2017 NMLS MONEY SERVICES BUSINESSES INDUSTRY REPORT (Sept. 2018), https://mortgage.nationwidelicensingsystem.org/about/Reports/2017-NMLS-Money-Services-Businesses-Report.pdf; *see also* Thomas Brown, *50-STATE SURVEY: Money Transmitter Licensing Requirements*, CALIFORNIA ASSEMBLY, https://abnk.assembly.ca.gov/sites/abnk.assembly.ca.gov/files/50%20State%20Survey%20-%20MTL%20Licensing%20Requirements(72986803_4).pdf (last visited February 28, 2019).

[7] CONFERENCE OF STATE BANK SUPERVISORS, *supra* note 12.

and inconsistent framework poses a high barrier to entry. The current framework and laws were designed prior to the digital era and are not well-suited for digital companies whose business and service models are inherently global in nature and may not fit the traditional descriptions of "money transmitters." This regulatory regime prevents the introduction of new technologies to advance financial inclusion and the provision of financial services, which blockchain companies enable.

State licensing requirements are primarily focused on consumer protection, the management of the company via background checks and other criteria, and the solvency of the money transmitter as a custodian of customers' funds. Placing virtual currency and blockchain companies under this regulatory framework is inefficient because it does not take into account broader market oversight including price and market manipulation. This inefficiency may undermine the goals of consumer protection[8] and fair and efficient markets. Indeed, both Chairman Clayton of the Securities and Exchange Commission ("SEC") and Chairman Giancarlo of the CFTC have noted that it may be time to re-evaluate this framework.[9]

In addition, the SEC has jurisdiction over exchanges that offer and sell securities. According to the SEC, "A platform that offers trading in digital asset securities and operates as an "exchange" (as defined by the federal securities laws) must register with the Commission as a national securities exchange or be exempt from registration."[10] A question arises, however, as to when an exchange is selling a digital token that is not a security, and one that is.

The CFTC, FinCEN, SEC, state regulators, and other regulatory bodies all have jurisdiction to oversee various aspects of virtual currency markets. The Chamber believes that there should be a single federal option alternative that recognizes the unique attributes of blockchain technology and digital assets and that pre-empts state money transmitter licensing requirements to avoid duplicative and inefficient regulation. Alternatively, the development of an industry-developed and led self-regulatory organization, empowered by Congress through legislation providing it with enforcement powers, could be an effective vehicle for governance. Either of these options requires a careful balancing of the factors required to achieve meaningful oversight, appropriate sanctions on violators, and encourage robust economic development.

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[8] SEC Strategic Hub for Innovation and Financial Technology, *Framework for "Investment Contract" Analysis of Digital Assets*, April 3, 2019, https://www.sec.gov/corpfin/framework-investment-contract-analysis-digital-assets.

[9] Jay Clayton and J. Christopher Giancarlo, *Regulators are Looking at Cryptocurrencies*, WALL ST. JOURNAL (Jan. 24, 2018), https://www.wsj.com/articles/regulators-are-looking-at-cryptocurrency-1516836363 ("We would support policy efforts to revisit these frameworks and ensure they are effective and efficient for the digital era.").

[10] SEC Division of Corporation Finance, Division of Investment Management, and Division of Trading and Markets, Statement on Digital Asset Securities Issuance and Trading (Nov. 16, 2018), https://www.sec.gov/news/public-statement/digital-asset-securites-issuuance-and-trading.

c. The Need for Guidance on Digital Tokens

Many participants in the blockchain industry have developed tokens to enable use of their systems or relied on token sales to fund the development or operation of their blockchain projects. Some of these tokens are widely understood not to be securities under federal securities laws, as is the case with bitcoin and ether. In other instances, however, if the token or method of distribution meet certain criteria, the SEC has found certain tokens to be securities and brought enforcement actions against issuers for violation of securities laws.

