

**BUILDING ON A STRONG FOUNDATION:
INVESTMENTS TODAY FOR A MORE
COMPETITIVE TOMORROW**

VIRTUAL HEARING
BEFORE THE
JOINT ECONOMIC COMMITTEE
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BUILDING ON A STRONG FOUNDATION: INVESTMENTS TODAY FOR A MORE COMPETITIVE TOMORROW

WEDNESDAY, APRIL 27, 2022

UNITED STATES CONGRESS,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The WebEx virtual hearing was convened, pursuant to notice, at 2:30 p.m., in Room G-01, Dirksen Senate Office Building, Hon. Donald S. Beyer Jr., Chairman, presiding.

Representatives present: Beyer, Trone, Schweikert, Pocan, and Beatty.

Senators present: Lee, Hassan, and Kelly.

Staff: Ismael Cid-Martinez, Chelsea Daley, Hugo Dante, Sebi Devlin-Foltz, Ron Donado, Carly Eckstrom, Ryan Ethington, Tamara Fucile, Devin Gould, Owen Haaga, Erica Handloff, Colleen Healy, Jeremy Johnson, Adam Michel, Michael Pearson, Elisabeth Raczek, Alexander Schunk, Nita Somasundaram, Sydney Thomas, Ivan Torrez, Emily Volk, Brian Wemple, and Katie Winham.

OPENING STATEMENT OF HON. DONALD BEYER JR., CHAIRMAN, A U.S. REPRESENTATIVE FROM THE COMMONWEALTH OF VIRGINIA

Chairman Beyer. This hearing will come to order. I would like to welcome everyone to the Joint Economic Committee's hearing "Building on a Strong Foundation: Investments Today for a More Competitive Tomorrow."

I would like to thank all of our distinguished witnesses for sharing their expertise today. We have an exceptional panel of experts, and I am looking forward to hearing from them.

Two years ago the United States discovered its first case of COVID. Since then, hundreds of thousands of lives have been lost, and the Nation has experienced the worst recession since the Great Depression. Virtually overnight, more than 22 million jobs disappeared and the GDP cratered. This loss of life is a national tragedy and we mourn the lives that were taken too soon.

Today's hearing will focus on how our country is overcoming the economic effects of the pandemic and the steps we can take to ensure our economic health for the long term.

As we convene this discussion, our Nation's economic rebound has exceeded all expectations. The American Rescue Plan and other pandemic relief, including the successful dissemination of vaccines have created a remarkably different economic reality than the one

we were facing at the start of 2021. To date, nearly 93 percent of the jobs lost during the pandemic have been regained. The unemployment rate has fallen to just one-tenth of one percentage point above its pre-pandemic rate. And GDP has reached the fastest pace of job growth in nearly 40 years.

President Biden has overseen the creation of 7.9 million jobs, and 2021 set a record for the most new businesses ever started. Far from guarantee, the speed and strength of the economic recovery is a direct result of increased public investment.

Thanks to the effort of this Congress and the Biden administration, the United States has experienced the fastest recovery among G-7 nations. In fact, it is the only major economy who has recovered to its pre-pandemic economic growth or what would have been absent from a coronavirus recession. But the United States has not escaped the global spike in inflation that is denying workers and their families the full benefits of the recovery.

Global supply chain disruptions have pushed up prices worldwide, and Putin's invasion of Ukraine is exacerbating the effects of energy and food prices. We in Congress have an opportunity to lower costs for workers and families, spur job creation, and promote U.S. competitiveness now and for generations to come.

Evidence shows the public investment in research and technology drive innovation and boost productivity, which is the bedrock of economic growth. Historically, U.S. economic growth has been fueled by investments in science and technology that were initiated and sustained by public funding.

For example, we all know about the public investment in the Defense Advanced Research Projects Agency, DARPA, to help support the development of the personal computer and the Internet. Together, these growths in technologic revolution turbocharged U.S. productivity and radically changed the way people conduct their lives, not to mention the creation of hundreds of thousands of new jobs.

The goal of our government is to drive broadly shared economic growth, and ensure that the United States remains internationally competitive. Public investment is essential for this.

The recently passed bipartisan Infrastructure Investment and Jobs Act is a down payment. It will address years of inadequate Federal investment in critical infrastructure—roads, bridges, broadband—to create jobs, enhance productivity, and improve supply chain resilience.

The economy-wide benefits will reduce long-term inflationary pressures. Congress should build on this foundation and pass the Bipartisan Competition bills, drive economic growth, and shared prosperity. The investments in innovation, research, and manufacturing will boost our economic capacity, create high-quality jobs in communities across the country, and raise worker wages. And by promoting increased efficiency among workers and businesses, the investments will also lower costs. This is the long-term strategic structural way to address inflation.

The bill's focus on racial, gender, and geographic diversity and training and education will help ensure that communities that have been historically excluded are able to share in the benefits.

We have all experienced the many ways disinvestment in American-made products has contributed to a recent supply chain disruption, and the investments in this legislation will help to shore up American supply chains and domestic manufacturing.

The pandemic shined a new light on inequality in this country. It exposed underlying vulnerabilities in our economy that are constricting our collective potential. We have an opportunity now to lower out-of-pocket costs for families on the biggest household expenses, while also paving the way for economic growth in the longer term that is stronger, stabler, and much more broadly shared.

As we dive into these issues, I look forward to the testimonies of our expert witnesses. I would now like to turn it over to Senator Lee for his opening statement.

Senator?

[The prepared statement of Chairman Beyer appears in the Submissions for the Record on page 28.]

**OPENING STATEMENT OF HON. MIKE LEE, RANKING MEMBER,
A U.S. SENATOR FROM UTAH**

Senator Lee. Thank you, Mr. Chairman. Before the COVID-19 pandemic, pro-growth policies brought the American economy roaring to life in a way that bigger government and more central control never could. But while the strong economy lifted up all Americans, historically disadvantaged groups benefited the most. Unemployment for Hispanic Americans, Black Americans, and Asian Americans fell to the lowest rates on record. The unemployment rate for women dropped to its lowest level in almost 70 years, and low-income workers saw their wages rise at some of the fastest rates ever recorded.

All told, in the three years leading up to the pandemic, poverty reached an all-time low. Real median income increased by almost \$6,000 per household, and the bottom 50 percent of American households saw their wealth increase by over 70 percent.

The recipe for this broad-based prosperity was lower taxes and less regulation. Today, after two years of mandates, subsidies, and expert control, government has all but eviscerated this strong foundation. Americans have been forced to endure government's shuttering their livelihoods, schools, and communities.

Measured against the pre-pandemic trend, 6.6 million workers are currently missing from the workforce. These Americans are missing out on not only the financial rewards of the job, but also the community and purpose that come from work.

In contrast with the pre-pandemic economy that especially benefited low-wage workers and historically disadvantaged Americans, these groups are again falling further behind, with more government getting in the way, the middle class and low-wage workers that are hurting the most.

Democrats' \$1.9 trillion partisan spending has ignited the worst inflation in four decades, inflation that is hitting my home state of Utah harder than almost anywhere else. Even if prices were to stop rising tomorrow and things were just held in place as they are now, Utah families will have to pay nearly \$8,500 this year just to afford the same items that they purchased at the beginning of the Biden

administration—according to the Joint Economic Committee’s steak inflation tracker.

Meanwhile, school closures have caused devastating learning losses for the youngest and lowest income students. The Penn-Wharton Budget Model estimates that these losses will weaken our productivity and wages for the next 30 years. Unconditional stimulus checks and explicit anti-work incentives have increased the use of harmful substances at a time of vulnerability for many Americans. Drug overdose deaths are back to an all-time high, and suicides and alcohol abuse have also spiked.

Lockdowns have triggered rising crime rates across the country causing Americans to feel less safe in their communities. The murder rate jumped almost 30 percent in 2020, the largest increase ever on record. It is clear that so-called investments from Washington have failed to produce the prosperity the Biden administration promised. And many of the proposals I hear from my colleagues will make problems worse—much worse.

Plans to keep spending money that we do not have will pour more fuel on the inflation fire. Tax hikes on businesses will make it harder for Americans to innovate at home and harder to compete abroad. And legislation that takes a clue from China’s state-directed economy, by federally commandeering research and development here in the United States is the opposite of what has made America the world’s strongest and most prosperous nation.

We will never beat China by becoming more like China, never. We know what works. Before the pandemic, tax cuts and deregulation supported a thriving economy, one that benefited families and workers of all walks of life. The free market system that prizes ingenuity and rewards people for using their God-given talents in service of their neighbors resulted in benefits for the Americans who needed it most.

After two years of policies that have assaulted and eroded this strong foundation, I hope we can learn from our mistakes. I hope we have learned that when we choose to remove government barriers to Americans’ creativity and freedom, families of all types prosper.

Thank you.

[The prepared statement of Senator Lee appears in the Submissions for the Record on page 29.]

Chairman Beyer. Senator, thank you very much.

I would like to introduce our four distinguished witnesses. Dr. Josh Bivens is the Director of Research at the Economic Policy Institute. His areas of research include macroeconomics, fiscal and monetary policy, economics of globalization, and social insurance in public investment.

Prior to becoming Director of Research, Dr. Bivens was a research economist at EPI. Before that, an Assistant Professor of Economics at Roosevelt University, and provided consulting services to Oxfam America. Dr. Bivens has a Ph.D. in Economics from the New School for Social Research and a B.A. from the University of Maryland at College Park.

Dr. Michelle Holder is the President and CEO of the Washington Center for Equitable Growth. Dr. Holder is also an Associate Professor of Economics at John Jay College, City University of New

York, where she is currently on academic leave. Her research focuses on the Black community and women of color in the U.S. labor market. Before joining CUNY, Dr. Holder worked as an Applied Economist in the nonprofit and government sectors for a decade, and also served as Finance Director at Demos. Dr. Holder earned a Ph.D. and an M.A. of Economics from the New School for Social Research, an MPA from the University of Michigan, and a B.A. in Economics from Fordham University.

Dr. Sudip Parikh is the Chief Executive Officer of the American Association for the Advancement of Science, and Executive Publisher of the Science Family of Journals. From 2001 to 2009, Dr. Parikh served as Science Advisor and Professional Staff for the U.S. Senate Appropriations Committee where he was responsible for negotiating the budgets for the NIH, CDC, BARDA, and other scientific and health agencies. Prior to joining AAAS, Dr. Parikh was Senior Vice President and Managing Director of DIA Global. Before that, he was General Manager of the Health and Consumer Solutions Business Unit and Vice President at Battelle. Dr. Parikh earned his Ph.D. in Macro Molecular Structure and Chemistry from the Scripps Research Institute in La Jolla, California, and a B.A. in Material Science from the University of North Carolina at Chapel Hill.

Finally, Dr. Tyler Goodspeed is the Kleinheinz Fellow at the Hoover Institution at Stanford University. From 2020 to 2021, he served as Acting Chairman and Vice Chairman of the Council of Economic Advisors, after being appointed as a member of the CEA by President Trump in 2019. In that role, he advised the Trump administration's economic response to the Coronavirus pandemic, as well as subsequent economic recovery packages. He also served briefly as the Chief Economist—maybe not briefly—for macroeconomic policy and senior economist for tax, public finances, and macroeconomics at the CEA. Before that, Dr. Goodspeed was a professor of economics at the University of Oxford. He was a lecturer of economics at Kings College, London. He was also an adjunct scholar at the CATO Institute. Dr. Goodspeed received a B.A., M.A. and Ph.D. from Harvard University, and is a Kleinheinz Fellow at the Hoover Institution, Stanford University.

Dr. Bivens, we will hear your testimony, and then we will continue in this order. Dr. Bivens, the floor is yours.

STATEMENT OF DR. JOSH BIVENS, Ph.D., DIRECTOR OF RESEARCH, ECONOMIC POLICY INSTITUTE, WASHINGTON, DC

Dr. Bivens. Thank you so much. I would like to thank the Chair, Vice Chair, and Ranking Member, and the rest of the committee for the chance to talk today about building on a strong foundation.

I am Josh Bivens, a macroeconomist and the Research Director of the Economic Policy Institute. EPI is a think tank whose mission is to make sure the economic fortunes of low- and middle-income families are given their proper due in policy debates. And I would like to make a couple of quick points in the statement, and these are mostly fleshed out in the written testimony I have submitted.

First, I think U.S. economic growth before the pandemic over a span of decades was too slow and too unequal. Over each successive

business cycle since 1979, average growth slowed and the share of income accruing to the bottom 90 percent of the population declined. From this very broad overview, there does not seem to be any tradeoff between equity and growth. Instead, less equity has gone hand in hand with slower growth.

Second, overall growth clearly has been hampered by a pronounced slowdown in public investment over that time period. This contraction of public investment did not lead to more private investment; instead, all forms of investment have been weakened in recent decades outside of a pretty brief one-off period in the late 1990s as the U.S. business sector connected to the Internet. While there are some tools that hold some promise to induce more private investment, they largely do not include tax cuts for capital owners and corporations, nor a broad-based assault on Federal regulations. Instead, what can work to induce more private investment is to keep the economy penned at full employment, make sure recessions are short and recovery is rapid, and taking measures to incentivize technology of the future like things that might boost private investments in fields like clean energy. But of course the most direct way to boost overall investment through public policy is simply by undertaking more public investment in both shared physical infrastructure as well as human capital and families' economic security more generally.

Given the large rise in inequality in recent decades, income growth for the middle fifth of households has lagged far behind even the slower overall growth over this time period. Crucially, the vast majority of growth for the middle fifth of households could be attributed to the legacy of past rounds of large-scale investments in social insurance. To say it more plainly, without the influence of Social Security, Medicare, Medicaid, income growth for the middle fifth of U.S. households since 1979 would have been essentially stagnant.

Since the beginning of 2021, we have made a very good start in trying to build a better post-pandemic economy. The first order of business was undertaking the substantially more ambitious fiscal policy response to the pandemic recession. The result has been far more rapid jobs recovery since the end of the pandemic recession when compared to some other previous recessions.

However, stabilizing the economy after a shock is just a necessary, not a sufficient condition for reversing the slow and unequal growth of recent decades. A full reorientation of policy to significantly boost incomes and economic security for the vast majority requires continued public investments in both infrastructure and people.

Blocking these investments in the name of fighting the recent rise in inflation makes very little sense from either an economic perspective or a policy perspective. Fighting inflationary surges by throttling back demand growth is just not a job that fiscal policy is nimble enough to do. There are huge lags between the time when fiscal policymakers start debating an issue, passing a bill to address it, and then it gets implemented. Those long lags are why the Federal Reserve is the Nation's first-line of defense against inflationary surges. That division of labor makes a lot of sense.

The second reason why it makes little sense to block proposed investment packages in the name of fighting inflation is that most of these recent proposed public investment packages are not fiscal stimulus. It is not meant to be a very large surge of spending in the short run that boosts spending and puts inflationary pressure on the economy; instead, the spending is spread out over a long period of time. It is gradual. It is meant to provide long-lived investment, not fiscal stimulus. And many of the investment proposals put forward recently have been fully paid for. So that would blunt even the incredibly minimal inflationary pressure that spending would put into the economy.

The final way I would say the evidence linking the inflation of 2021 and early 2022 to sort of economic overheating caused by too generous fiscal relief passed in the wake of—passed in response to the COVID pandemic and the American Rescue Plan specifically, is exceedingly weak. Just the clearest reason why is; the inflation has been global. If you look across countries, they did very, very different things in terms of their fiscal response to COVID.

We were on the more generous end. Many countries did much less generous fiscal relief, and yet the inflation experience is about the same everywhere. So linking it to something that specific just in the U.S. misses the global picture.

And finally, I will just end by saying that going forward both the fiscal response to the COVID shock and further Federal investments will make future inflationary outbreaks like we have seen in the past year far less likely. This past year's inflation has its roots in past policy failures, most conspicuously the failure to invest enough in both fighting recessions with proper force, and in building up the Nation's full productive capacity.

Thank you so much for the opportunity to talk on this issue.

[The prepared statement of Dr. Bivens appears in the Submissions for the Record on page 31.]

Chairman Beyer. Dr. Bivens, thank you very much. We will now hear from Dr. Holder. Dr. Holder, the floor is yours.

**STATEMENT OF DR. MICHELLE HOLDER, Ph.D., PRESIDENT
AND CHIEF EXECUTIVE OFFICER, WASHINGTON CENTER
FOR EQUITABLE GROWTH, WASHINGTON, DC**

Dr. Holder. Well thank you, Chair Beyer. And thank you as well to Ranking Member Lee, Vice Chair Heinrich, and members of the Joint Economic Committee for inviting me to speak today. It is an honor to be here.

My name is Michelle Holder, as Chair Beyer noted. I am the President and CEO of the Washington Center for Equitable Growth, an organization that seeks to advance evidence-backed ideas and policies that promote strong, stable, and broad-based economic growth. I also serve as an Associate Professor of Economics at John Jay College, which is part of the City University of New York.

At Equitable Growth, we aim to understand how economic inequality in all its forms affects growth and stability. The evidence demonstrates the decades-long trends of increasing inequality that hurts both families and the long-term trajectory of the U.S. economy.

Making different policy decisions that support key public investments in social and physical infrastructure can help reverse inequality and make our economy stronger. Today I will show how three pillars of robust government investment have previously been and continue to be vital to promoting racial equity and boosting economic growth.

The first pillar is ensuring a full and equitable recovery from the COVID-19 recession.

The second pillar is revitalizing the manufacturing sector.

And the third pillar is strengthening the future by leading on green energy.

Let's start with the recovery efforts. By passing the CARES Act and the American Rescue Plan the government made key investments to support workers and stabilize our economy. What were the results?

For starters, the bounce-back in GDP was much quicker in the U.S. than any developed country. While inflation is elevated across the globe, as my colleague, Dr. Bivens, pointed out, the U.S. has created more jobs and higher wages than most developed nations. And the overall unemployment rate is now close to its pre-pandemic level.