The SEC uses the *Howey* Test derived from a U.S. Supreme Court case dating back to 1946 to determine whether an investment contract such as a token is a security.[11] The *Howey* Test dates back almost seventy-five years and was not created with the digital age in mind. While the SEC commissioners and staff have made attempts through speeches, testimony, enforcement actions, and other means to signal to market participants what characteristics of a token might make it a security, such guidance is not binding on future agency action. The recent publication of a Framework for "Investment Contract" Analysis of Digital Assets is a helpful checklist for companies to consider in this regard; however, its numerous criteria, without reference to which carry more weight than others if triggered, render the guidance difficult for practitioners to use with confidence. Unfortunately, the No Action Letter published contemporaneously with the Framework was very limited and, arguably, the digital token should not have been considered a security at all.

Innovators need formal guidance, developed with industry input and an understanding of the various token platforms and uses, on the standards and factors that the SEC believes are appropriate for the evaluation of whether a digital token constitutes a security, as well as clear statements that bitcoin, ether, XRP, and similar tokens are not considered, in and of themselves, to be securities. Currently, determinations are made on a case-by-case basis and, for a single token, may change over time as the characteristics of the token change. The lack of clarity around the standards used to determine what constitutes a security is inhibiting development and innovation in the industry and is resulting in the United States falling behind other nations with clearer token guidelines that foster innovation.[12]

In order to provide the certainty companies need to operate in the United States, a digital token definition needs to be established that clearly outlines the criteria for such a token to be deemed a security. Further, certain digital tokens must be explicitly carved

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[11] *SEC v. W.J. Howey Co.*, 328 U.S. 293 (1946); *see* Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO (July 25, 2017), https://www.sec.gov/litigation/investreport/34-81207.pdf.

[12] *See, e.g.*, Leigh Cuen, *Circle Moves Exchange Operations Offshore With New Bermuda Office*, CoinDesk, (July 22, 2019), https://www.coindesk.com/circle-moves-non-us-poloniex-customers-to-new-bermuda-entity.

out from consideration of a security under securities law. The new definition should include "utility" or use-based tokens that serve a fundamental purpose – as an integral part of a service offering – and, accordingly, should not be considered an investment contract under the *Howey* Test.[13] Many utility token distributions are vital to projects where companies are attempting to create innovative solutions using blockchain, but their fundamental existence is jeopardized by the existing regulatory uncertainty. Creating a clear definition and space for these tokens to exist would not only benefit U.S. innovation, but would serve a dual purpose to address fraudulent activities.

One way to achieve this clarity is through legislation that would spell out these criteria and amend the securities laws as appropriate, and this route may be necessary. Moreover, the SEC should consider a clearly articulated safe harbor or other exemptive relief concluding that certain digital tokens are not securities. For example, a clear binding statement that bitcoin, ether, and XRP are not securities would go a long way to enabling certain facets of the industry to evolve.

d. Needed Clarifications Concerning Custody of Digital Tokens

With digital tokens, there is no object stored physically; rather records are maintained on an immutable blockchain showing transactions and transfers of ownership that have occurred by sending and receiving tokens via a software wallet using public-private key encryption. The technologies and methods used to maintain ownership and to safeguard these assets are constantly evolving. For example, the application of multi-signature[14] technology bringing added consumer protections to authentic transactions; however, they also bring a layer of complexity to custody requirements for these assets because the keys necessary to execute a transaction may be in multiple physical locations. Public and private keys are analogous to a user name and password where the public key, like a user name, may be viewed by anyone and the private key, like a password, is stored privately and used in conjunction with the public key to access the software. Regulators and policymakers will need to understand the ways in which ownership of these new assets is currently reflected and be mindful of the evolution of the technologies as they consider guidance to market participants on the application of existing regulatory requirements surrounding custody[15] to innovative technologies.

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[13] For more information on "utility tokens," *see* Understanding Digital Tokens: Market Overviews and Proposed Guidelines for Policymakers and Practitioners, https://digitalchamber.org/token-alliance-whitepaper/.

[14] Multisignature, or "multisig" refers to a cryptographic functionality within public key infrastructure that requires more than one private key to complete a transaction. Many companies offer multisig wallets, where, for example, a 2-of-3 multisig wallet would require 2 out of 3 private keys, usually held separately, in order to authorize a transaction.

[15] *See* Reserves and Custody of Securities, 17 C.F.R. § 240.15c3-3 (2018); *see also* Custody of Funds or Securities of Clients by Investment Advisors, 17 C.F.R. § 275.206(4)-2 (2018); *and see also* SEC Division of Trading and Markets and FINRA Office of General Counsel, Joint Staff Statement on Broker-Dealer Custody of Digital Asset Securities (July 8, 2019), https://www.sec.gov/news/public-statement/joint-staff-statement-broker-dealer-custody-digital-asset-securities.

This changing technology is moving faster than regulatory infrastructure and decision-making. Regulated broker dealers and investment advisers, lawyers, independent auditors, and others have spent countless hours at a significant cumulative cost to try to fit rules written for physical and book-entry securities to the blockchain environment. Nevertheless, the market needs more definitive guidance for participants to move forward in light of regulatory and litigation risk.

Any possession or control standards for digital assets need to take into account the technological reality of how these assets are managed, and satisfactory control should focus, for example, on whether the digital asset is properly cryptographically protected and that adequate cybersecurity practices, specific to DLT, are maintained. As the Committee (and the SEC) continues to think through these issues, the Chamber encourages it to be open-minded as to what can constitute possession or control, and for the government to foster a pro-growth environment when interpreting these and other issues that arise as blockchain technology develops.

e. Enhancement of Anti-money Laundering and Sanctions Compliance

Blockchains provide unprecedented ability to track and trace transactions historically, both by token and by wallet/account. Chamber members Chainalysis and CipherTrace are performing cutting-edge analytics with blockchain technology and helping governments and businesses (including financial institutions) to identify and mitigate risk and enable companies to alert law enforcement. Unlike cross-border wire transfers, blockchains perfectly preserve the provenance of financial transactions and do not suffer from data integrity issues.

Additionally, the Blockchain Alliance, co-founded by the Chamber of Digital Commerce in 2015, is an important medium for sharing information and education between the public and private sector to support law enforcement objectives. With more than 100 members, it continues to serve an important function. Lawmakers should take note of the proactive work being done by this industry to ensure that law enforcement is knowledgeable about the industry and the technology, and that it can achieve its objectives, thus creating an orderly functioning of the marketplace. This work is being utilized by multiple agencies within the government but can be further enhanced to reach and assist more participants.

The ability to trace transactions back through time is a technological advancement and has already provided a boon to law enforcement and its efforts to detect and prosecute criminals. Specifially with respect to Bank Secrecy Act ("BSA") and Office of Foreign Assets Control ("OFAC") compliance obligations, it can support Know Your Customer ("KYC") management in ways that ensure the characteristics of the customer, including beneficial ownership, are well-established on a blockchain. Further, blockchain-enabled KYC, customer due diligence ("CDD"), and transaction monitoring can enhance the

Section 314 process – both under Section 314(a)[16] as well as 314(b)[17] (communications between institutions and law enforcement as well as among institutions, respectively) to ensure accurate, comprehensive data. It can also strengthen (real time) auditability of financial transactions between counterparties; facilitate lookbacks given the transparency and immutability of the ledger; and facilitate practical, technology-enabled KYC/CDD efforts, ongoing transaction monitoring, transaction tracking, and auditability/reporting.

Prudential regulators will need to develop publicly available guidance, with industry input, that permits financial institutions to adequately understand first, how they can interact with digital assets and, second, how to understand their customer and the associated transaction that is not so prohibitive that it requires forensics for transactions involving virtual currency that exceed current expectations involving fiat currency transactions and other financial instruments.

FinCEN and the prudential financial regulators will need to consider how to apply these AML and associated KYC requirements to regulated financial institutions engaging in virtual currency-related activities, and the Chamber urges them to engage with market participants in doing so.