One of the more powerful policies that came from the Federal Government's response was the expansion of the Child Tax Credit. By providing families with monthly income support to supplement their own earnings, the Enhanced Credit lifted an estimated 3.7 million children out of poverty. It also helped reduce racial disparities in household incomes, as poverty rates fell drastically for Black and Latinx children. This type of policy is a clear blueprint for success.

Building off this blueprint, government investments can also make a positive difference for the manufacturing sector that can once again be an engine for equitable economic growth. There is strong precedence for this. Research suggests that prior public investments in manufacturing, particularly during World War II, had long-term positive effects on growth, employment, and wages.

Historically, the manufacturing sector has been a path to the middle class, especially for Black and Latino workers with less formal education. While upward economic mobility has been limited by racism, including discrimination and segregation, manufacturing continues to play an important role in providing good union jobs.

A recent Economic Policy Institute report finds that Black, Latinx, Asian Americans, and Pacific Islander and White workers without a college degree all earned substantially more in manufacturing than in nonmanufacturing industries.

For instance, for median wage non-college educated employees, both Black and Latinx workers in manufacturing earned 18 percent more annually than in nonmanufacturing. The problem is, manufacturing employment in the U.S. has been steadily declining for decades, and productivity in manufacturing has been slow. This decline has resulted in significant earnings and employment losses, particularly for Black workers, many of whom live in former industrial hubs.

We therefore have ample room for investments in manufacturing. These can include, but are not limited to, “R&D” spending and equitable trade policies.

Finally, the third public investment pillar is strengthening the future by leading on green energy. Recent economic research demonstrates the importance of investment in green energy. For example, Columbia University economist Joseph Stiglitz demonstrates that investments in renewable energy and energy efficiency typically have high multipliers. Meaning initial investments generate additional economic activity over time and thus delivers high returns. They also create more jobs, including ones that cannot be taken offshore, such as those in home energy retrofitting.

Moreover, according to recent research from Heidi Garrett-Peltier, an economist at the University of Massachusetts Amherst, for every \$1 million in public investments in renewable energy or energy efficiency, almost three times as many jobs are created than if the same money were invested in fossil fuels.

In conclusion, there is clear precedent and ample opportunity for government investments to promote growth and address the harmful consequences of economic stratification in our Nation. To make the U.S. economy more resilient and equitable, we need to build off the strong foundations of the current recovery and continue to make robust investments, especially in manufacturing and green energy.

Thank you.

[The prepared statement of Dr. Holder appears in the Submissions for the Record on page 42.]

Chairman Beyer. Dr. Holder, thank you very much. We will now hear from Dr. Parikh. Doctor, the floor is yours.

STATEMENT OF DR. SUDIP PARIKH, Ph.D., CHIEF EXECUTIVE OFFICER, EXECUTIVE PUBLISHER, SCIENCE FAMILY OF JOURNALS, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, DC

Dr. Parikh. Thank you, Chairman Beyer, Ranking Member Lee, and members of the Committee. Thank you for inviting me today.

I am a biochemist and not an economist, so I want to talk about the future in a slightly different way. I would like to ask a simple, hopefully rhetorical, question, which is: Do we want to be the Nation that discovers, develops, and manufactures the economic, environmental, and health advances of the future? Or do we want to be a nation that lags in these critical areas while we attempt to buy solutions from at best friendly competitors or, at worst, geopolitical adversaries.

In the 1800s, Europe was the center of gravity for scientific discovery. English scientist Michael Faraday was describing an electricity-related discovery to Parliament, and future Prime Minister William Gladstone asked: What use is it? And Faraday supposedly replied: I don’t know, but there’s every probability that you’ll soon be able to tax it.

He was right. The discovery of electricity marked an inflection point in history. It opened entirely new fields of technology and improved the well-being of humanity, leading to everything from the

light bulb to the Internet. It also grew the economy in ways that we never imagined.

Now today we stand at the cusp of similar inflection points in many science and engineering fields. Just three weeks ago, scientists at the Fermilab in Illinois reported that the W boson, which is a fundamental particle, weighs more than was predicted by the Standard Model of Physics. Now you may ask what that means.

If this finding is repeated and verified, it means that there is a completely new frontier of physics for us to discover beyond what is currently known. It can be a discovery that parallels Benjamin Franklin's epiphany that the sparks that he could make on earth were caused by the same phenomenon as lightning in the sky. A little bit more expensive than a key, but it is the same kind of thing.

And someday it could lead to entirely new parts of the economy that you might even be able to tax. Now even if this discovery does not pan out, we are at similar inflection points in the fields of artificial intelligence, quantum computing, synthetic biology, gene editing, space travel, and more. We are at the cusp of revolutions in multiple sciences at once, with potential implications for our economy that could be as game changing as electricity.

Now for over 75 years we have followed a recipe that has grown our economy in ways that you could not have thought of at the beginning of the 1900s—investments in research at the Department of Defense, NIH, NSF, and 20 other Federal agencies, coupled with complementary investments by industry have driven transformative innovations. And investments in R&D have led to sustained bursts of economic activity, bursts of exponential growth in new industries that have led to good jobs across the spectrum. Now this recipe has been so successful that other nations have copied it. Increasingly with even more vigor than us.

Now the time has come for us to redouble our efforts and build on our strengths and show the world again what American intellect, ingenuity, investment, and risk-taking can accomplish for the benefit of all Americans. So today I would like to make three recommendations to ensure that we continue to lead the world in scientific discovery and deliver it to benefits to all.

The first is to provide robust investment in research and development across a broad range of disciplines and geographies.

Second, we should be investing in our people to ensure that we are drawing upon the talents of all Americans in our scientific research, and that all Americans benefit from our investments.

Third, we need to balance a portfolio of R&D investment that includes short-term incremental research, translational research, and high-risk/high-reward research that, if successful, can change lives and revolutionize the economy.

I provide a lot more detail about these recommendations in my written testimony, but it is important to remember that the world is not standing still. Remember that the extraordinary result I talked about from scientists at Fermilab that might change our fundamental understanding of physics, well the instrument where that data was collected was decommissioned several years ago. So the verification of that result is not going to come in the U.S. It

will have to come from the cutting edge instruments of today which are based in Europe and Asia and not in the U.S.

In the last 20 years, the U.S. R&D expenditure from all sources, government and industry, has only grown at the rate of 3.1 percent annually in constant prices. This investment has been eclipsed by the meteoric 14.3 percent annual rise in China's R&D expenditure over the same period, as well as more robust investments by many others. Look, no nation on earth is more responsible than the United States for getting us to the cusp of inflection points in so many scientific disciplines, inflection points that can create step changes in economic growth and human well-being.

The decisions that we make today on where and how to invest are going to determine whether we will make the discoveries and translate the science into health and prosperity, or whether someone else will, or whether, worst of all, no one else will. So will the advances that change the world come in Chicago, in Shanghai, or nowhere?

Recognizing our potential, I remain optimistic that we are going to rise to the challenges, and I stand ready to work with you and look forward to your questions. Thank you.

[The prepared statement of Dr. Parikh appears in the Submissions for the Record on page 54.]

Chairman Beyer. Dr. Parikh, thank you very much. And now let me finally recognize Dr. Goodspeed for his testimony.

STATEMENT OF DR. TYLER GOODSPEED, Ph.D., KLEINHEINZ FELLOW AT THE HOOVER INSTITUTION, STANFORD UNIVERSITY, STANFORD, CA

Dr. Goodspeed. Thank you, Chairman Beyer, Ranking Member Lee, Vice Chairman Heinrich, and members of the Committee. I served on the Council of Economic Advisors from 2017 to 2021, including as Acting Chairman of that Council from 2020 to 2021. I am now a Kleinheinz Fellow at the Hoover Institution at Stanford University.

I wanted to take this afternoon to reflect on the economic recovery from the two most recent U.S. recessions, and the lessons from those recoveries for prospective economic policy.

So the labor market recovery from the 2007 and 2009 global financial crisis was the slowest in post-war U.S. history, taking 77 months to recover the jobs lost during the recession, compared to a post-war average of 23. And when the Council of Economic Advisors studied this unprecedentedly slow recovery, we observed two historical anomalies.

First, the contribution of capital intensity to labor productivity growth actually turned negative. That means that firms' investment in new plants and equipment per worker was insufficient to keep pace with the depreciation of existing capital plants and equipment per worker.

Second, despite ongoing population growth, the prime age labor force in the United States—those between the ages of 25 and 54 either employed or actively looking for work, shrank by 1.6 million workers from the start of the recovery in July 2009 through the end of 2016.

So it was in response to this phenomenally slow recovery that in 2017 to 2019 the U.S. Government implemented an agenda of tax and regulatory reform designed to lower the cost of domestic business investment, including in domestic energy production, and to reduce tax expenditures and reinvest those revenue savings into marginal personal income tax rate reductions in order to encourage increased labor force participation. And the results are quite striking.

So whereas between July 2009 and December 2016 the prime age labor force shrank by 1.6 million workers, from January 2017 through December 2019 the prime age labor force actually increased by 2.3 million workers. Real inflation adjusted wages for the bottom tenth of the wage distribution rose 10 percent during that period, compared to 5 percent for the top tenth of the distribution, the exact opposite pattern of what prevailed from July 2009 through the end of 2016. And real median household income in the three years from 2017 through 2019 rose by more, \$5,900 bucks, than in the entire 20 years from 1996 to 2016. So as a result, wages, income, wealth equality declined, labor share of income rose.

Now that is where we were on the eve of the COVID shock, which the Organisation for Economic Co-operation and Development projected would result in a 12 percent decline in U.S. output over the four quarters of 2020. And the congressional Budget Office projected that the unemployment rate would end the year above 10 percent.

Instead, the unemployment ended the year at 6.7 percent, and even the broadest measure of labor market underutilization had declined to 11.7 percent, which was lower than in August 2014. So by December 2020, the U.S. had recovered 55 percent of the job losses of March and April 2020 and the U.S. economy had recovered 78 percent of the decline in the level of output.

So it was in the face of this 11-month-old recovery, that Congress in March 2021 passed a fiscal stimulus equal to 9 percent of the U.S. economy, with the immediate effect that demand for goods increased 10.7 percent month over month in March 2021. That was a huge increase in demand, at the same time the supply side was still recovering. And furthermore, some of the provisions in that package actually further impaired the supply side recovery by raising implicit marginal tax rates on the return to work, and introducing some business tax uncertainty.

As a result, whereas in the 12 months through February 2021, inflation had risen by less in the United States than in the Euro area. Since February 2021, the increase in the rate of inflation in the United States was five times greater than in the Euro area, using a harmonized index of consumer price inflation to compare apples to apples. Therefore, explanations of high U.S. inflation that are global in nature, semiconductor shortages, supply chain disruptions, cannot explain all or most of the increase in inflation in the United States-because inflation has risen by so much more here than in other advanced economies. And as a result, sector-specific investments and subsidies are unlikely to resolve inflationary pressure that is fundamentally macroeconomic in nature.

Rather, I think the lesson of recent recoveries from recessions in the United States is that we should ensure a broad-based incentive to domestic capital formation and labor force participation. The lesson from 2017 to 2019 is that this is the policy recipe for generating strong and longrun and sustainable economic growth that delivers real gains across the income distribution.

[The prepared statement of Dr. Goodspeed appears in the Submissions for the Record on page 64.]

Chairman Beyer. Dr. Goodspeed, thank you very much. We have heard from our witnesses, and now turn to questions.

Let me start with Dr. Bivens. In your recent testimony you say many continue to insist that the American Rescue Plan is the root cause of recent inflation—in fact, we just heard this from Dr. Goodspeed—that that hence any further fiscal policy interventions should be blocked in the name of reining in this inflation. And these arguments rest from extraordinarily flimsy evidentiary grounds.

Dr. Goodspeed has postulated that the inflation is fundamentally macroeconomic in nature, which in my interpretation means too much money. The unemployment insurance, Child Tax Credit, and the like.

Dr. Bivens, why is this argument false? Why is this not true?

Dr. Bivens. As I sort of mentioned in my statement, and which is in my testimony, the rest of sort of—for countries we have data on what the fiscal response to COVID was, kept by the IMF from their fiscal policy data base where they measure countries' response, there is no relationship between the size of the fiscal response and the acceleration in inflation those countries have seen in the past year relative to the pre-pandemic.

And so any idea that we can sort of pin the uptick in inflation we have seen in the U.S. on specific pieces of legislation particularly, I just do not think it is there, because we can do that using the IMF data on fiscal policy response and inflation. And then I think there are plenty of other reasons to think it is not just a simple imbalance of supply and demand. I think there is lots of distortions that the pandemic imposed on the U.S. economy and the global economy that can account for a lot of the common inflation experience.

And then finally I would just say there is an argument about the past. It is good that we have it. We should understand what happened. Then there is an argument about what's—going forward, and the sort of investment packages that have been proposed in Congress in recent months. Those are very different from the fiscal stimulus that was passed earlier in the year. Whatever you think about the American Rescue Plan, it was meant to be stimulus. It was meant to be entirely front-loaded and to provide a real sort of burst of spending in a very short period of time. The proposed investment packages largely in front of Congress, they do not do that. They are much more gradual, much less of the spending hits in the first year. They are meant to be a near-permanent increase just in the level of public investment that is done. So even their spending will have much less inflationary effect. And then many of the proposals come with pay-fors that will raise revenue and that will fur-

ther blunt even the very minimal inflationary impact that might come from the spending.

So I think the analysis of why do we have inflation so far, linking it to the American Rescue Plan, is pretty flawed, and then I think even if you believed that, that has very little relevance to the debates about whether or not we should do long-lived investment plans which are different than the stimulus that people are talking about in terms of past fiscal measures.

Chairman Beyer. Thank you very much.

Dr. Holder, you wrote and spoke that employment gains made by Blacks, women, and Latino workers suggests that the recovery efforts in the past usually come to them last. And in this recession, it hit a much quicker pace than previous recessions. What part of our Rescue Plan so far has helped the people who need it most?

Dr. Holder. Yes. Thank you for the question, Chair Beyer. So I will talk about the American Rescue Plan. Now that piece of legislation helped an average of over 500,000 jobs per month through the end of 2021, for a total of 6.1 million new jobs in 2021.

As my colleague, Dr. Bivens, just noted, the American Rescue Plan was a fiscal stimulus meant to encourage and to support increased demand for goods. And by doing that, the natural result would be job creation. And so ARP precisely reached that goal of increasing demand, stimulating demand, and thereafter leading to job creation.

And by comparison, that level of job creation, half a million jobs per month, eclipses monthly job growth after the Great Recession, our last cyclical downturn, which job creation averaged just about 130,000 jobs a month from 2010 to 2011.

Economic evidence suggests that success also extends to wages. Wages are increasing for those who have historically been left behind during past recoveries. Using the Atlanta Fed Wage Growth Tracker, we see younger workers saw a 9.7 percent wage increase, and the bottom 25 percent of earners saw a 5.1 percent raise. Workers with a high school education and those at the bottom of the income distribution all saw wage growth stronger than average for a recovery period.

This is still true when you account for the effects of inflation. Multiple sources find that around the bottom 70 percent of workers had real hourly wage increases over the past two weeks. While there is still much work to be done such as the CARE sector which is currently lagging behind, it is clear that the recovery efforts have been a boom to working families. And I will end by saying actions such as the Economic Impact Payments, the Supplemental Unemployment Insurance Payments, \$350 billion in funding for state and local governments to save jobs and sustain aggregate demand in the face of budget shortfalls, and other measures were vital to supporting families as the economy recovered.

Chairman Beyer. Thank you, Dr. Holder, very much.

My time is up. I am hoping we have a second round because, Dr. Parikh, I want to get back to you on the boson before we go.

So we have the good Senator from Utah, Senator Lee.

Senator Lee. Thank you.

Dr. Goodspeed, President Biden and many of my colleagues here claim that inflation is primarily the result of two things. First,

Russia's war on Ukraine. And secondly, corporate greed. But you noted in your testimony that inflation was caused by the Federal Government flooding the economy, and doing so with more than \$5 trillion of spending at the same time that politicians were trying to keep our businesses closed and actively disincentivizing work.

Now Dr. Bivens argues that the evidence linking inflation to fiscal stimulus is, quote/unquote, "exceedingly weak."

Can you break this down for us? To what extent is inflation the result of some combination of corporate greed and Putin's aggression on the one hand, and on the other hand to what extent has inflation been triggered by excessive fiscal stimulus?

Dr. Goodspeed. Thank you, Senator. So I think that the important thing to do is to have an appropriate control group. And that is why in my testimony I pointed to the Euro area, which is another large advanced economy, globally integrated. And, yes, there was fiscal stimulus across advanced economies in 2020. The key divergence occurred in 2021, and specifically March 2021, and that is why I think it is an observation that must not be ignored that in the 12 months through February 2021, inflation in the United States averaged 1 percent. Inflation in the Euro area averaged 1.1 percent. Since February 2021, the increase in the rate of inflation in the United States has been more than five times that in the Euro area, and that preceded the invasion of Ukraine by the Russian Federation.

Senator Lee. That makes sense to me. It seems like a very good control group, and I think that backs up your answer.

Dr. Goodspeed, as you pointed out, the economy delivered widely shared prosperity for Americans prior to the pandemic. In 2019, the real median household income grew by a record 6.8 percent. And this took us to an all-time high of nearly \$69,000. Poverty, meanwhile, fell to a record low for Americans across every race and every ethnicity.

Now some analysts have claimed that our prior economic achievements were simply a natural continuation of the roughly decade-long recovery from the Great Recession, and that workers would have been even better off had the government spent and regulated more during the years between 2008 and 2020.

Do you think that alternative narrative is correct? And what do you think we can learn from the pre-pandemic economy that might be applicable today?

Dr. Goodspeed. Right. So first of all, one can estimate a trend in various macroeconomic indicators during the expansion period from July 2009 through the end of 2016.

You can project those trends into 2017, 2018, 2019, and there was a huge out-performance relative to trend. But you do not have to take my word for it on that. Just look at what the Congressional Budget Office, the nonpartisan congressional Budget Office, was projecting in their final projection in 2016. And relative to those projections, the U.S. economy through the end of 2019 added 5 million more jobs than projected. And in the first two months of 2020 alone, the U.S. economy added more jobs, almost half a million, than the Congressional Budget Office had previously projected for the entire year.

GDP, the gross output of the United States' economy, was \$300 billion, or 1.2 percent larger, and the unemployment rate was 1.4 percentage points lower. So I think that this was an out-performance relative to trend and relative to forecast. And I think the lesson to be learned is that when you have in place broad-based incentives, as I pointed out earlier, increased domestic business investment and increased labor force participation, then you observe gains across the board. And in fact we saw, as I said, not just the bottom tenth of the distribution doing better than the top tenth, we saw wealth inequality decline. We saw workers wages rise faster than managers' wages. And that was a complete reversal from the trends that were underway pre-2017.

Senator Lee. Thank you. That is helpful. As I mentioned in my opening comments, I am a little bit worried about the fact that both the House and the Senate have passed different bills in the direction of industrial policy to the tune of \$250 billion to \$400 billion in Federal spending.

Do you think going down that path, the path of state-sponsored industrial policy, is the best way to help us achieve long-term economic growth? And what do you think the consequences of that would be?

Dr. Goodspeed. Well, it has not worked in the past, and I might suggest that you just ask the United Kingdom or France circa 1970s.

Senator Lee. Right. Thank you. I see my time has expired. Thank you, Mr. Chairman. Thank you, Dr. Goodspeed.

Chairman Beyer. Thank you, Senator, very much. Let me recognize our distinguished Congressman from Madison, Wisconsin, Mr. Pocan.

Representative Pocan. Thank you very much, Mr. Chairman. And thanks to all of our panelists today. You are appreciated.

It seems odd that we have had record fast recovery. We have got job creation and low unemployment. Because of quality science, we are largely leaving the COVID era. The COVID hangover is done. Yet inflation right now for people seems to block all of those really good things that have happened. The Rescue Plan, as Dr. Bivens talked to us, we have money in the economy, the Infrastructure bill and the more long-term way to put money into the economy.

But what I just heard was that inflation, according to Democrats, is because of the war in Ukraine, which certainly is having an additional impact on gas prices and on corporate greed, which I am going to ask about in a second, but I have been a small business owner since I was 23 years old, since I had a pretty full head of hair, a long time ago, and I can tell you what I found is when everything reopened last year, here in the country and around the world, because we do not make enough things in the United States, and because everywhere stopped production, there was a lot of demand for everything at once. Scarcity. Scarcity drives up the cost of goods, and we are all paying more. There were three steel increases last year. I had one this year. And I just got a new one that went up 11 percent again on purchasing steel.

So I guess the questions I have, Dr. Bivens, let me start with you, I mean this question of corporate profits, I went to your website and I saw you have got some stuff there. Can you talk a

little bit about corporate profits and inflation? And can you talk about the fact that we don't make things here anymore? And we have lost that control, and how that effects inflation in particular?

Dr. Bivens. On the corporate profit issue, I mean just as a matter of decomposing what has driven in an accounting framework, sort of the rise of prices and sort of the nonfinancial corporate sector. We have data that lets us do that.

During normal times, labor costs are supposed to contribute about 60 percent of the costs; profits about 15 percent. If you look at sort of the trough of the pandemic recession until now, labor costs are only contributing about eight percent. Normally it is 60. Corporate profits are well over 50 percent. It is supposed to be 15, one-five. And so it is clearly the case that it is sort of thicker profit margins that are in an accounting way the much bigger thing driving price increases. What does that mean? I mean to my mind it means a couple of things.

One, there were some extreme distortions imposed on the economy by the pandemic, and basically a huge swing away from services into durable goods. Take the example of used cars. A lot of people moved to the suburbs, no longer take public transit to work. They have to get a car. A huge demand in this narrow sector of used cars. Just the supply chain snarls that are also driven by the pandemic made it really hard to deliver those used cars. If you were a dealer who had cars on your lot, you made out like gangbusters, and so your profit margins went up.

And so I think it is mostly those pandemic distortions that have channeled corporate power into price increases this time. And then I think, you know, I just talked about the supply chain snarls being a forcing factor there. Yes, I think a lot of those snarls are because over the past couple of decades we have chosen a mode of production to just make sure the component is always produced in the absolute cheapest place possible, without trying to build any resiliency into the system. And so I think that has led the companies to spread out things in ways that made supply chains very fragile because they were way too myopic. And I think that is a big problem, and I think we also just did not do the public investment in the basic infrastructure that would have provided more resiliency, too. So I think all those things add up to the perfect storm of inflation that we have.

Representative Pocan. And if I can in the minute and ten seconds or so I have left, specifically gas and food. Those are the two biggest things I am hearing wherever I go. I remember when gas prices went up last March when Texas did not invest in their grid and they had cold weather and suddenly power went out and prices stayed up. And, yes, they have gone up again because of what is happening in Russia and Ukraine. But they maintained that level for a long time, and also on food prices.

Can you talk just a little bit about gas and food in 46 seconds?

Dr. Bivens. I will try. So the gas and food prices tend to always be volatile. There is very little you can do in the very short run with macro policy to tamp them down, and you probably should not try. You will just cause more collateral damage if you do.

People forget. They also do go down. They really do, eventually. And so that is the only sort of word of comfort. And I do think

there is some suggestive evidence that they do not necessarily go down quickly enough after a spike, and that could actually be some manifestation of corporate power, and even some price gouging. And so to the degree that regulatory agencies should keep an eye on that, and to make sure that prices go down as input costs go down, I think that is something to think about for sure.

Representative Pocan. I appreciate it. I yield back, Mr. Chairman. Thank you.

Chairman Beyer. Thank you, Mr. Pocan, very much. I will now recognize my friend from Arizona, Doctor—Congressman Schweikert.

Representative Schweikert. Thank you, Chairman Beyer.

Interesting witnesses. Some bizarre statements, and particularly in some of the writeups, but I guess it is not polite to take shots at each other's witnesses. And particularly one of the witnesses—and forgive me if I mispronounce the name—Dr. Parikh really, really appreciate the discussion and fixation on disruption and technology leaps, and what that means to future prosperity.

I almost wish I could convince Don to have a discussion of what a disruptive competitive economy embracing technology would mean for productivity, for the wealth of the working poor, those things.

But, Mr. Chairman, I have a number of charts and reports I wish to put into the record that basically show—and it's graph after graph after graph that the Democrats on your spending binge from last March, and you can actually see on charts. Here is one on rents, on fuel, on food, that basically you see the charts just blow up after March of last year. So with your permission, I would like to submit those for the record.

Chairman Beyer. Without objection.

[The graphs of Representative Schweikert appear in the Submissions for the Record on pages 70–78.]

Representative Schweikert. Dr. Goodspeed, sometimes the simplest chart actually explains the story. I am holding one here that basically is inflation and real wages. So real purchasing power for the working poor, the middle class, and it shows, as you see that alligator mouth expanding, it shows you that the fact of the matter is the brothers and sisters in this country are getting poorer every single day. And the math is the math. I mean I know our friends desperately want to run away from this, but the math is the math. They are getting poorer every day, and it is because of fiscal policy, and probably 50–50. It is half the Federal Reserve built a pile of kindling, and a year ago we threw a flaming log on it.

I turn to you, Doctor, and said from a policy standpoint what could we do right now to spike productivity so we would make more things? So there would be more goods and services to purchase, maybe tapping down inflation? Are there things we could do to encourage people to move money into their retirement funds to remove liquidity?

What could we as Congress do right now to do some mitigation of this inflation monster that is really hurting retired people and working people in the country?

Dr. Goodspeed. Well thank you, Congressman. And, yes, I think you are quite right to point out that real wages—wages have been struggling to keep pace with inflation. And historically that is what happens, because wage contracts tend to be negotiated at lower intervals than other prices, and so real wages for average American workers have been declining.

I think that there are a number of things that Congress could be doing now. One would be to help make up for the large cumulative shortfall in business investment in the United States that has accumulated since the start of the pandemic. Introduce some business tax certainty so that firms have an incentive to invest in more plants and equipment in the United States. Because right now there has been a lot of uncertainty both in the direction of the statutory corporate income tax rate, but also on the question of whether or not the full expensing of new equipment investment will be extended.

Representative Schweikert. Doctor, right there on that subject. You say, okay, expensing right now, I think this year we fell to what, 80 percent of the purchase. And then if you do inflation, the costs of the new productive piece of equipment, it is actually—you know, if it has gone up 20 percent, you are looking at a 40 percent margin. You have to have a very substantial step up in productivity for that capital investment to actually have value.

From a policy standpoint, what if we did a—we put expensing back to 100 percent, but you do not get it until the productive piece of equipment is in production, is actually producing? What would you do?

Dr. Goodspeed. Well, without getting into the technicals, I think that some certainty over the longer run direction of expensing is one way to now increase business investment not only in equipment but also I would consider expanding it to other asset types. In addition, I would be looking to provide some regulatory certainty for domestic energy production. And I would provide some certainty on the future direction of marginal personal income tax rates to help encourage workers to return to the labor force because we are still well below pre-COVID levels of labor force participation.

Representative Schweikert. I appreciate that, Doctor. I think on the energy hydrocarbon production, unless we get something cleaned up on the capital stack and the regulatory threat there, I am fearful we are going to continue to fall further behind in energy.

Mr. Chairman, thank you. I yield back.

Chairman Beyer. Thank you, Mr. Schweikert. Now let me recognize my friend from Maryland, Congressman Trone.

David, I think you are muted.

Representative Trone. Okay, are we on, Mr. Chairman? Thank you, Mr. Chairman.

Dr. Bivens, in your testimony you talked about ambitious fiscal policy response to the pandemic recession to help pave the way for a stronger recovery. I always see big investments of the American Rescue Plan, nationally, locally. We are proud to have a \$60 million funding in the American Rescue Plan to the Mental Health Association and Addiction in Maryland, which helps Marylanders. What

investments can we make to help provide resources for individuals who are working toward recovery, and those entering the workforce after they have sought treatment?

Dr. Bivens. That is a really good question. I would say, so I am not an expert in that sort of human services investment. I do think the great thing about the American Rescue Plan, or one of the great things about it, was it gave a lot of flexibility to state and local governments, along with substantial resources, in order to let them expand those investments. But in terms of the specific ones we should make and the research on that, that is not my sort of wheelhouse of expertise.

Representative Trone. Okay. Any idea of how to highlight these on a state and local level?

Dr. Bivens. No great ones. I mean I would definitely say, one thing I appreciated as well about the fiscal relief that was included in the ARP to the state and local governments was the Treasury Department provided a set of guidelines about what that aid could be and should be used for. And it sort of prioritized things that really would be investments in historically disadvantaged communities, investments in economically distressed communities were really high on the list of things they urged state and local governments to invest in.

It sounds to me, as a nonexpert, like those sorts of investments absolutely fit the bill. It discouraged things like, it actually forbade just tax cuts across the board. And so it really urged state and local governments to make those investments targeted. How well each state is doing is probably subject to a ton of areas.

Representative Trone. Okay, to jump over to Dr. Parikh, in your testimony you highlighted the importance of diversity in scientific research. In Maryland, high school graduation rates were on the rise, especially in underrepresented communities. So unlike their peers, the underrepresented students face additional barriers to higher education that is typically required for a STEM career.

So what do we do to level the playing field for students of all backgrounds? And what role do career training centers play in bridging that gap?

Dr. Parikh. Thank you, Congressman, for that question. We have to start very early, but we have to be able to—if we are to level the playing field, we have to make up for a whole bunch of challenges that have built up over time. And that means starting very early with education around science and math and engineering with kids that are even pre-kindergarten who can be excited about math. There is a program in Chicago on the South Side of Chicago that gets young boys and girls on the south side of Chicago interested in algebra in the 5th grade. And it has over 600 alumni that are populating companies like Boeing, and elsewhere, terrific engineers. It shows that at the small scale we can do this. We just have to scale up those kinds of programs to get these kids there.

Representative Trone. Our competitors like China and India, are they starting this early?

Dr. Parikh. They are starting extremely early. I will tell you, I can tell you from my own personal family experience that if you are a young child in India, being an engineer or being a doctor is part of the culture. It is part of what we are teaching—of what is being

taught to kids that they are going to become. And we have got to be doing that here. We have to set people's expectations to be that high.

Representative Trone. U.S. global research, when you see 39 percent of it, Doctor, now we are down 30 percent and we are heading the wrong way. What are your thoughts about career training in this area, trying to get world class talents?

Dr. Parikh. We have got to make sure that we are pulling talent from the Central Valley of California, from the Appalachia area, from the Mississippi Delta, and from Palo Alto and from Cambridge. We have got to be pulling all of our talent. Because, look, there are 1.4 billion people in China and there are 330 million people here. We are not going to win this on just sheer numbers.

We have this amazing diversity of thought and diversity of experience that comes from the fact that we are a remarkably diverse nation. And we have high achieving scientific minds in every one of those places. We have got to pull from every one of those areas, and also—

Representative Trone. How about if anybody who came here to our country to study if we gave them a path to citizenship?

Dr. Parikh. We are—we have been on record saying that it would be very important for having scientists who come here to train, that if they stay here and they want to be Americans that we should provide a path.

Representative Trone. I yield back, Mr. Chairman.

Chairman Beyer. Thank you, Mr. Trone, very much. Votes will be here in about 15 minutes, so we have some more time and I would love to start a second round for anybody who is with us.

Let me begin. First, Dr. Parikh, thank you for bringing up the heavy W boson. I had not heard that yet, and I am anxious to hear how we tax it. In the meantime, I know in your AAAS role you know how exciting it is what is happening on the fusion side. As we think about a limitless source of energy, what it can do to economic growth, to poverty, and of course to climate change in the immediate future.

And by the way, this is more than a trillion dollars just for fusion. So how does the long-time horizon, the nonstimulus nature so that there is the infrastructure bill, how does that play out over the economy? Is it better, or worse as an investment?

Dr. Parikh. It is an incredible investment. Because what happens—and we have seen patterns of this throughout history—is that in certain areas we get to an inflection point. Fusion is one of those areas. Fusion has always been—the joke has always been it is 40 years away. And that we are not quite there.

But those are remarkable amounts of energy right now in the private sector and the public sector moving toward sustainable energy production by fusion. There are public companies that are getting investment, and that hope to have inputs and outputs equal by the end of the decade. Now that would be a remarkable achievement. That is harnessing the power of the sun here on earth and getting just as much energy out as you put in.

Now the government is doing that. There are governments around the world working on it. And what it shows is the power

of the American ecosystem. We have financial capital. We do have world beating companies that are working on fusion.

We have the U.S. investment in ITER, which is in Japan. We have got an incredible amount of talent that comes together in this ecosystem of public and private sector that if anybody can do it, I put my money on us.

Chairman Beyer. Thank you very much.

Dr. Bivens, I was struck this afternoon by the different fact sets, figure sets, data sets we have on the past. I respect Dr. Goodspeed's many different charts and analyses, but I am having trouble reconciling some of them with at least the facts that I have read. How can it be that the bottom 10 percent grew more quickly, their incomes, than the top 10 percent when almost all of the Tax and Jobs Act went to the top 10 percent? And when the wealthiest two individuals in America have more assets than the bottom 50 percent combined?

How do you put those together?

Dr. Bivens. I think there is something important there, and there are two separable questions, which is: What is the state of the macro economy and the business cycle and labor market tightness versus what is the policy doing to either contribute to that or to do things outside of that?

And so I totally agree that 2017, 2018, and 2019 were actually quite good years from a business cycle perspective. I disagree, like I think it really was just a continuation of trend. I think what really was the sort of game changer in 2017, 2018, 2019 relative to what the CBO predicted beforehand was the Federal Reserve who for the first time in a long time said, you know what? We are going to let unemployment fall really, really low without preemptively stopping the recovery.

And so I think those were pretty very good years, low unemployment, lots of gains including for low-end workers, and so reinforces to me the value of low unemployment is really a good thing and something policymakers should always target.

Then the question becomes: Did the Trump administration policies do anything to lock that in and make it happen faster, secure it for a longer time? And to my mind, the answer to that is absolutely not, for the reason you said. Their signature policy achievement was a tax cut for owners of capital.

So the direct benefits went to the richest households. It did almost nothing to boost economy-wide investment, which was its sort of stated rationale. So I think it is true that tight labor markets are really good for workers, particularly historically disadvantaged workers, and we had tight labor markets in 2017, 2018, and 2019. I just do not think the Trump policies were the reason why labor markets were tight. I think it really was just a continuation of trend, along with the change, and admirable change, in Federal Reserve policy that allowed that to happen.

Chairman Beyer. And despite all that, even with the Tax and Jobs Act, we never did get the 3 percent growth. In fact, I believe that growth in 2019 before the pandemic was 2.3 percent, which was, you know, like what it was in 2014.

I mean, I am not bragging on how fast things grew. They grew too slow.

Let me—I should move on because the clock has turned green, but Mr. Schweikert, are you still with us?

[No response.]

Chairman Beyer. Actually, he abandoned us. So I will keep going. Please answer. You seem eager to, Dr. Bivens.

Dr. Bivens. Yes, sorry about that. I put myself on mute. I agree with that. I would say the Tax Cuts and Jobs Act really was a pure redistribution policy. It just redistributed a bunch of money to people who own corporate equities, largely, and it had almost no footprint at all in increasing the rate of growth in the economy.