A second area to be considered relates to sanctions compliance. The OFAC designation of two Iran-based individuals and their associated Bitcoin addresses raises a similar question in the context of OFAC sanctions.[18] Sanctions obligations are imposed more broadly than traditional notions of AML because they prohibit transactions or dealings in all property or "interests in" property of a designated person. It is through this extensive authority that OFAC has made clear that U.S. persons cannot transact or deal in the Venezuelan petro.[19]

However, the new guidance with respect to blocking property needs further consideration. For example, if a transaction involving a virtual currency indicates in its transaction history that the specific asset at one point in the past was held by a prohibited Iranian entity (or wallet), must that financial institution block the current transaction? Arguably they should not; however, businesses tend to (and should) take a very cautious approach when it comes to sanctions compliance. This approach, not possible with fiat currency because fiat cannot be traced as directly as some virtual

[16] 31 C.F.R. § 1010.520.
[17] 31 C.F.R. § 1010.540.
[18] Press Release, Treasury Designates Iran-Based Financial Facilitators of Malicious Cyber Activity and for the First Time Identifies Associated Digital Currency Addresses (Nov. 28, 2018), https://home.treasury.gov/news/press-releases/sm556.
[19] Exec.Order No. 13,827, 83 Fed. Reg. 12,469 (Mar. 21, 2018).

currencies, nevertheless could restrict adoption of these product/service offerings by financial institutions. This and other consequences of OFAC's recent guidance need to be further explored to prevent unintended consequences in a digital environment.

The standards determined around these issues will have a large impact on fungibility in the token market, and ultimately the widespread adoption of tokens as a means of exchange or evidence of value or ownership. The Chamber and the government alike share the goal of preventing illicit finance and bad actors from accessing the financial system. We should strive to achieve these goals in a manner that does not impede the market's development or disincentivize the use of digital tokens and doing this requires industry and regulator cooperation. The Chamber recommends a forum like the Bank Secrecy Act Advisory Group (BSAAG) or similar arrangement to enable a thorough discussion and consideration of these issues.

Finally, technological developments have rendered traditional notions of KYC obsolete and ineffective. These developments can enable the creation of a digital KYC utility that would serve to verify identity of customers across financial institutions, rather than the current approach requiring financial institutions to obtain and verify the name, date of birth, physical address, and telephone number before onboarding a client. For many, these data points no longer authenticate that a customer is who they say they are. A KYC utility could greatly enhance compliance by financial institutions and permit them to elevate more swiftly potential indicia of fraudulent behaviors. As a result, we recommend permitting such a solution, which could require modification to current agency guidance.

f. Multiple State Statutes Addressing Smart Contracts

"Smart contracts" are computer code programmed to execute transactions based on pre-defined conditions that are particularly innovative when used in conjunction with blockchain technology. These can be simple, automated bill pay arrangements, for example, or much more complex transfer systems.[20] The Chamber promotes the use of smart contracts in conjunction with blockchain technology.

Unfortunately, the term "smart contracts" has created confusion as to whether they are in fact "legal contracts" valid under existing legal principles. The answer to this is clear - existing U.S. law, without further revision, supports the formation and enforceability of smart contracts under state law. The Electronic Signatures in Global and National Commerce Act ("ESIGN Act") and the Uniform Electronic Transactions Act ("UETA") provide sufficient legal basis for smart contracts executing terms of a legal contract.

Nevertheless, we are aware of at least nine states that have amended their electronic

[20] *See, e.g., Legal Guidelines for Smart Derivatives Contracts: Introduction*, INT'L SWAPS AND DERIVATIVES ASS'N (Jan. 2019), https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf.

transaction statutes to specifically recognize "blockchain" and "smart contracts" in this context and four more have introduced legislation attempting to do so. While the Chamber greatly appreciates their pro-active work in promoting blockchain technology, it has unfortunately resulted in multiple states with differing definitions of these terms and different operative language, forming the beginning of a state-by-state patchwork of laws and creating compliance hurdles and confusion for U.S. companies, especially those involved in interstate or global transactions or operations. Additional state legislation, inconsistently drafted, will continue to confuse the marketplace and potentially hinder innovation.[21]

The Chamber recommends establishing a roundtable or briefing on this issue with legal and industry practitioners to fully vet the concerns and legal frameworks to confirm that smart contracts can be valid contracts under existing law and avoid the creation of a state-by-state patchwork of inconsistent laws.

g. Need for Accounting Standards

Currently, no authoritative literature exists under accounting principles generally accepted in the United States ("U.S. GAAP") or International Financial Reporting Standards ("IFRS") that specifically addresses accounting treatment for digital assets, including virtual currencies. Although use and acceptance of virtual currencies as a method of payment are not yet widespread globally, the increasing volume of transactions using virtual currencies necessitates the development of accounting guidance addressing the recognition, measurement, presentation, valuation, and disclosure of virtual currencies and related transactions.