And I think the biggest indicator of that is the way it was going to increase the growth rate of the economy, like the way most proponents talked about it, was increasing business investment. That was really the centerpiece of the economic case for it. Business investment did not increase in the wake of the TCJA. It was clearly decelerating rapidly before the pandemic hit.

It just had no impact at all on the aggregate economy. All it did was redistribute income around. And it redistributed to the top, which is not the way I would prefer that happen.

Chairman Beyer. Dr. Holder, in your leadership at the Center for Equitable Growth, one of the things the Joint Economic Committee in these two years has really focused on is income inequality, and wealth inequality. And what are you seeing happening to the GINI Index, especially looking at it over the last 10 years, and over the last 50 years? Because I keep reading things like Bob Putnam's book that it has not been this bad since the 2013–2015.

Dr. Holder. Yes, I thank you for that question, Chair Beyer. You know, the evidence is very clear that income inequality in the U.S. is increasing. So with regard to the GINI coefficient and the direction that that is moving, it is absolutely clear that income inequality is widening in the U.S. And I will, if you will permit me, we do not only need to look at where GINI coefficient is going. We could also look at the distribution of income over time. And this is actually a really simple exercise that I give my students in terms of really proving that more income is going to the top 20 percent of households in this country, and less income to the bottom 20 percent.

And so if I could just quickly, the Bureau of Labor Statistics, which is the statistical arm of the U.S. Department of Labor, contains a bevy of information. And so in addition to that, also the U.S. Census Bureau has data. And I believe one of the pieces of data they have, and they update regularly, is on income distribution in the United States.

And one of the tables clearly shows over time that the top 20 percent of households in the U.S. is taking in an increasing share of all income generated in this country, while the bottom 20 percent of households—and when I say top 20 percent of households and bottom 20 percent I am really talking about by income. So low-income households versus high-earning households, or wealthy households.

Analogously, the bottom 20 percent of households, it is very clearly over the last several decades, is taking in a smaller share of all income that is generated in this country. And so along with looking at the direction of the GINI Index, the statistical evidence

is absolutely clear and undisputable that income distribution is widening, and income inequality is widening in the United States. The evidence is very clear, and it is concrete.

Chairman Beyer. Thank you. And Dr. Parikh, the good Dr. Goodspeed talked about, maybe in response to a question from my friend Mr. Schweikert, that if we want an industrial policy we need to look at Great Britain or France in the 1970s.

What is the difference in terms of our investment and the COMPETES Act, whatever it is being called, the infrastructure bill, in building factories, the doubling of the investment in the National Science Foundation, how is that different?

Dr. Parikh. It is a really important question. And, look, imagine as we were coming out of the pandemic, one of the things that is not talked about—we always talk about the discoveries, and how we got the MRNA vaccine, and other technologies to get vaccines into the field so quickly.

The thing we do not often talk about is the scale up in the manufacturing. The fact that we could go from zero to 300 million doses in a matter of months is actually an equivalent success to the scientific success. That is remarkable. And it is not something that every country can do. And imagine that if instead of meeting the capacity in building and making vaccines we needed, the solution involved semiconductor microchips. We would not have been able to do that. We would have been beholden to other nations to actually get a solution to the pandemic if that were the case.

And there are other areas of our economy that are just that dependent on semiconductor microchips. And we cannot let—we cannot let it be that one of the most critical components of so much of our technology is not actually manufactured here in the United States.

And so it is critically important to have not just the infrastructure to do it, but the workforce to do it. And so the rest of that legislation in the USICA, COMPETES Act is about the funding of the National Science Foundation.

I mentioned several critical areas where we are close to an inflection point. Artificial intelligence, quantum computing, launch systems to low earth orbit. These are places where other nations have seen that we are on that cusp and are investing. And should we invest the same way? Absolutely not. We should do it the American way, which means that we have this wonderful ecosystem that has Federal investment plus industry investment. Industry investment has gotten to around 3 percent of GDP. That is wonderful. The problem is, Federal investment has fallen to about 0.6 percent of GDP. And what that means is we have an imbalance between research and development, and we have got to work on that.

So it is different. It is very different from the industrial policy that is picking winners. It is not about picking winners. It is about looking at which parts of the scientific ecosystem are about to take that exponential burst of industrial activity and placing some bets.

Chairman Beyer. Thank you very much. I would really like to thank all of you. The vote actually did start, so I need to get over to do that. But this is a really interesting, productive conversation on a more equitable economy.

And I appreciate the various charts and interpretations that these are worth fighting over, and trying to understand how best to go forward.

Thanks to the efforts of this Congress and the Biden administration, unemployment is down to 3.6 percent. It is just a tenth above the highlight before the pandemic at the end of the Trump administration. The economy grew at the fastest pace in 40 years. Businesses have hired more workers faster than ever reported. Thirty percent increase in small business applications over the prior record. But we have not escaped the global spike in inflation, and that is hurting an awful lot of families, especially families at the low end. So we need to lower those costs for U.S. workers and we need to advance economic growth and competitiveness and we have to act now to build the capacity of the American people and our economy.

And I think we started that work with the Infrastructure Investment and Jobs Act and the investments to make competition bills are the next step to powering this new era of America's leadership in innovation and technology. The investments we have discussed today will drive inclusive economic growth and put us at the front of addressing complex challenges. And they are complex. And we can do it while strengthening the bargaining power of workers and realigning corporate incentives to reward long-term pro-growth investment that generates society and economy wide returns.

The potential for these investments is exciting. I deeply believe that America's best days lie ahead. There is a better tomorrow for U.S. families, workers, and businesses.

So thank you to each of our panelists for their contributions to this timely and ongoing discussion. And thanks to my colleagues, coming and going, for being a part of this discussion and sharing their insights.

The record will formally remain open for three business days. This hearing is adjourned.

[Whereupon, at 3:48 p.m., Wednesday, April 27, 2022, the hearing was adjourned.]

SUBMISSIONS FOR THE RECORD

PREPARED STATEMENT OF HON. DONALD BEYER JR., CHAIRMAN,
JOINT ECONOMIC COMMITTEE

RECOGNITIONS

This hearing will come to order. I would like to welcome everyone to the Joint Economic Committee's hearing, "Building on a Strong Foundation: Investments Today for a More Competitive Tomorrow."

I want to thank each of our distinguished witnesses for sharing their expertise today. We have an exceptional panel of experts, and I'm looking forward to hearing from them.

OPENING STATEMENT

Just over two years ago, the United States confirmed its first case of COVID.

Since then, hundreds of thousands of lives have been lost, and our Nation has experienced the worst recession since the Great Depression. Virtually overnight, nearly 22 million jobs disappeared and GDP cratered.

The loss of life is a national tragedy, and we mourn those lives that were taken too soon.

Today's hearing will focus on how our country is overcoming the economic effects of the global pandemic and what steps we can take now to ensure our economic health for the long term.

As we convene for this discussion, our Nation's economic rebound has exceeded all expectations. The American Rescue Plan and other pandemic relief, including the successful dissemination of vaccines, have created a remarkably different economic reality than the one we were facing at the start of 2021.

To date, nearly 93 percent of the jobs lost during the pandemic have been regained. The unemployment rate has fallen to just 0.1 percentage points above its pre-pandemic rate. And GDP has reached the fastest pace of growth in nearly 40 years. President Biden has overseen the creation of 7.9 million jobs, and 2021 set a record for the most new businesses started.

Far from guaranteed, the speed and strength of our economic recovery is a direct result of increased public investment. Thanks to the efforts of this Congress and the Biden administration, the United States has experienced the fastest recovery among G7 countries. It remains the only major economy that has recovered to its pre-pandemic trend of economic growth, or what it would have been absent the coronavirus recession.

But the United States has not escaped the global spike in inflation that is denying workers and families the full benefits of the recovery. Global supply chain disruptions have pushed up prices worldwide, and Putin's invasion of Ukraine is exacerbating the effects on energy and food prices.

We, in Congress, have an opportunity to lower costs for workers and families, spur job creation and promote U.S. competitiveness now and for generations to come.

Evidence shows that public investment in research and technology drives innovation and boosts productivity, which is the bedrock of long-term economic growth. Historically, U.S. economic booms have been fueled by investments in science and technology that were initiated and sustained by public funding.

For example, public investments in the Defense Advanced Research Projects Agency helped support the development of the personal computer and the internet. Together, these drove a technological revolution that turbocharged U.S. productivity and radically changed the ways people conduct their lives—not to mention the creation of hundreds of thousands of new jobs.

If a goal of our government is to drive broadly shared economic growth and ensure that the United States remains internationally competitive, public investment is essential to success.

The recently passed bipartisan Infrastructure Investment and Jobs Act is a down payment. It will address years of inadequate Federal investment in critical infrastructure—such as roads, bridges and broadband—to create jobs, enhance productivity and improve supply chain resilience. The economy-wide benefits will reduce long-term inflationary pressures.

Congress should build on this foundation and pass the bipartisan competition bills to drive economic growth and shared prosperity. The investments in innovation, research and manufacturing will boost our economic capacity, create high-quality jobs in communities across the country and raise worker wages. And by promoting increased efficiency among workers and businesses, these investments will also lower costs for everyone.

The bills' focus on racial, gender and geographic diversity in training and education will help ensure communities that have historically been excluded are able to share in the benefits.

We've all experienced the many ways disinvestment in American-made products has contributed to recent supply chain disruptions, and the investments in this legislation will help shore up American supply chains and domestic manufacturing.

TURN IT OVER TO SENATOR LEE

The pandemic shined a new light on inequality in this country and exposed underlying vulnerabilities in our economy that are constricting our collective potential.

We have an opportunity now to lower out-of-pocket costs for families on their biggest household expenses while also paving the way for economic growth in the long term that is stronger, stable and more broadly shared.

As we dive deeper into these issues, I look forward to the testimonies of our expert witnesses. Now I would like to turn it over to Senator Lee for his opening statement.

PREPARED STATEMENT OF HON. MIKE LEE, RANKING MEMBER,
JOINT ECONOMIC COMMITTEE

Before the COVID-19 pandemic, pro-growth policies brought the American economy roaring to life in a way that bigger government and more central control never could.

While the strong economy lifted up all Americans, historically disadvantaged groups benefited the most. Unemployment for Hispanic Americans, Black Americans, and Asian Americans fell to the lowest rates on record. The unemployment rate for women dropped to its lowest level in almost 70 years. And low-income workers saw their wages rise at some of the fastest rates ever recorded.

All told, in the three years leading up to the pandemic, poverty reached an all-time low; real median income increased by almost \$6,000 per household; and the bottom 50 percent of American households saw their wealth increase by over 70 percent. The recipe for this broad-based prosperity was lower taxes and less regulation.

Today, after two years of mandates, subsidies, and 'expert' control, government has all but eviscerated this strong foundation. Americans have been forced to endure governments shuttering their livelihoods, schools, and communities.

Measured against the pre-pandemic trend, 6.6 million workers are currently missing from the workforce. These Americans are missing out on not only the financial rewards of a job, but also the community and purpose that come from work.

In contrast with the pre-pandemic economy that especially benefited low-wage workers and historically disadvantaged Americans, these groups are again falling further behind. With more government getting in the way, middle class and low-wage workers are hurting the most.

Democrats' \$1.9 trillion in partisan spending has ignited the worst inflation in four decades—inflation that is hitting my home state of Utah harder than almost anywhere else. Even if prices were to stop rising tomorrow, Utah families will have to pay nearly \$8,500 this year to afford the same items they purchased at the beginning of the Biden administration, according to the Joint Economic Committee's state inflation tracker.

Meanwhile, school closures have caused devastating learning losses for the youngest and lowest-income students. The Penn Wharton Budget Model estimates that these losses will weaken our productivity and wages for the next 30 years.

Unconditional stimulus checks and explicit anti-work incentives have increased the use of harmful substances at a time of vulnerability for many Americans. Drug overdose deaths are back to an all-time high, and suicides and alcohol abuse have spiked.

Lockdowns have triggered rising crime rates across the country, causing Americans to feel less safe in their communities. The murder rate jumped almost 30 percent in 2020—the largest increase on record.

It's clear that so-called 'investments' from Washington have failed to produce the prosperity the Biden administration promised. And many of the proposals I hear from my colleagues will make our problems worse.

Plans to keep spending money we don't have will pour more fuel on the inflation fire. Tax hikes on businesses will make it harder for Americans to innovate at home and compete abroad. And legislation that takes a cue from China's state-directed economy by federally commandeering research and development is the opposite of what has made us the world's strongest and most prosperous nation. We will never beat China by becoming more like China.

We know what works. Before the pandemic, tax cuts and deregulation supported a thriving economy that benefited families and workers of all walks of life. The free market system that prizes ingenuity and rewards people for using their God-given talents in service of their neighbors resulted in benefits for the Americans who needed it most.

After two years of policies that have assaulted and eroded this strong foundation, I hope we can learn from our mistakes. I hope we've learned that when we choose to remove government barriers to Americans' creativity and freedom, families of all types prosper.

Thank you.

Economic Policy Institute

Written testimony to the Joint Economic Committee for hearing titled “Building a Strong Foundation: Investments Today for a Competitive Tomorrow”.

Josh Bivens, Ph.D.

Research Director, Economic Policy Institute (EPI)

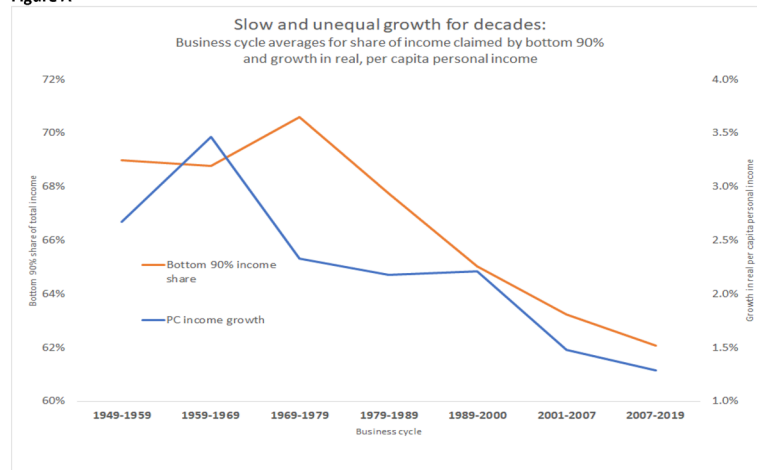
Chairman Beyer, Vice-chair Heinrich, Ranking Member Lee, and all members of the committee, thank you for the opportunity to testify today on “Building on a Strong Foundation: Investments Today for a More Competitive Tomorrow”. My name is Josh Bivens and I am the research director of the Economic Policy Institute (EPI) in Washington, D.C. EPI conducts research and analysis on the economic status of working America, proposes public policies that protect and improve the economic conditions of low- and middle-wage workers, and assesses policies with respect to how well they further those goals. Today I will discuss the importance of public investments for delivering better economic outcomes and greater security for these low- and middle-income families. My main points are:

- Before the pandemic struck, economic growth in the United States was too-slow and too-unequal for decades. This was largely due to a series of intentional policy choices that shifted bargaining power away from workers and towards capital-owners and corporate managers, and which ramped-down crucial public investments.
- Because the fiscal policy response to the pandemic recession was far more ambitious this time than during past economic crises, the recovery has been far stronger.
- However, stabilizing the economy quickly after a shock is just a necessary, not a sufficient, condition for reversing the slow and unequal growth of recent decades. A full reorientation of policy to significantly boost incomes and economic security for the vast majority requires continued public investments in both infrastructure and people.
- Blocking these investments in the name of fighting the recent rise in inflation makes no sense from either an economic or a policy perspective.
 - Fighting inflationary surges by throttling back demand growth is not a job that Congress is nimble-enough to do. That’s why the Federal Reserve is the nation’s first line of defense against inflationary surges.
 - Most recently proposed public investment packages are not fiscal stimulus. The spending is spread out over a long period of time and is fully paid-for. These investments will hence not be inflationary.
 - The evidence linking the inflation of 2021 and early 2022 to “overheating” caused by too-generous fiscal relief passed in early 2021 is exceedingly weak.
- Going forward, both the fiscal response to the COVID-19 shock and further federal investments will make future inflationary outbreaks like we’ve seen in the past year far less likely. The past year’s inflation has its roots in past policy failures – most conspicuously the failure to invest enough both in fighting recessions with proper force and in building up the nation’s full productive capacity.

Growth was too-slow and too-unequal in the pre-pandemic period

By now, most know about the rapid rise in inequality in the U.S. economy that occurred after 1979. What they might know less about is how tightly linked this rise in inequality is to slowing *overall* growth. **Figure A** charts the share of income claimed by the bottom 90% of households in the United States and growth in real (inflation-adjusted) per capita personal income. It shows the average of both measures over full business cycles to show structural trends. The upshot of this should be clear – economic growth in the U.S. before the pandemic hit was already too-slow and too-unequal.