Given this lack of clear guidance on accounting standards for virtual currencies, companies have developed a diversity of views on the appropriate accounting treatment. The absence of accounting standards for virtual currencies is a critical issue for companies seeking to invest and innovate in this technology frontier and may hold back economic growth in the United States. The Chamber, therefore, has formally requested that the Financial Accounting Standards Board ("FASB") to consider adding to its standard setting agenda a project to address accounting standards for virtual currencies[22] and we have encouraged the adoption of appropriate International

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[21] *See also, Guidance Note Regarding the Relation Between the Uniform Electronic Transactions Act and Federal ESIGN Act, Blockchain Technology and 'Smart Contracts'*, UNIF. LAW COMM'N (Mar. 11, 2019), https://www.uniformlaws.org/viewdocument/guidance-note-regarding-the-relatio?CommunityKey=2c04b76c-2b7d-4399-977e-d5876ba7e034&tab=librarydocuments. The Guidance Note provides an overview of the state UETA and federal ESIGN Act regarding blockchain-based smart contracts, concluding that state UETA provisions do not require amendment to enable use of blockchain and smart contracts in electronic transactions and may be detrimental.

[22] *Agenda Request – Determining the Appropriate Recognition, Measurement, Presentation, and Disclosure for Digital Currencies and Related Transactions*, CHAMBER OF DIG. COMMERCE (June 8, 2017), https://digitalchamber.org/wp-content/uploads/2016/12/Digital-Currency-Agenda-Request_6.7.pdf.

Financial Reporting Standards ("IFRS").[23] That process remains ongoing.

h. Existing Tax Guidance Requires Additional Clarification and Consideration

In 2014, the Internal Revenue Service ("IRS") issued Notice 2014-21 that addressed the tax treatment of "convertible virtual currency" for U.S. tax purposes, finding that convertible virtual currency should be treated as property, not currency.[24] As property, a consumer will realize gain or loss upon a sale or exchange of virtual currency. This means that if a taxpayer uses virtual currency to buy a good or service, such as a cup of coffee, s/he would recognize gain or loss on the use of the virtual currency at that time and must track the original basis (cost) of the virtual currency used for the purchase as well as the ultimate purchase price. The Notice also confirmed that payments made using virtual currency are subject to certain information reporting requirements. For example, if an employee is paid in virtual currency, that amount would have to be reported on the employee's Form W-2.

Despite receiving comments and an acknowledged need for additional guidance on its treatment of virtual currencies, the IRS has issued nothing further since 2014 – a situation criticized by the Treasury Inspector General for Tax Administration in a detailed 2016 report.[25] Surprisingly, without issuing further guidance for taxpayers to properly comply, the IRS announced it is now engaging in the beginnings of enforcement actions against over 10,000 taxpayers for failure to follow unclear guidance.[26] Typically agencies are encouraged to issue clear guidance so that affected persons can comply before engaging in enforcement – especially on such a widespread scale.

Comprehensive guidance addressing the tax treatment of virtual currencies and digital securities tokens is sorely needed. This guidance should consider the use of virtual currencies as both a payment mechanism and an investment asset class and should further take into account the rapidly evolving nature of the technology so as not to need frequent re-visiting as the technologies continue to develop. Moreover, the agency

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[23] Comments to the IFRS Interpretation Committee Re: Tentative Agenda Decision – Holdings of Cryptocurrencies, CHAMBER OF DIG. COMMERCE (May 15, 2019), http://eifrs.ifrs.org/eifrs/comment_letters/528/528_25561_PaulBrignerChamberofDigitalCommerce_0_ChamberofDigitalCommercelettertoIFRSTADonHoldingsofCryptocurrencies.pdf.