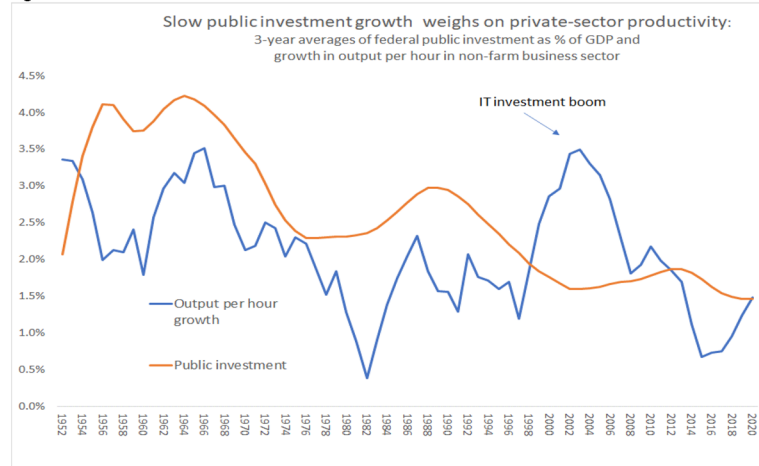
Figure A



Note: Data on growth in real per capita personal income from the National Income and Product Accounts (NIPA) of the Bureau of Economic Analysis (BEA). Data on bottom 90% income share from the Distributional National Accounts data maintained by Gabriel Zucman at: <https://gabriel-zucman.eu/usdina/>

Both the rise in inequality and the slowing of growth have complicated and multi-faceted causes. But part of the slowdown of overall growth can be linked to a steady and significant decline in federal public investment. **Figure B** shows this federal investment as a share of gross domestic product (GDP) and the growth rate of productivity (or real output produced in an hour of work) in the non-farm business sector. Public investment has declined steadily since the 1970s, and its decline is associated with declining productivity growth. The one period that saw a productivity surge without an increase in public investment is the late 1990s and early 2000s. But this surge is easy to explain and unlikely to be replicated: it resulted from a very large investment effort to hook the nation's business sector to the Internet, with investments in information and communications technologies (ICT) rising by more than 40% in some years. Once this big push was accomplished, productivity growth drifted back down to its post-1979 norm (and even below for a time).

Figure B



Note: Data on public investment from the BEA Fixed Assets program. Data on output per hour in the non-farm business sector from the Bureau of Labor Statistics major sector productivity and costs program, accessed through FRED from the Federal Reserve Bank of St. Louis.

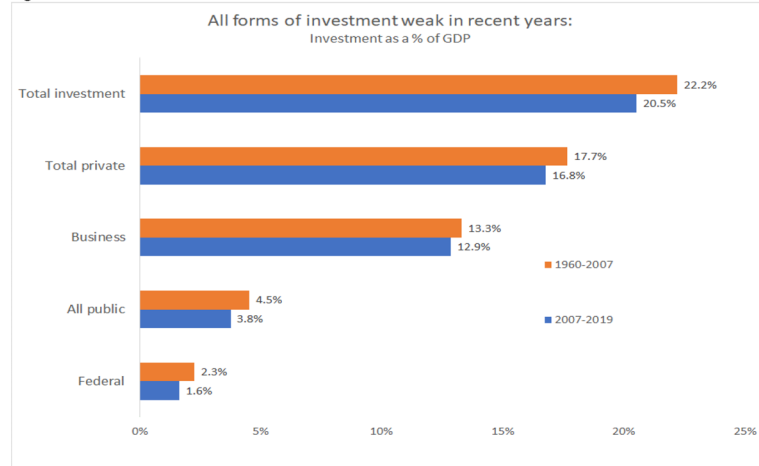
The association in the figure is supported by more-detailed econometric studies, which find the contribution to economic growth stemming from public capital to rival or exceed the contributions made by private capital.¹ This is particularly important because *all* forms of investment (both private and public) have faltered badly in the past 15 years. **Figure C** below shows the average of investment as a share of total GDP by various types between 1960 and 2007 (1960 is the first year that disaggregated data is available) and over the 2007-2019 business cycle. Overall, investment is down by 1.7% of GDP in the latter period, and private and public investment each contributes almost exactly half to this shortfall.² Both sides – public and private – should be addressed by policymakers. But, while there are some policy tools available to induce private businesses to invest more, the most direct way for policymakers to reliably the nation's capital stock is simply to undertake a greater scale of public investments.³

¹ See Bivens, Josh (2019) "[The potential macroeconomic benefits of investing in infrastructure](#)", Economic Policy Institute for a review of much of this evidence. The average output elasticity of output with respect to public capital identified in that review rivals what is generally identified as the elasticity of output with respect to private capital. Vollrath (2021) "[The elasticity of aggregate output with respect to capital and labor](#)", for example, finds that including public capital increases estimates of this elasticity.

² Just to be clear – 1.7% of GDP is a large number. In dollar terms it is roughly \$400 billion.

³ The weakest tools to boost investment are tax cuts and broad-based assaults on federal regulations. On the weakness of corporate income tax cuts as a measure to boost investment, see Brun, Gonzalez, and Montecino (2022), "[The aggregate and distributional consequences of capital taxation](#)". On the weakness of regulatory rollback as a strategy for boosting investment, see Eberly, Janice (2011), "[Is regulatory uncertainty holding back](#)

Figure C



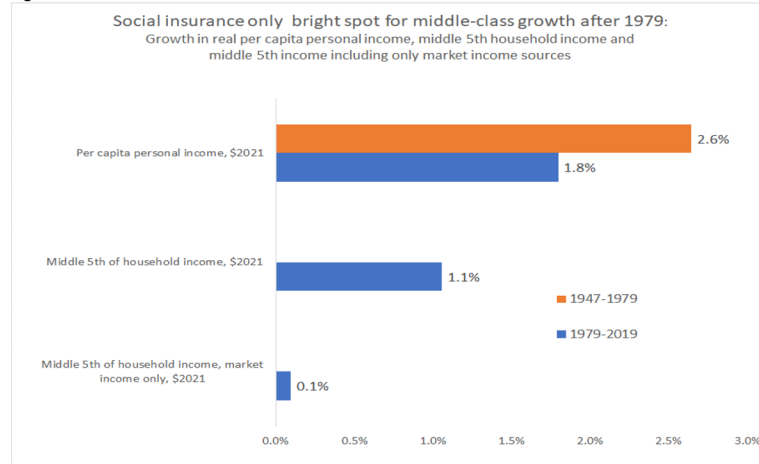
Note: Data from BEA NIPA table 5.1

Some of the legacies of past ambitious efforts to boost federal investments in families' economic security – like Social Security, Medicare, and Medicaid – were some of the only bright spots for boosting income growth broadly in the post-1979 period. **Figure D** shows growth in overall real per capita personal income, growth in income for households in the middle 20% of the income distribution, and growth for these households in market-based incomes only. The top two bars again highlight the rapid decline of growth in overall personal incomes since 1979. The next two bars highlight that growth for the middle-fifth of households lagged far behind this overall growth – the definition of rising inequality. Perhaps most strikingly, if families in the middle-fifth only had market-based incomes to rely on over this time-period, then their incomes would have been essentially stagnant (growing at just 0.1% annually).⁴

[job-growth](#)". An underrated strong tool for boosting business investment is consistently running high-pressure labor markets to induce businesses to invest in labor cost-saving measures. See Bivens, Josh (2017), "[A 'high-pressure' economy can help boost productivity and provide more 'room to run' for the recovery](#)". A range of measures like direct regulation or market-based measures to price the emissions of greenhouse gases or subsidies to induce the purchase of energy-efficient goods and services could likely go a long way to inducing private-sector investment in these areas.

⁴ "Market-based" incomes essentially include wages and salaries, dividends, rental payments and other private income flows, but exclude transfer payments from government like Social Security, Medicare, Medicaid, unemployment insurance or other social insurance or means-tested transfers.

Figure D



Note: Data on real growth in per capita personal income from the BEA NIPA data. Data on growth in middle-fifth household incomes (market and post-tax/transfer) from the Congressional Budget Office data on the distribution of household income, maintained here: <https://www.cbo.gov/publication/57061>

Recovery from the COVID-19 economic crisis has been far more rapid

In 2007, the last year before the Great Recession, the unemployment rate hit a business cycle low of 4.3%. It did not re-attain this level until a full decade later, in 2017. This is 10 years in the careers of U.S. workers that were hamstrung by the failure of policymakers to take effective measures to push the economy closer to full employment.

The most-glaring failure was excessively austere fiscal policy. Had public spending following the Great Recession followed the same trajectory it undertook in the early 1980s recovery, for example, the 4.3% unemployment of 2007 would have been re-attained at least *four years earlier*.⁵ In short, just matching previous performance would've cut the time in half when U.S. workers had their livelihoods hampered by a weak economy.

Following the COVID-19 economic crisis, fiscal policy was made far more supportive of recovery. The fruits of this different approach can be seen in **Figure E**, which shows the trajectory of economy-wide employment over the course of the Great Recession, the COVID-19 recession, and associated recoveries. After the much-larger fall during the COVID-19 recession, the upward slope of employment in the recovery is far steeper following the COVID-19 shock. This much

⁵ For documentation of the role of fiscal austerity in prolonging elevated unemployment, see Bivens, Josh (2016), "[Why is recovery taking so long – and who is to blame?](#)".

more-rapid recovery is not accident, it is due directly to fiscal policy being *far* more supportive of recovery efforts this time around.⁶

Figure E

Federal fiscal relief at the scale of the problem led to a faster recovery from the pandemic recession

Private-sector employment change since business cycle peak, December 2007 and February 2020



Source: EPI analysis of Bureau of Labor Statistics' Current Employment Statistics public data series.

Economic Policy Institute

Continued public investment is needed – and inflation is no reason to block it

The more-rapid pace of recovery documented in **Figure E** above is a huge policy victory. Allowing labor market damage inflicted by recessions to fester for years without pushing the economy quickly back to full employment has been a key contributor to all sorts of economic dysfunction in recent decades. To take just one example, in a recent study we undertook to identify the policy levers contributing to the anemic pace of wage growth for the large majority of U.S. workers in recent decades, the single biggest contributor was the failure to consistently maintain tight labor markets with low unemployment and plentiful job opportunities.⁷

But stabilizing the economy much more-quickly after an adverse shock is just a necessary, not a sufficient, condition for reversing the slow and unequal growth we highlighted before. Given the contribution that strong public investments make to overall growth (**Figure B**) and to the ensuring the fruits of growth are shared more equitably (**Figure D**), they need to be a key part of how the nation doesn't just emerge from the pandemic recession, but emerges with a stronger and fairer economy going forward.

⁶ The job-creation advantage of the current recovery is even more pronounced if one focuses solely on private-sector employment, as public employment has suffered disproportionately during the COVID-19 economic crisis.

⁷ See Bivens, Josh and Lawrence Mishel (2021), "[Identifying the levers generating wage suppression and wage inequality](#)".

Some have argued that the burst in inflation in the past year argues against the desirability of making such investments. This argument makes no economic sense and deeply misunderstands the proper division of labor among macroeconomic policymakers.

Fiscal policy is a weak and unreliable tool for restraining inflation

That main reason Congress should not see itself as responsible for dampening outbreaks of inflation is that they are just poorly equipped to do it institutionally. Put simply, fiscal policy is nowhere near nimble-enough to respond to relatively sudden bursts in inflation. By the time Congress recognizes the burst, debates the proper response, compromises on a bill, navigates its signing by the President, and then sees the policy effects hit the economy, the inflationary shock is likely to be past and the policy might well restrain growth just as the economy is already slowing. These considerable lags are a key reason why the Federal Reserve is given the primary job of restraining inflation through throttling back on demand growth if that's what's needed to fight inflation (whether or not that *is* currently needed is debateable – which I'll say a bit more about below).

Given that the excessively austere fiscal policy following the Great Recession has just been noted, it's also worth noting a deep inconsistency in how too many in Congress see their role in macroeconomic stabilization now versus then. There is no advantage that Congress has over the Federal Reserve in *restraining* demand growth to tamp down inflationary pressures. But, there actually *was* a large advantage that Congress had over the Federal Reserve in boosting demand and spurring faster recovery from the Great Recession: the Fed's main policy tool was ineffective during that time. The Fed generally cuts interest rates to spur faster recovery, but, by 2008 the interest rate they directly control had already hit zero and could not be cut any further.

This collision with the “zero lower bound” on interest rates argued strongly that fiscal policymakers should have stepped in to help pull the economy out of its depressed state.⁸ A key indicator that such strong fiscal medicine was needed was inflation that was far below the Fed's preferred target – a shortfall that essentially lasted a full decade. Yet during the time when fiscal policy really could have helped solve a pressing problem of macroeconomic stabilization, was there a groundswell in Congress to weigh in then and restore the inflation rate to its proper target? There was not.

Failing to act *then*, and yet demanding action *now* to restore inflation to its proper rate is the kind of policy asymmetry that has harmed the U.S. economy for decades. For some reason, a surge of inflation above its target is seen as a spur to Congressional action – even when their tools for addressing it are weak and unreliable and the Fed's tools are strong. And yet a period of extended and damaging excess unemployment was not such a spur – even when fiscal policy tools for addressing it were strong and reliable and the Fed's tools were weak.

Investments being debated today are not stimulus and will not be inflationary

Since the passage of the American Rescue Plan (ARP) in early 2021, subsequent proposals for increased federal investments have drawn criticism for potentially adding to the “overheating” of the economy and putting upward pressure on inflation. But, proposals since ARP – whether

⁸ For the technical argument why more-expansionary fiscal policy would have been extraordinarily helpful during that time, see DeLong, Brad and Lawrence Summers (2012), “[Fiscal policy in a depressed economy](#)”.

passed (like the Infrastructure and Investment Jobs Act (IIJA)) or still under debate – are quite unlike the ARP and hence would be extremely unlikely to spur inflationary pressures. Most importantly, the ARP really was meant to be fiscal stimulus – it was intentionally designed (appropriately so, at the time) to be extremely front-loaded in how quickly the money was disbursed. Of the \$1.9 trillion overall cost of ARP in the 10-year budget window, more than 70% was disbursed in the first year. For IIJA, less than 10% will be disbursed in the first year. And even the now-stalled Build Back Better proposals saw just over 5% of the total 10-year budget window spending set to hit the economy in the first year. Again, these post-ARP proposals have not been aimed at providing fiscal *stimulus*, but at providing steady and long-lived public investments.

Equally as important, many of these proposals include substantial revenue provisions that would make them either deficit-neutral or even deficit-reducing.⁹ Many of these revenue provisions are good policy in and of themselves, and they would also ensure that the near-term stimulative effect of the overall public investment plans was not inflationary.

In essence, current proposals that are long-lasting and paid-for would solve pressing social problems (like slow and unequal growth) by slightly increasing the public sector footprint in the U.S. economy. But there is no relation at all between measures of the simple size of the public sector and inflation. **Figure F** below, for example, shows that recent inflation accelerations have if anything been smaller in countries with a larger public sector. This figure also highlights how limited the size of the public sector in the United States is relative to advanced country peers. In 26 countries with comparable inflation data to the U.S., only Lithuania, Switzerland, and Ireland have smaller shares of general government spending in the economy (and the Irish measure is likely quite non-comparable¹⁰).

Evidence linking recent inflation to too-generous COVID-19 fiscal relief is weak

Despite the huge quantitative and qualitative differences between the ARP and subsequent proposals for public investment, many continue to insist that the ARP is the root cause of recent inflation and hence any further fiscal policy interventions should be blocked in the name of reining in this inflation. These arguments rest on extraordinarily flimsy evidentiary grounds. For one, across countries there is no significant correlation at all between the size of fiscal policy responses to COVID-19 and the inflation of acceleration in the past year. As shown below in **Figure G**, if anything the correlation is negative, but it's essentially trivial either way.

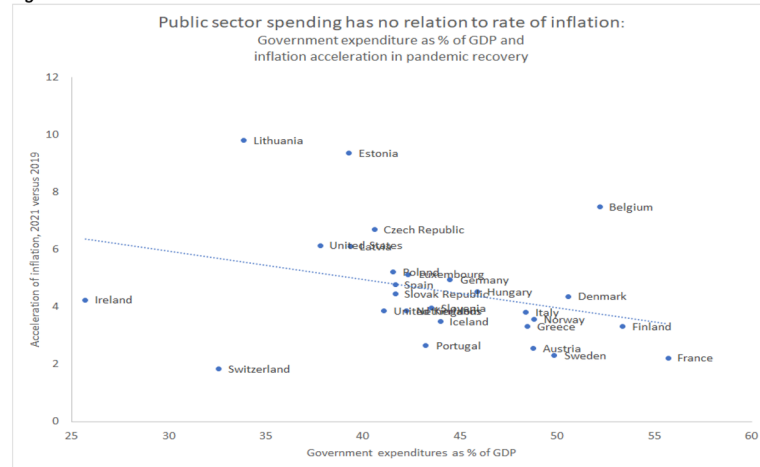
There is, however, suggestive evidence consistent with a hypothesis that it is not fiscal stimulus driving inflation, but is instead simply the persistence of COVID-19 related economic distortions. In the same 26 countries examined in **Figures F** and **G**, the acceleration of inflation in 2021 is

⁹ For an excellent overview of many of these revenue proposals, see Chye-Ching Huang's testimony before this committee in October 2021, "[Written Testimony for Hearing, 'Building Back Better: Raising Revenue to Invest in Shared Prosperity'](#)"

¹⁰ The extraordinarily large presence of foreign multinationals (particularly pharmaceutical and tech companies domiciled there largely for reasons of tax evasion) in Ireland boost their gross *domestic* product substantially over gross *national* product. But because an extraordinarily large share of the income generated by these multinationals is repatriated each year to shareholders, it provides little benefit to Irish residents, and hence GNP is likely a better measure of Irish welfare than GDP, unlike for many other countries.

faster (6.3%) in countries with above-average cumulative COVID-19 cases over that time than in countries with below-average cases (where the inflation acceleration has been 4.6%).¹¹

Figure F

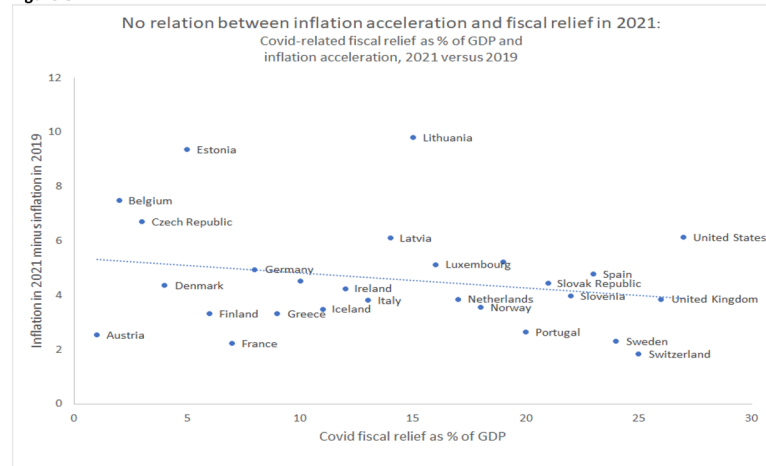


Note: Data on inflation is the harmonized consumer price index data from the Organization for Economic Cooperation and Development (OECD). To measure recent inflation acceleration, we subtract the percent growth in prices from December 2018 to December 2019 from (annualized) percent growth between December 2020 and February 2022. Data on general government expenditures as a share of GDP from the stats.oecd.org database.