[24] Press Release, Internal Revenue Serv., IRS Virtual Currency Guidance: Virtual Currency Is Treated as Property for U.S. Federal Tax Purposes; General Rules for Property Transactions Apply (Mar. 25, 2014), https://www.irs.gov/newsroom/irs-virtual-currency- guidance.

[25] Press Release, Treasury Inspector Gen. for Tax Admin., Rising Use of Virtual Currencies Requires IRS to Take Additional Steps to Ensure Taxpayer Compliance (Nov. 8, 2016), https://www.treasury.gov/tigta/press/press_tigta-2016-34.htm.

[26] See Internal Revenue Service, *IRS Has Begun Sending Letters to Virtual Currency Owners Advising Them to Pay Back Taxes, File Amended Returns; Part of Agency's Larger Efforts*, July 26, 2019, https://www.irs.gov/newsroom/irs-has-begun-sending-letters-to-virtual-currency-owners-advising-them-to-pay-back-taxes-file-amended-returns-part-of-agencys-larger-efforts.

should acknowledge that virtual currencies can also be used as a form of payment and, as such, should not incur capital gain/loss treatment and thereby trigger income tax in those circumstances.

V. Conclusion

The Chamber appreciates the consideration of the Committee regarding key financial services principles and areas of friction highlighted in this letter. Ultimately, the U.S. government must publicly recognize the importance of blockchain and establish a framework for enabling and promoting its development. Without this, the United States will not achieve its full benefits and will fall behind other countries who are recognizing this extraordinary opportunity to become a leader in this technology. Through the Chamber's work,[27] we are engaging with stakeholders to address these matters and are pleased to serve as a continued resource.

* * *

[27] A list of our initiatives and working groups is available online, https://digitalchamber.org/initiatives/.

LETTER SUBMITTED BY THE NATIONAL ASSOCIATION OF FEDERALLY-INSURED CREDIT UNIONS

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July 29, 2019

The Honorable Michael Crapo
Chairman
Committee on Banking, Housing
& Urban Affairs
United States Senate
Washington, DC 20510

The Honorable Sherrod Brown
Ranking Member
Committee on Banking, Housing
& Urban Affairs
United States Senate
Washington, DC 20510

Re: Tomorrow's Hearing, "Examining Regulatory Frameworks for Digital Currencies and Blockchain"

Dear Chairman Crapo and Ranking Member Brown:

I write to you today on behalf of the National Association of Federally-Insured Credit Unions (NAFCU) ahead of tomorrow's hearing on "Examining Regulatory Frameworks for Digital Currencies and Blockchain" to thank you for examining this important area. NAFCU advocates for all federally-insured not-for-profit credit unions that, in turn, serve over 117 million consumers with personal and small business financial service products.

NAFCU is supportive of innovation in the marketplace that maintains an inclusive, safe, and strong financial system. Such innovation can present opportunities for credit unions, but it must also be appropriately regulated in areas ranging from the *Bank Secrecy Act* and Anti-Money Laundering to data security. As we have learned from recent data breaches, companies that specialize in lending, payments, or data aggregation are a target for hackers and present data protection concerns. While depository institutions have for decades complied with a national standard on data security since the passage of the *Gramm-Leach-Bliley Act*, other entities that handle consumer financial data do not have such a mandated standard. Congress and regulators must ensure that when companies offering digital currencies compete with financial institutions, they do so on a level playing field where tested regulations and consumer protections apply to all actors. It is clear that digital assets can pose unique risks in certain contexts and regulators must be equipped, with suitable Congressional oversight, to provide supervision over these markets to protect consumers and our economy.

Thank you for your attention to this issue, and we stand ready to work with the Committee as you continue to examine this important topic. Should you have any questions or require any additional information, please contact me at mvirkus@nafcu.org or 703-842-2261.

Sincerely,

Max Virkus
Associate Director, Legislative Affairs

cc: Members of the Senate Banking Committee

"GO SLOW ON LIBRA. SPEED UP ON FASTER PAYMENTS", BY JENNIFER TESCHER, FORBES

1,620 views | Jul 17, 2019, 1:45 pm

Go Slow On Libra. Speed Up On Faster Payments.