Finally, we should note that the larger hypothesis that recent inflation has been driven clearly by macroeconomic overheating (whether spurred by the ARP or not) lacks crucial evidence as well. For example, the main channel through which economic overheating is generally thought to drive inflation is through wage growth that matches (or even exceeds) the sum of inflation and economy-wide productivity, leading to wage-price spirals. Over the past 40 years, the evidence is unambiguous that tighter labor markets lead generally to real wage *increases*, not losses, and other strong evidence indicates that the labor share of income should rise when labor markets tighten. This pattern is the opposite of what we have seen so far in the current recovery.¹²

¹¹ For the economic channels running from the pandemic distortions to a burst of inflation beginning in 2021, see Bivens, Josh (2022) ["Inflation and the policy response in 2022"](#).

¹² For longer versions of this argument, see Bivens, Josh ["Corporate profits have contributed disproportionately to inflation: how should policymakers respond?"](#) and Baker, Dean ["If wage growth is driving inflation, why is workers' share of income falling?"](#)

Figure G

Data on inflation is the harmonized consumer price index data from the OECD. To measure recent inflation acceleration, we subtract the percent growth in prices from December 2018 to December 2019 from (annualized) percent growth between December 2020 and February 2022. Fiscal relief in response to Covid-19 from the International Monetary Fund Database of Fiscal Policy Responses to COVID-19, maintained at: <https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>

Price growth in the current recovery has not been driven by excess wage growth stemming from an overheated labor market, but has instead been driven by a hugely disproportionate contribution of corporate profits to costs. So long as growth in nominal wages falls short of price inflation plus productivity growth, then labor costs actually are dampening, not amplifying, inflationary pressures.¹³

One way to see this lack of inflationary pressure coming from the labor market is to compare price growth and wage growth across detailed industries. **Figure H** below highlights the very loose correlation between these measures through February 2022. Industries with exceptionally rapid price growth are not those with rapid wage growth and vice-versa. Until the vicious cycle begins where wage growth begets price growth which begets further wage growth, evidence that the economy has overheated due to a macroeconomic mismatch of supply and demand seems quite weak.

¹³ For a fuller explanation of the relationship between nominal wage growth and inflation, see Bivens, Josh "A vital dashboard indicator for monetary policy: Nominal wage targets".

Figure H

Data on industry-level price inflation from the BLS Producer Price Index (PPI) program. Data on industry-level wage growth from the Current Employment Statistics (CES) payroll survey. For both measures, percent growth from December 2018 to December 2019 is subtracted from percent growth from February 2021 to February 2022.

Conclusion

Before the pandemic hit, the U.S. economy generated growth that was too-slow and too-unequal. Both of these problems were the result of intentional policy decisions that disempowered U.S. workers and invested too little in public goods and the economic security of typical families. This same disinvestment also left the nation's infrastructure poorly prepared to absorb a large but temporary increase in durable goods demand without mammoth supply-chain failures. Further, past failures to effectively fight recessions and restore full employment quickly left U.S. employers convinced that customers would be scarce but workers abundant in the first few years following any recession. Given this expectation, these same employers have been caught completely flat-footed by a strong recovery where customers are abundant but workers scarce.

These problems call out for serious fixes, and a new program of public investment that helps make growth faster, more equal, and more resilient to shocks is one such serious fix. If we define the pressing economic problems facing U.S. families today as only restoring inflation to more-familiar levels in the coming year, we will be setting the bar for success far too low and will simply repeat the policy mistakes of recent decades.

**Testimony by Michelle Holder before the Joint Economic
Committee**

Michelle Holder
Washington Center for Equitable Growth
Testimony before the Joint Economic Committee,
Hearing on “Building on a Strong Foundation: Investments Today for a More Competitive
Tomorrow”

April 27, 2022

Introduction

Thank you, Chair Beyer, Ranking Member Lee, Vice Chair Heinrich, and members of the Joint Economic Committee, for inviting me to speak today. It’s an honor to be here virtually.

My name is Michelle Holder. I am the president and CEO of the Washington Center for Equitable Growth, an organization that seeks to advance evidence-backed ideas and policies that promote strong, stable, and broad-based economic growth. I also serve as an associate professor of economics at John Jay College, which is part of the City University of New York.

Since 2013, Equitable Growth has provided more than \$7 million in grants to more than 300 researchers aiming to understand how economic inequality—in all its forms—affects growth and stability. The evidence demonstrates that the decades-long trend of increasing inequality hurts both families and the long-term trajectory of the U.S. economy.

Crucially, this trend is not the result of natural, iron laws of economics. Rather, increasing inequality is the result of a long history of policy decisions that have prioritized ideology over evidence. Making different policy decisions—such as robust government investments—can help reverse inequality and make our economy stronger and more resilient.

In what follows, I will detail how the federal government has already begun to make these different policy choices during the current economic recovery from the COVID-19 recession. I will then focus on two key areas where government investments can build on the foundations of the recovery and play a critical role in promoting economic growth that can be shared by all—the manufacturing sector and green energy, with particular attention to manufacturing’s past and green energy’s future. As I will demonstrate, investments in both of these sectors are vital for promoting racial equity and boosting economic growth.

Indeed, the costs of inaction are severe. Mary Daly—president and CEO of the Federal Reserve Bank of San Francisco—and colleagues [examine](#) differences from 1990 to 2019 among White, Black, and Latinx men and women ages 25 to 64, and find if economic outcomes and opportunities were more equitably distributed, nearly \$23 trillion would be added to the U.S. economy. Further, [writing for Equitable Growth](#), Robert Lynch of Washington College finds that closing racial and gender disparities would result in an increase in U.S. Gross Domestic Product by \$7.2 trillion and would have totaled \$28.6 trillion instead of \$21.4 trillion in 2019.

Lynch also finds that federal, state, and local tax revenues would have been \$1.82 trillion higher in 2019 while the overall U.S. poverty rate would have dropped from 10.5 percent to 6.6 percent, lifting 12.2 million people out of poverty in 2019. What's more, there would have been a \$429 billion improvement in the finances of the U.S. Social Security system in 2019.

Government investments are an essential tool for helping to attenuate these disparities and are therefore an essential tool for strengthening our economy. We need to look no further than the present moment to understand the powerful role that government investments can play.

A strong recovery

The COVID-19 recession was quite unlike business cycle downturns of the past. When the pandemic began to spread across the United States in March 2020, its impact was immediate and severe. The [U.S. unemployment rate skyrocketed](#) from a 50-year low of 3.5 percent in February 2020 to a post-Great Depression high of 14.7 percent in April of that same year. Over the same period, the U.S. labor market [shrank by more than 20 million jobs](#). Industrial production [plummeted](#). And the U.S. economy [contracted by 3.4 percent](#) in 2020—the worst economic downturn since 1946. Job losses did not closely follow patterns from past recessions.

The COVID-19 recession also entrenched disparities in U.S. labor market outcomes for women of color, especially Black women. As my colleagues Janelle Jones, former chief economist of the U.S. Department of Labor, Thomas Masterson of the Levy Institute, and I [find](#), Black women were bearing the brunt of early job losses during the pandemic. This was primarily due to occupational segregation. That is to say, there exists an overrepresentation of Black women in certain industries and occupations as a result of a myriad of factors, including the systemic devaluation of certain kinds of work, discrimination, and uneven occupational integration.

Even prior to the pandemic, Black women experienced significant occupational segregation, with five occupations accounting for more than half of all the jobs in which Black women work. This is consistent with a large body of [economic literature](#) that shows women, including Black women, tend to be crowded primarily in low-wage occupations. My colleagues and I find that this already-high occupational segregation worsened during the pandemic and ensuing recession.

The extraordinary nature in which economic activity was slowed or halted—particularly among the kinds of service-sector and care jobs that could not be performed remotely—disproportionately affected Black women precisely because they were more likely than many other demographic groups to be employed in these service and care occupations. More than half of all employment losses for Black women were concentrated in just four occupations in which women, generally, are crowded.

The COVID-19 recession therefore reflected and reproduced existing occupational segregation, leading to disparate U.S. labor market outcomes and uneven job losses. At the onset of the pandemic, occupational segregation by race and gender all but ensured that the COVID-19 economic decline was not equally shared.

Nevertheless, the unprecedented recession was met with an unprecedented recovery. In the 2 years that followed, the U.S. government enacted major pieces of legislation to respond to dual health and economic crises. The COVID-19 recession officially ended in April 2020, but the federal policy response extended well into 2021 to ensure a robust economic recovery. By the end of 2021, real U.S. GDP annual growth hit [5.7 percent](#).

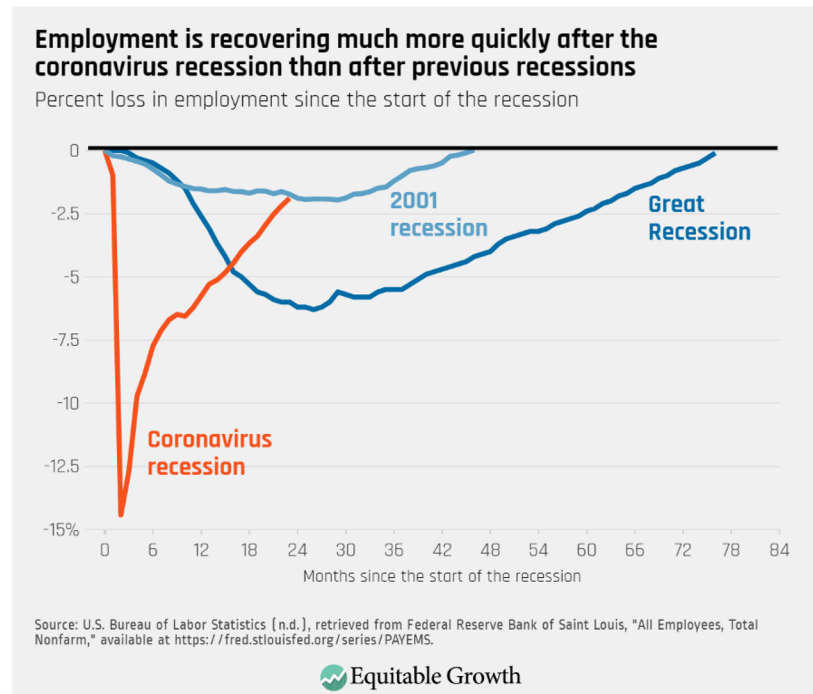
Between March and April 2020, the U.S. Congress passed four major pieces of legislation, the most consequential of which being the Coronavirus Aid, Relief, and Economic Security Act. The CARES Act included provisions to expand eligibility and provide extra support to workers through the Unemployment Insurance system, additional funding for food assistance through the Supplemental Nutrition Assistance Program, loans and guarantees for small businesses through the Paycheck Protection program, and Economic Impact Payments.

The next year followed with the American Rescue Plan, signed into law in March 2021. It included an extension of many CARES Act programs, as well as new initiatives such as the expansion of the Child Tax Credit. The unprecedented speed and size of the American Rescue Plan and the CARES Act helped millions of workers and households withstand the economic pain brought on by the COVID-19 pandemic.

The bounce back in GDP, for example, [was much quicker in the United States](#) than in most other high-income countries. The overall average unemployment rate is now close to its [pre-pandemic level](#). And workers in the bottom of the wage distribution have been [experiencing real wage growth](#). Labor demand has skyrocketed, giving workers more power to negotiate higher pay and better working conditions.

As such, job openings in the United States reached a record high of [11.1 million](#) in July 2021—an almost 60 percent increase from February 2020—and have remained elevated since. The jump in open positions has been particularly stark in industries such as manufacturing and leisure and hospitality. Indeed, the recovery in overall employment has been extraordinarily quick, compared to previous U.S. economic downturns. (See Figure 1.)

Figure 1

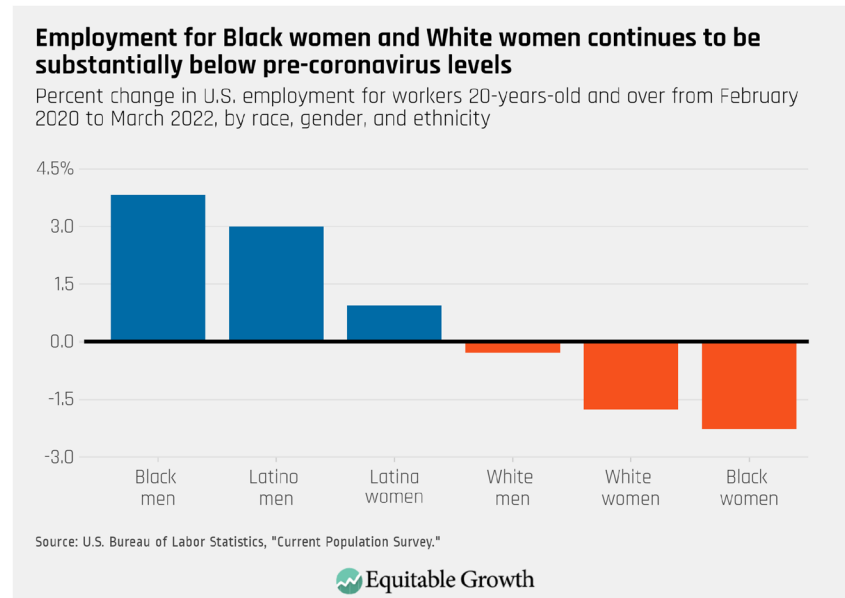


One of the more powerful policies that came from the federal government's response was the expansion of the Child Tax Credit. By providing families with monthly income support to supplement their own earnings and help offset rising prices, the enhanced credit lifted an estimated [3.7 million children out of poverty](#). It also helped reduce racial disparities in household income, as poverty rates fell drastically for [Black and Latinx children](#). This type of policy is a clear blueprint for success.

While inequities in the U.S. labor market remain persistent, employment gains made by Black women and Latina workers suggest the recovery efforts are reaching those who are often the last to recover from a recession at a much quicker pace than [previous recessions](#). The fiscal response to the COVID-19 pandemic is directly responsible for the swift recovery we're experiencing today. With economic growth still strong, there exists a real opportunity to continue to make

government investments to ensure the recovery is not just strong, but also equitable and thus more enduring. (See Figure 2.)

Figure 2



Manufacturing

The government investments fueling the recovery from the COVID-19 recession represent just one potential pillar for promoting a stronger and more resilient economy. Government investments in the manufacturing sector represent another.

It is well understood that investments in manufacturing played a large role in driving U.S. economic growth in the 20th century. The period of the highest rates of annual economic growth was during World War II—peaking at 18.8 percent in 1941—when the government had a considerable and essential hand in planning [industrial policy](#). Yet three key elements of this story are often overlooked.

First, government investments in manufacturing had a significant role in expanding economic mobility for the U.S. population. Second, the gains accruing to Black workers as a result of this transformation were short-lived, attenuated in future generations by racist policies that prioritized policing over social infrastructure. Third, the widely reported loss of jobs in the manufacturing sector in the 1990s and beyond had racially disparate effects, especially in the Black community. I will briefly unpack each of these key elements in turn.

During World War II, the U.S. government financed an industrial expansion that resulted in a threefold increase in manufacturing output over 4 years. Economists Andrew Garin of University of Illinois at Urbana-Champaign and Jonathan Rothbaum of the U.S. Census Bureau examine the effects of these government investments in manufacturing plants on mobility in the postwar period. They [find](#) that in U.S. counties where these plants were built, employment rose by 30 percent and average production wages rose by 10 percent after the war, with both remaining elevated through 2000.

They also find that in places where these plants were built, upward intergenerational household income mobility for children born to parents with below-median family incomes in 1940 increased. By helping support better-paying jobs, these investments proved to be a critical factor in achieving economic mobility for some workers.

Manufacturing also has historically been a sector that provides the dual benefit of economic mobility for Black male and Latino workers without a college degree and a driver of productivity growth for the overall U.S. economy. From 1910 through 1970, more than 6 million Black Americans migrated from the South to Northern, Midwestern, and Western states during what is known as [the Great Migration](#). The period of 1940 to 1970 was particularly stark, with more than 4 million Black Americans migrating during this time.

The drivers behind the Great Migration are myriad, including attempts to escape the overt racial violence of the Jim Crow South and seeking economic opportunity in Northern industrial cities. [As explained by](#) historian Joe William Trotter Jr. of Carnegie Mellon University, from the beginning of World War I through 1930, Black workers increased from 600 in the auto industry to nearly 26,000, from 17,400 to 45,500 in the steel industry, and from 5,800 to 20,400 in the meatpacking industry.

Due in part to the expanding employment in the industrial and manufacturing sectors, some Black workers referenced Northern, Midwestern, and Western cities in terms such as “Promised Land,” “New Jerusalem,” “Land of Liberty,” “Land of Hope,” or “land of milk and honey.” The economic data suggest this conceptualization of economic mobility was partially true, at least for a moment. Economist Leah Boustan of Princeton University highlights that some [estimates](#) indicate Black agricultural workers migrating from the Southern United States who switched to

an industrial occupation in the North were able to increase their earnings by as much as 300 percent. Using cutting-edge empirical research, Boustan finds that when accounting for standards and costs of living, a Black man from the South could have increased his earnings by 130 percent by moving North in 1940.