Jennifer Tescher Contributor

Fintech

I write about fintech, financial health and innovation.

Given that there are currently no rules or roadmaps for regulating payments outside of banks, as Facebook is proposing, it is easy to understand why the Fed wants to take its time in understanding the ramifications. Faster payments, on the other hand, are no longer out of the ordinary. Photographer: Chris Ratcliffe/Bloomberg © 2015 BLOOMBERG FINANCE LP

Libra, the new Facebook-led effort to create a real-time, blockchain-based payments system, has received a cool reception from pundits, politicians, and even some of its own partners since its unveiling last month. Now, the verdict that matters the most is in: Federal Reserve Chairman Jerome Powell told Congress that Libra "raises serious concerns" and "cannot go forward" without further study from a new task force and regulator support.

We all know that could take a while. So, in the meantime, here's a suggestion: Powell should pull the trigger and instruct the Fed to deliver on faster payments.

The irony is, the lack of a ubiquitous real-time payments system in the United States is one of

slow payments infrastructure exacerbates the financial challenges of those living paycheck to paycheck. That's a problem the Fed can solve now.

Most people reading this column are generally immune to worrying about when the check they deposit today will be available to spend. But with nearly half of workers earning $15/hour or less, and 39% of Americans challenged to come up with $400 in an emergency, the one- to three-day gap between payday and when the money is actually available creates stress, drives up fees, and leads to increased credit usage for day-to-day expenses.

Checks aren't the only problematic form of payment. Debit cards, which are disproportionately used by lower-income households, create similar lags between purchase and settlement. Even electronic transfers from one bank to another can take days.

These cash flow gaps are one of the reasons more than a third of people say they can't pay all their bills on time, an important indicator of financial health. A worker who is paid on a Thursday and has a bill due on a Friday runs the risk of incurring a late fee from the biller, or getting charged an overdraft fee from her bank, or both. If you've ever wondered why people would pay a fee to cash a check, this timing gap is one of the main culprits. Other people use credit cards to bridge the gap and, when the card is maxed out, some turn to payday loans.

The ultimate irony is that overdraft was originally created as a service to help customers avoid bounced checks due to timing gaps. Today, debit card transactions generate most of the overdrafts largely because of timing errors, generating as much as $8 billion a year in penalty fees. While it's impossible to know just what share of check-cashing fees, payday loans and overdrafts are a direct result of our outdated payments system, Aaron Klein at the Brookings Institution estimates that eliminating just 10 percent of these fees would amount to $3.5 billion a year back in the pockets of working families.

The Federal Reserve understands this. It created the Faster Payments Task Force seven years ago to develop a plan for giving anyone with a bank account the ability to receive real-time payments by the year 2020. More than 300 task force members spent an estimated 120,000 hours participating in 252 meetings and teleconferences. Yet here we are, less than six months from the pronounced finish line, and it still takes longer for a check from California to clear in Florida than it does to send a payment between the United Kingdom and France. (Most of the rest of the world doesn't even have checks anymore, but that's another story.)

The UK adopted faster payments over a decade ago. Australia and Hong Kong brought real-

House, which is co-owned by the country's biggest banks, launched Real-Time Payments in late 2017. TCH says that, today, the network is connected to half of all bank accounts, although for most of us, the only time we experience it is if we send money to a friend through the Zelle person-to-person digital payments service. Zelle is offered through Early Warning Services, also owned by a consortium of the largest U.S. banks.

And therein lies the problem: As long as the only real-time U.S. payments networks and products are owned by the country's largest banks, those banks get to decide when and how to deploy them. The cash flow of the nation is simply too important to outsource.

The ability to move money safely, securely, cheaply and quickly is of vital national importance. It touches everyone and every part of our economy. It should be considered a critical component of our national infrastructure, just as cash is today, and deployed in the broad public interest.

That's not to say it should be the only option. Private companies and organizations – be it TCH, Facebook, or others – should have every opportunity to compete. In fact, the Fed should be positively predisposed to private-sector payments innovation, even in the case of a blockchain-based system that bypasses banks entirely.