And yet these increased earnings did not necessarily translate into long-term gains. [In a working paper](#), Princeton University economist Ellora Derenoncourt finds that while the first generation of migrants profited from a mass exodus from the South, the gains they accrued and hoped to pass on to their children were slowly eroded for several reasons, especially related to Northern White civil society backlash to the Great Migration. In the wake of the Great Migration, Northern cities funneled public funds toward policing while investment in social infrastructure stagnated. Simultaneously, White flight to the suburbs and an overall erosion of the urban environment helped transform destination metropolises of the 1940s and 1950s into highly segregated opportunity deserts by the 1990s and 2000s.

Moreover, despite economic gains made during the Great Migration, Carnegie Mellon's Trotter highlights the discriminatory working conditions that Black workers still faced during this time, with managerial and labor policies ensuring the racial stratification of the workforce. Steel industry supervisors, for example, arbitrarily fired Black workers and replaced them with White workers. One Detroit automaker [proclaimed](#), "We hired them [Black workers] for this hot dirty work and we want them [to stay] there. If we let a few rise, all the rest will become dissatisfied."

When recognizing the historical importance of the manufacturing sector for providing a path for upward mobility—with increased wages in union jobs—it is equally important to recognize the structural and policy factors maintaining racial stratification and limiting mobility.

Nevertheless, manufacturing remains an important sector in which to invest because of its pathways for mobility and clear effects on economic growth. A recent Economic Policy Institute [report](#) finds that Black, Latinx, Asian American and Pacific Islander, and White workers without a college degree all earn substantially more in manufacturing than in nonmanufacturing industries. For median-wage, non-college-educated employees, Black workers in manufacturing earn \$5,000 more per year—or 17.9 percent more—than in nonmanufacturing industries. Latinx workers earn \$4,800 more per year, or 17.8 percent more. AAPI workers earn \$4,000 more per year, or 14.3 percent more. And White workers earn \$10,100 more per year—29 percent more than in nonmanufacturing industries.

This "manufacturing premium" is due in large part to [higher rates of unionization](#) in the manufacturing sector, which help to correct for artificially suppressed wages brought on by employers' power to underpay workers. In a separate [report](#), Lawrence Mishel of the Economic Policy Institute finds that, relative to other sectors, manufacturing workers have a benefits

advantage, primarily in insurance and retirement benefits, and this advantage, in fact, increased from 1986 through 2017.

The problem is, [manufacturing employment](#) in the United States has been steadily declining for decades, and productivity in manufacturing has been [slowing](#). The decline in manufacturing has been stark and its effects have been uneven. Economist Eric Gould, [writing for The Centre for Economic Policy Research](#), finds that the decline in manufacturing between 1960 through 2010 led to a significant decrease in wages and employment for Black workers and a significant increase in racial gaps for labor market outcomes. The deterioration in high-paying jobs in the manufacturing sector, especially for men with less formal education, is substantial. Gould’s findings include a 13.3 percent decline in mean, full-time wages for Black men, an increase in the poverty rate of 8 percentage points for Black women, a 9 percentage point increase in poverty for Black children, a 12 percent increase in the racial wage gap for men, and a 3.4 percentage point increase in the racial gap in male employment.

[Research also indicates](#) that declines in manufacturing partially explain decreases in Black employment rates. Economist William Spriggs and his co-authors [find](#) that trade policies causing significant reductions in U.S. manufacturing employment disproportionately affected Black workers. In assessing the industries most exposed to these trade policies, such as manufacturing, they find a 3.2 percentage point reduction in the share of overall Black working-age employment (ages 15 to 64) for every 1 percentage point increase in import exposure.

The decline of U.S. manufacturing has led to both a decrease in the quantity and the quality of manufacturing jobs. This is due to a myriad of factors, including rising contingent work in manufacturing, anti-union “right-to-work” laws in locations with significant manufacturing in the South, and vulnerability to demand shocks. Further, research suggests that in recent decades, employers have used [automation technologies](#) in manufacturing and other industries not to increase productivity, but rather to de-skill jobs and lower wages.

Promoting job quality and worker power as a cornerstone of the manufacturing sector is critical to ensuring that previous benefits of a robust manufacturing sector are realized in the contemporary economy. Bolstering protections and pathways for labor organizing, such as the measures included in [the Protecting the Right to Organize Act](#), will help ensure manufacturing includes worker voices on technological integration, support the connection between workforce training and employment, and ensure workers are sharing in the value that they create. Trade unions, for example, are effective partners in providing apprenticeships, continuing training, and portable benefits.

Government investments in “[high-road](#)” [supply chains](#)—that is, supply chain networks that collaboratively aim to benefit firms, workers, and consumers alike and, crucially, that do not

suppress wages to compete—can help embolden worker power and stimulate broadly shared growth. Economist Susan Helper of Case Western Reserve University, writing for *Equitable Growth*, [argues](#) there is clear precedent for these kinds of investments. The U.S. government can act as a high-road purchaser and preferentially buy from companies that are innovative—as it did to [jumpstart](#) the semiconductor industry. The federal government also can require its suppliers to pay “prevailing wages,” as is required in government-funded construction by the [Davis-Bacon Act](#)—a requirement that helps support apprenticeships and training centers.

Government investments also could include offering technical assistance to its own and others’ suppliers by expanding the Manufacturing Extension Partnership, which provides technical support for small and medium-sized manufacturers, and the U.S. Department of Energy’s Industrial Assessment Centers, which help firms redesign their operations to conserve energy. Furthermore, investments in robust supply chains may also help [curb inflation](#) by helping to ease bottlenecks.

Without a robust manufacturing sector, broad-based growth will be difficult to achieve. One of the key drivers for productivity growth in manufacturing is innovation. Economist Mariana Mazzucato of University College London [details](#) that the most innovative firms have benefited the most from public investment. But research shows that the [misallocation of talent](#) in science and engineering—through harassment and discrimination, disparate access to development and training opportunities, and occupational segregation—are costly for the innovation workforce, and therefore for the manufacturing sector.

Addressing gender and racial disparities in access to advanced manufacturing jobs is essential to boost dynamism in the sector. For instance, economists Lisa Cook at Michigan State University and her co-author Yanyan Yang [estimate](#) that U.S. GDP per capita could rise by between 0.6 percent to 4.4 percent if more women and Black Americans were included in the initial stages of the innovation process.

These barriers are present across industries and education levels. Women make up about a quarter of the manufacturing workforce but are [heavily underrepresented](#) in some of the occupations that have historically provided a pathway to the middle class for workers without a college degree, such as machine tool operators and welders. Women also face sexual harassment at [higher rates](#) in male-dominated industries such as manufacturing, which obstructs on-the-job well-being.

While employment in the U.S. manufacturing sector is now near its pre-pandemic level, the erosion of the manufacturing earnings premium and bad-quality working conditions could lead to slow job growth in the sector in 2022 and beyond. While goods-producing sectors such as manufacturing did not see the massive employment losses that services-providing industries

experienced in the first months of the pandemic, employment in the sector never fully recovered from the previous two recessions.

Indeed, manufacturing-sector employment reached its peak in the late 1970s and has been declining somewhat consistently ever since. Currently, [employment in the sector](#) is 35 percent below its 1979 level. Federal research and development [spending](#) is at a 60-year low, which means less knowledge creation, fewer good jobs, and a harder time boosting employment in new sectors. Investments in manufacturing—ranging from high-road purchasing, R&D spending, equitable trade policies, and tax subsidies—can therefore decrease inequities in the economy and help bolster growth.

Green energy

Building on the foundations of the economic recovery and the manufacturing sector, government investments in green energy, technology, and training can help address longstanding inequities by providing this pathway to workers of color today. With the current strong recovery, there is ample opportunity to make key investments in green energy that help to ensure growth is broadly shared and power imbalances in the U.S. labor market are addressed. Federal investments in energy research and development are low compared to [prior years' levels](#), and there is clearly room to invest.

Recent economic research demonstrates the importance of investments in green energy. For instance, Columbia University economist Joseph Stiglitz [argues](#), alongside other colleagues, that renewable energy and energy efficiency investments typically have high multipliers, delivering even greater returns over time. They also create more jobs, including ones that can't be taken offshore, such as those in home energy retrofitting.

Moreover, according to [recent research](#) from Heidi Garrett-Peltier, an economist at the University of Massachusetts Amherst, for every \$1 million invested in renewable energy or energy efficiency, almost three times as many jobs are created than if the same money were invested in fossil fuels. Investing more money in the fossil fuel industry will not address high and growing unemployment rates. Indeed, the Federal Reserve is not even requiring companies to keep workers as a condition for getting loans (in the fossil fuel industry-?).

Investments in training also can be a path to ensuring the benefits of green energy are broadly shared. For instance, Historically Black Colleges and Universities, or HBCUs, are at [the forefront](#) of training for green energy jobs. Indeed, [24 percent](#) of all Science, Technology, Engineering, and Mathematics, or STEM-related bachelor's degrees earned by Black students in the United States were conveyed by HBCUs.

This type of training will be necessary to ensure that a transition to green jobs is equitable, but it is not sufficient. As the Washington Center for Equitable Growth's Director of Labor Market Policy and Chief Economist Kate Bahn [explains](#), inadequate wages are not the result of a skills gap, but rather derive from a lack of worker power to collectively bargain for fairer wages. Increasing wage floors and worker power will be key to ensure there is not simply access to green jobs, but also that these green jobs are equitable.

[Writing for Equitable Growth](#), Leah Stokes and Matto Mildenberger, both assistant professors of political science at the University of California, Santa Barbara, outline ways to ensure that the high multipliers and job creation from green energy investments are equitably shared. One such mechanism is Community Benefits Agreements, which are contracts between large energy developers and communities hosting an energy project. These agreements require that the community receive a share of the project's benefits.

In the few offshore wind developments in the United States, for example, these agreements are already in place. Policymakers could provide extra incentives for projects that receive government subsidies or tax benefits to negotiate Community Benefits Agreements. These agreements also could require minimum wage standards, unionization, or other equitable labor market arrangements.

Regarding union requirements specifically, Stokes and Mildenberger highlight that many U.S. unions maintain strong ties to carbon-intensive industries, such as auto manufacturing or heavy industry. By contrast, many jobs in the clean energy sector—from clean energy deployment to electric vehicle manufacturing—remain nonunionized. In part, this reflects secular decline in union participation across new U.S. economic sectors. In order to address labor market disparities—[such as gender and race wage gaps](#)—government funding for clean energy projects should prioritize unionized jobs

In this vein, there is already precedent at the state level for ensuring green energy jobs are more equitable in labor market power. [Washington state, for example](#), tied labor standards to tax incentives for renewable energy development through the Clean Energy Transformation Act in 2019. The bill contains, among other provisions, business tax incentives on high-road labor standards and practices, such as apprenticeship utilization, a prevailing wage, local hires, and the use of Project Labor Agreements and Community Workforce Agreements, helping to promote good jobs.

Conclusion

There is clear precedent and ample opportunity for government investments to promote growth and address the harmful consequences of economic stratification in our nation. To make the U.S. economy more resilient and equitable, we need to build off the strong foundations of the current

recovery. I thank you for the chance to submit this testimony on how you can do just that in the manufacturing and green energy sectors.

Written Testimony of
Dr. Sudip Parikh, CEO
American Association for the Advancement of Science
 Before the Joint Economic Committee
 U.S. Congress April 27, 2022

Chairman Beyer, Ranking Member Lee, and Members of the Committee, thank you for the opportunity to testify today. I am Sudip Parikh, chief executive officer of the American Association for the Advancement of Science, the world's largest multidisciplinary scientific society, and the executive publisher of the *Science* family of journals. Our mission is to advance science, engineering, and innovation throughout the world for the benefit of all people or — put more simply — to advance science and serve society. I also serve as co-chair of the Science & Technology Action Committee, a group of leaders from industry, academia, non-profits, and foundations who came together to develop an urgent Action Plan to ensure a healthier, safer, and more economically sound future for all Americans.ⁱ

To begin, I'd like to ask a simple question: Do we want to be the nation that discovers, manufactures, and drives the economic, environmental, and health advances of the future? Or do we want to be the nation that lags in these future indicators while we attempt to buy them from friendly competitors or worse, geopolitical adversaries?

In the mid-1800s, Europe was the center of gravity for scientific discovery. In an apocryphal story, Michael Faraday, one of England's greatest scientists, was explaining a recent scientific discovery related to electricity to several members of Parliament. Future Prime Minister William Gladstone asked "but, after all, what use is it?" "Why, Sir," replied Faraday, "there is every probability that you will soon be able to tax it."

Faraday was absolutely right. The discovery of electricity marked an inflection point in history, opening entirely new fields of technology and improving the well-being of humanity, leading to everything from the light bulb to the internet.

Today, we stand at the cusp of similar inflection points in many scientific and engineering fields. Just three weeks ago, scientists from Fermilab reported that the W boson, a fundamental particle, weighs more than predicted by the standard model of physics.ⁱⁱ If this finding is repeated and verified, it means that there is a completely new frontier of physics for us to discover beyond what is currently known. It could be a discovery that parallels Benjamin Franklin's first understanding that sparks seen on earth were caused by the same phenomenon as lightning in the sky — and someday lead to entirely new parts of the economy that, as Faraday noted, might be taxed.

Even if this discovery turns out to be ephemeral, we are at similar inflection points in the fields of artificial intelligence, quantum computing, synthetic biology, gene editing, and more. We are at the cusp of revolutions in multiple sciences at once — with potential implications for our economy that could be as game-changing as electricity.

For the last 75 years — since Vannevar Bush's landmark *Endless Frontier* report, which set forth

a framework for federal investment in research and development — we have followed a recipe that has grown our economy in ways never imagined at the beginning of the 1900s: investments in research at the Department of Defense, National Institutes of Health, National Science Foundation, and over 20 other federal agencies have led to transformative innovation, which in turn directly created jobs and boosted the economy in game-changing ways. This recipe has been so successful that other nations have copied it — increasingly with even more vigor than us. The time has come for us to redouble our efforts, build on our enviable strengths, and show the world again what American investment, intellect, ingenuity and risk-taking can accomplish for the benefit of all.

Today, I'd like to make three recommendations to ensure that we continue to lead the world in scientific discovery and its translation into meaningful increases in the safety, health, and wealth of all Americans:

- Provide robust investment in research and development (R&D) across a broad range of disciplines and geographies.
- Invest in our people to ensure that we are drawing upon the talents of all Americans in our scientific research and that all Americans benefit from our investments.
- Balance a portfolio of R&D investment that includes short-term incremental research, translational research, and high-risk, high-reward research that, if successful, could change lives and revolutionize the economy.

Provide robust investment in research and development across a broad range of disciplines and geographies.

We need to ensure robust support for R&D across basic scientific disciplines to enable a wide field of scientific advance. This is for several reasons. First, it's impossible to predict which scientific disciplines will produce the next game-changing innovation. Indeed, knowledge relevant for economic growth or societal challenges has emerged from every scientific and engineering discipline. Second, modern science is increasingly characterized by multidisciplinary teams of researchers. Teams that work across disciplines are often shown to publish more frequently, with greater scientific influence, and can be effective at producing more novel innovations.ⁱⁱⁱ This is also critical for what's known as convergent research, in which existing disciplines combine to produce promising *new* fields, as is the case in synthetic biology. It seems the nexus between disciplines is fertile ground for creative thinking. Lastly, national challenges are often addressed obliquely, from scientific directions one wouldn't necessarily expect to be related. For example, longtime investments in computer science and high-performance computing at the Department of Energy are contributing to the science of genomics, which in turn could improve health outcomes for our nation's veterans.^{iv}

Why is this important to our economy?

Our own Golden Goose Award, which honors federally funded research that has an unexpected and significant impact on society, showcases several ways in which innovation has enabled the economy to grow. An array of technologies that have provided positive economic and societal impacts — such as the laser, internet browsers, the eradication of livestock-destroying pests, and a concept called “fuzzy logic” that spurred thousands of patents and improvements to widely

used technologies — can be directly traced to federal investments in research and development. The appendix of this testimony lists the economy-boosting outcomes of these and other stories.^v

The federal government should also be creating opportunities and incentives to build geographic diversity in science, technology, engineering, mathematics, and medicine (STEMM). For instance, the regional innovation hubs proposed by the Senate and House bipartisan innovation bills, USICA and America COMPETES, are compelling ideas that Congress must support. There are several examples of how federal investment in STEMM can bolster state and local economies. Many of the National Labs provide information about economic impact to their states. The Los Alamos National Laboratory, to cite one example, released a report last year showing 117 projects performed in conjunction with 174 New Mexico small businesses with more than 500 jobs created or retained.^{vi} And a 2020 economic report on NASA found impacts in all 50 states, particularly those with NASA facilities.[“]

The contributions of federal R&D to broader geographic prosperity coincide with another vital national challenge: the need to shore up domestic supply chains. Last year, as part of their 100-day supply chain review, federal agencies identified R&D investment as one of several key actions to strengthen domestic production. Policymakers seem to have recognized the importance of semiconductor manufacturing, with the proposed \$50 billion currently under discussion in the House and Senate bipartisan innovation bills. But the relevance of federal R&D extends to several other critical sectors as well, including advanced batteries, critical minerals, pharmaceuticals and biomanufacturing, biopreparedness, and the food supply, let alone the industries that make up the defense industrial base.

Invest in our people to ensure that we are drawing upon the talents of all Americans in our scientific research and that all Americans benefit from our investments.