Given that there are currently no rules or roadmaps for regulating payments outside of banks, as Facebook is proposing, it is easy to understand why the Fed wants to take its time in understanding the ramifications. Faster payments, on the other hand, is no longer anything out of the ordinary.

Go slow on Libra, Chairman Powell. But please, speed things up on faster payments.

Jennifer Tescher Contributor

I am the founder and CEO of the Financial Health Network, a nonprofit whose mission is to improve financial health for all.

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"A FORMER BANK CEO NAMED HIS BOAT 'OVERDRAFT'. NOW THAT BANK IS IN HOT WATER OVER THE FEES", BY JONELLE MARTE, WASHINGTON POST

Personal Finance

A former bank CEO named his boat 'Overdraft.' Now that bank is in hot water over the fees.

By Jonnelle Marte
January 22, 2017

Turns out overdraft fees are still big moneymakers for some banks. So much so that a former chief executive of a midsize bank named his boat after the fee.

That's only one of the ways that bank employees celebrated the money they made from overdraft charges, according to a lawsuit filed Thursday by the Consumer Financial Protection Bureau against TCF National Bank.

The government's consumer watchdog alleges that lofty sales goals drove the Minnesota-based bank to mislead hundreds of thousands of consumers into signing up for overdraft services. Consumers typically face overdraft charges of about $35 when they use their debit cards to spend more money than they have in their accounts. Federal rules put in place after the financial crisis prohibit banks from charging the fees on debit purchases or ATM withdrawals unless consumers opt in to the program. But the CFPB alleges that TCF violated those rules.

The agency said the bank made it seem as if overdraft services were mandatory for new customers by presenting them at the same time that customers were asked to agree to mandatory terms required to open an account. The move doubled the rate at which consumers were opting in to the service, according to the CFPB.

Federal rules also required banks to ask existing customers if they wanted to opt in to overdraft services. But the agency says TCF used vague language to have existing customers agree to overdraft services. For instance, existing customers were asked if they wanted their check cards to "continue to work as it does today." If they said "yes," then that was taken to mean that the customer had opted into the overdraft program.

At one point in 2014, some 66 percent of TCF customers had opted in to overdraft charges, about three times as much as other banks, according to the CFPB.

Branch employees were given various incentives to encourage customers to sign up for overdraft fees, according to the lawsuit. In 2010, managers at large branches were offered bonuses up to $7,000 for getting a high share of new customers to opt in to overdraft. Those bonuses were phased out, but some employees were told to aim to have 80 percent of new customers opt in to overdraft programs.

Bank executives celebrated the program's success by throwing parties when they reached certain milestones, such as having 500,000 people opt in to the charges, according to the complaint.

The bank told The Post in an emailed statement that employees who did not reach the quotas set for overdraft fees were not penalized or fired. TCF also said customers were given reminders that they could opt out of

overdraft programs and that the scripts used by branch employees "were not misleading in any way."

The lawsuit is in line with recent efforts from the CFPB to crack down on robust sales goals they say can lead to unnecessary costs and other harm for consumers. In September, the agency fined Wells Fargo for a scheme in which employees opened sham accounts for customers without their permission to meet sales goals and earn bonuses. And in November, the CFPB issued a memo warning financial companies against sales incentives that may lead to fraud.

The TCF case presents a few lessons for anyone with a checking account:

Know what you're signed up for. Although overdraft programs are optional, many people don't know they're signed up for the services until after they've overdrawn their accounts. Some 52 percent who said they paid overdraft fees in 2013 were either not aware that their bank charged overdraft fees or only learned of the charge after the fact, according to a 2014 report from Pew Charitable Trusts. If you're not sure whether you're enrolled in an overdraft program, call your bank to find out.

Track your balance. Sign up for alerts so that you can receive a text message or email any time your account balance falls below a certain amount. Check your balance before a purchase, and note any other checks or bill payments that may be pending.

Link to a savings account. Consider linking your checking account to a savings account so that you can have money deducted from the savings account when you're short in your checking account. There will still be a charge for this, but the fee is usually less than what you might pay for a traditional overdraft charge.

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