To cure Alzheimer’s and cancers, go to Mars, understand the fundamental laws of the universe and human behavior, develop artificial intelligence, and build a better future, we need the brain power of the descendants of Native Americans, Pilgrims, Founding Mothers and Fathers, Enslaved People, Ellis Island arrivals, and the most talented immigrants from everywhere. The United States has thrived as a crossroads where people are joined together by ideas and contribute by choice to the freedom and opportunity provided by this wonderful, inspiring, and flawed country that is always striving to live up to our aspirations.

The core of our nation’s innovation ecosystem requires more than just funding. It relies on an investment in people — not just the scientists, engineers and mathematicians in our colleges, universities, industries, national labs, and biomedical facilities, but also the STEMM teachers, technicians, managers, financiers, patent attorneys, and more, whose collective efforts, grounded in science, fuel the nation’s innovation economy. STEMM knowledge and skills are necessary for people throughout the workforce and across the spectrum of our society, from farmers utilizing weather data and robotics to cultivate and manage crops, to those who care for us when we are sick using previously unimaginable diagnostic tools. Investing in people means strengthening the very fabric of our society.

This is not a new concept. CEOs of major companies have understood this secret for the past decade, as outlined in a 2011 report by Forbes Insights.^{viii} In an editorial published in one of our *Science* journals, serial inventor Joe DeSimone and Crista Farrell explored this concept further:^{ix}

“Diversity that arises from ethnic, cultural, socioeconomic, professional, and experiential differences forms fertile ground for innovation. A successful scientific endeavor is one that attracts and cultivates diversity, draws upon its breadth and depth, and thrives on the creativity it sparks. ...Thus, although convergence has been billed mainly as an integration of diverse disciplinary expertise from the life, physical, and engineering sciences, there is also the human factor to consider: how to leverage diversity among participants themselves.”

Scientific excellence and achievement are inextricably linked to diversity of thought and experience. Talking about diversity can be a double-edged sword. When complementary talents and perspectives come together, leaps in understanding are more likely and disruptive technologies are born. But there is also a vulnerability. When seized upon to divide (with talk of quotas in a zero-sum game), diversity can be used to generate fear and stoke division in ways that increase inequities and stifle substantive debate. In the scientific enterprise, explicit acts of racism and sexism still exist and cause harm. However, it is often the less obvious factors — divisive rhetoric, obsolete policies (such as overreliance on standardized tests), and willful blindness to inequitable treatment (such as smaller startup budgets for female academics) — that cement many of the injustices that have sprung from the nation's segregated history. These opaque forces are so ingrained that we scarcely realize their implications for minorities and women in science.

Insisting on inclusion of underrepresented groups neither sacrifices scientific excellence nor diminishes the accomplishments of those who have historically dominated the sciences. Put another way, highlighting the previously hidden does not invalidate the already admired. But this change requires that the scientific community increase attention and support for those who have been disadvantaged. At the same time, we must recognize we are operating with powerful social constructs with societal consequences that cannot be overlooked. When we provide inputs to algorithms, when we write software, when we design studies and recruit participants, we are making human choices. It matters who is at the table when those choices are made. We need as wide an aperture as possible to ensure that science has maximum benefit for society. Avoiding these conversations amounts to advocating for the status quo — and the United States would be weaker for it.

The idea of a wider aperture is reflected in the fact that last year the National Science Board and National Center for Science and Engineering Statistics (NCSES), which produce the *Science & Engineering Indicators*, broadened their definition of workers in science, technology, engineering and math to include those with at least a bachelor's degree as well as workers without a bachelor's degree, which incorporates skilled technical workers.^x There are different ways of looking at this. According to a survey by Science is US, which is housed at AAAS, two thirds of U.S. jobs are supported by science, tech, engineering and math, and the majority of that

workforce does not hold a four-year degree.^{xi} The need for a broad, inclusive STEM workforce is clear.

As a nation, we need to cultivate meaningful partnerships between elite research institutions and those with limited resources, between industry and academia, and between government and the institutions that conduct research and train the next generation of STEM professional across a wide spectrum of sectors.

The reasons for ensuring the diversity of science transcend the obvious moral imperative. Diversity of thought derived from diversity of experience gives America a critical advantage in the global competitive landscape. It is key to making the discoveries that will improve everyone's health, inventing the technologies that will grow the economy, and meeting the formidable challenges of this era. Without the innovative boost from a diverse population, the United States will be hard-pressed to compete on sheer numbers of scientists and engineers.

Balance a portfolio of R&D investment that includes short-term incremental research, translational research, and high-risk, high-reward research that if successful can change everything.

There is some evidence that the way we fund science is increasingly risk averse.^{xii} There are likely a variety of reasons the funding system may tend toward safer bets and incremental advances. In the worst-case scenario, these tendencies crowd out projects with game-changing upsides if they succeed, because the odds for failure are also high: such is the nature of high-risk, high-reward research. To broaden our search for breakthroughs and give scientists the flexibility and freedom they need, the federal government should actively pursue a broad portfolio of research projects with varied risk profiles. Several good models for funding high-risk but potentially revolutionary research already exist and have been implemented in the U.S. or elsewhere around the world, alongside more traditional funding models.^{xiii} We should learn from these efforts wherever insights can be had, and scale what works.

Investments in critical areas, such as semiconductor chip manufacturing via the CHIPS Act, are emblematic of the short-term investments that will yield important economic benefit and good jobs — while ensuring our security and the security of our supply chains. Basic research funded by the NSF, NIH, DOE, USDA, and elsewhere provides the longer-term seed corn for future breakthroughs. Translational research funded by the NIH, DOE, DOD, and others moves discoveries from the laboratory toward products and benefits for society. High-risk, high-reward research like that funded by DARPA and ARPA-Energy have the potential to be game-changers. The newly created ARPA-Health and ARPA-Infrastructure have the potential to break new ground in health and physical infrastructure.

Crucially, many of these ideas about risk, translation, and breakthroughs are wrapped up in the new NSF technology directorate, authorization of which is currently under consideration as part of the bipartisan innovation legislation. While there are differing visions for this new office, what they have in common are emphases on new and varied ways to fund science, a focus on the translation of basic science from lab to market, and an investment in novel approaches to expand

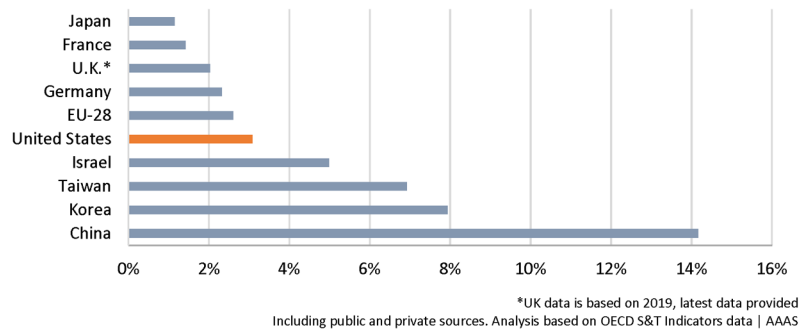
the regional map of innovation. The potential of this new directorate should be another strong motivator to complete negotiations on this legislation.

Our global competitors have also recognized the possibilities of robust investment in ideas and talent.

While we make these types of investments, the world is not standing still. Many nations have seen the benefits of all these models and are copying them with success. Earlier, I referenced a study from scientists at Fermilab that might change our fundamental understanding of physics and open up entirely new fields of discovery. The instrument where that data was collected was decommissioned several years ago. The verification of the result will have to come from the cutting-edge instruments of today, which are based in Europe and Asia and not in Illinois.

In the last 20 years, U.S. R&D expenditure from all sources has only grown at a rate of 3.1% annually, in constant prices. This investment has been eclipsed by the meteoric 14.3% annual rise of China's R&D expenditure over the same period, as well as more robust investments by Korea, Taiwan, and others. This means that while the U.S. remains the largest funder of public and private R&D, others have closed the gap. The U.S. accounted for 39% of global R&D in 2000, but today the share has fallen to 30%.

Figure 1: Annual Real Growth in R&D Expenditures 2000-2020



There's also been robust growth in venture capital, a key ingredient for financing and commercializing innovative technologies. The U.S. has well-entrenched long-term dominance in VC investment, and American venture capital continues to set new records. But over the past decade, Chinese VC investment has increased by an order of magnitude, and VC investments in both China and Europe have surpassed \$30 billion in three of the past six quarters. This is not to say that U.S. leadership in this metric is threatened, but it does indicate the continued expansion of innovation economies overseas.

Beyond investment, the innovation economy also needs talent. The U.S. has one of the largest research workforces in the world, but it has already been surpassed by China in total researcher headcount. Several other economies have seen more rapid workforce growth as well: for instance, Germany and Korea have seen their respective number of researchers increase by 28% and 24% over the past five years, versus U.S. growth of 18%. Around the world, this workforce expansion is happening in both business and academia, underscoring the importance of a diversified workforce – not only in individuals but also in sectors.

Aggressive financial and human capital investment is helping others translate science into inventions, products, and processes. These can be measured using a metric known as “triadic patents,” or patents for the same invention filed in the United States, Japan, and Europe. In 2018, the latest year for which data is available, U.S. applicants filed for 18% fewer triadic patents than in 2000, as compared to Korea’s 138% increase over the same time period, and China’s whopping 6018% increase.

This does not mean that the United States is not a powerful engine for innovation. American inventors still dominate the biotech, medical, and nanotech patenting space, and are only beaten by Japan in information and communication technology and environmental technology patents. Still, our competitiveness needs to be actively maintained.

No nation on earth is more responsible than the United States for getting us to the cusp of inflection points in so many scientific disciplines — inflections points that could create step changes in economic growth and human well-being. The decisions we make today on where and how to invest will determine whether we will make the discoveries and translate the science into health and prosperity — or someone else will.

While other nations may invest and challenge U.S. competitiveness, I still find myself optimistic and hopeful. The United States is in an enviable position. We have capital, and we have research infrastructure. Now we need to light the fire by making some strategic bets as a nation, investing in those areas we know are going to be a part of the future, and investing in people to help us get there. Thank you for the opportunity to testify today. I stand ready to work with you and look forward to your questions.

APPENDIX**Golden Goose Awardees — Examples of Enhancement of the Economy**

- Funding from the National Science Foundation and Office of Naval Research enabled the invention of the laser, which was born out of the seemingly obscure technique of amplifying waves of radiation into an intense, continuous stream. Now, laser technology enables many industries essential to the U.S. economy, from production of transportation equipment to the biomedical sector. The market for laser processing, which is used in manufacturing, was worth \$11.8 billion globally and \$2.8 billion in the U.S. in 2020.
 - https://www.reportlinker.com/p05798980/Global-Laser-Processing-Industry.html?utm_source=GNW
- National Science Foundation funding for supercomputing projects modeling collisions of black holes led to the creation of the first internet browsers. In 2020, the internet contributed \$2.45 trillion to the U.S.'s \$21.18 trillion GDP.
 - <https://www.iab.com/news/study-finds-internet-economy-grew-seven-times-faster/>
- Research funded by the Agricultural Research Service on a novel pest control technique — which involved understanding the sex life of the screwworm fly — led to the eradication of the deadly fly in North and Central America and saved the U.S. billions of dollars. In 1996, avoiding losses associated with the fly yielded economic benefits of \$796 million to livestock producers and \$2.8 billion to the U.S. as a whole (not adjusted for inflation).
 - https://www.aphis.usda.gov/animal_health/emergency_management/downloads/rrg_econimpact-nws.pdf
- Researchers funded by the National Institutes of Health massaged infant rats to develop a technique that has saved the lives of hundreds of thousands of premature babies and resulted in about \$4.7 billion dollars in hospital cost savings each year due to shorter stays in the NICU.
 - <https://srcd.onlinelibrary.wiley.com/doi/abs/10.1002/j.2379-3988.2004.tb00024.x>
- Research funded by the National Institutes of Health and Air Force Office of Scientific Research that focused on how cats' eyes respond to dots moving on a screen resulted in a treatment for congenital visual impairments like cataracts. The research also paved the way for the machine vision industry, which allows computers to process images like humans; the industry is growing very quickly and was valued at \$13.23 billion in 2021.
 - <https://www.grandviewresearch.com/industry-analysis/machine-vision-market>
- Researchers granted funding from the National Science Foundation and Office of Naval Research studied the foraging behavior of bees and their communication via a “waggle dance” to create an algorithm that has streamlined internet services for consumers and maximized revenues for web hosting services, a market estimated in 2021 to be worth \$30 billion in the U.S. alone.
 - <https://www.marketresearch.com/Global-Industry-Analysts-v1039/Web-Hosting-Services-30864413/>

- The mathematical concept of “fuzzy logic,” developed by a researcher with funding from the National Science Foundation and Air Force Office of Scientific Research, has spurred over 16,000 patents and improvements in fields ranging from HVAC systems to voice recognition software, a field that generated \$2.9 billion in North America in 2018.
 - <https://www.fortunebusinessinsights.com/industry-reports/speech-and-voice-recognition-market-101382>
- Researchers studying game theory with funding from the Atomic Energy Commission, National Science Foundation, and Office of Naval Research solved the FCC’s immense challenge of allocating the nation’s telecommunication spectrum via sophisticated, enormously complex auctions. The FCC has conducted 87 spectrum auctions and raised over \$60 billion for the federal government, while facilitating the ability to make cell phone calls from anywhere in the country, watch cable TV, find a restaurant anywhere in the world, and livestream the “big game” from a smartphone.
 - <https://www.goldengooseaward.org/01awardees/auction-design>

Sudip S. Parikh, Ph.D.

**Chief Executive Officer and Executive Publisher, Science Journals
American Association for the Advancement of Science (AAAS)**

Sudip Parikh, Ph.D., became the 19th chief executive officer of the American Association for the Advancement of Science (AAAS) and executive publisher of the Science family of journals in January 2020. Parikh has spent two decades at the nexus of science, policy, and business.

Immediately prior to joining AAAS, Parikh was senior vice president and managing director at DIA Global, a neutral, multidisciplinary organization bringing together regulators, industry, academia, patients, and other stakeholders interested in healthcare product development. He led strategy in the Americas and oversaw DIA programs that catalyzed progress globally toward novel regulatory frameworks for advanced therapies not amenable to existing regulations.

Prior to DIA, Sudip was general manager of the Health and Consumer Solutions business unit and vice president at Battelle, a multibillion-dollar research and development organization. He led a \$150 million business unit with over 500 scientific, technical, and computing expert performing basic and applied research, developing medicines and healthcare devices, and creating advanced analytics and artificial intelligence applications to improve human health. Previously, Parikh led Battelle’s global AgriFood business unit. Headquartered in London and Geneva, this unit provided environmental fate research and agriculture product development services from laboratories throughout Europe and the United States.

From 2001 to 2009, Parikh served as science advisor and professional staff to the United States Senate Appropriations Committee, where he was responsible for negotiating budgets for the National Institutes of Health (NIH), Centers for Disease Control and Prevention, Agency for Healthcare Research and Quality, Biomedical Advanced Research and Development Authority, and other scientific and health agencies. A key legislative liaison to the research and development ecosystem, Parikh was on the frontlines of many science policy issues debated during that time, including embryonic stem cell research, cloning, disease surveillance, bioterrorism, cyber security, and doubling the NIH budget.

An active member of the scientific advocacy community, Parikh serves as a board member and officer for several impactful organizations, including Research!America, Friends of Cancer Research, and ACT for NIH. He has received multiple public service awards, including recognition from the American Association of Immunologists, the National AIDS Alliance, the Coalition for Health Services Research, and the Juvenile Diabetes Research Foundation.

Sudip is committed to early STEM education and, as a parent of three energetic young children, he prioritizes volunteering as a mentor for Science Olympiad teams at two elementary schools. Early in his career, Parikh was a Presidential Management Intern at the NIH. He was awarded a National Science Foundation Graduate Research Fellowship while earning his Ph.D. in macromolecular structure and chemistry from the Scripps Research Institute in La Jolla, Calif. There, he used structural biology and biochemistry techniques to probe the mechanisms of DNA repair enzymes bound to DNA. The son of Indian immigrants who worked in the textile and furniture manufacturing plants of North Carolina, Parikh completed undergraduate studies at the University of North Carolina at Chapel Hill, first as a journalism major before switching into materials science.

ⁱ <https://sciencetechaction.org/>

ⁱⁱ <https://www.science.org/content/article/mass-rare-particle-may-conflict-standard-model-signaling-new-physics>

ⁱⁱⁱ <https://psycnet.apa.org/doiLanding?doi=10.1037%2Famp0000319>

^{iv} <https://blogs.va.gov/VAntage/37500/va-partners-with-department-of-energy-on-big-data-initiative-to-improve-health-care-for-veterans/>

^v <https://www.goldengooseaward.org/>

^{vi} <https://cdn.lanl.gov/files/Los%20Alamos%20National%20Laboratory%20-%202021%20Economic%20Impact%20on%20New%20Mexico.pdf>

^{vii} <https://appel.nasa.gov/2020/10/15/report-quantifies-nasas-far-reaching-economic-impact/>

^{viii} https://images.forbes.com/forbesinsights/StudyPDFs/Innovation_Through_Diversity.pdf

^{ix} <https://www.science.org/doi/full/10.1126/scitranslmed.3004486>

^x <https://beta.nsf.gov/science-matters/measuring-progress-and-gaps-us-skilled-technical-workforce>

^{xi} <https://scienceisus.org/stem-supports-two-thirds-of-us-jobs/>

^{xii} <https://www.nber.org/papers/w28905>

^{xiii} <https://www.oecd.org/sti/effective-policies-to-foster-high-risk-high-reward-research-06913b3b-en.htm>

Testimony of Dr. Tyler Goodspeed before the U.S. Congress Joint Economic Committee

To: Members of the Joint Economic Committee
From: Dr. Tyler Goodspeed
Date: April 27th, 2022
Subject: Committee Hearing entitled, "Building on a Strong Foundation: Investments Today for a More Competitive Tomorrow"

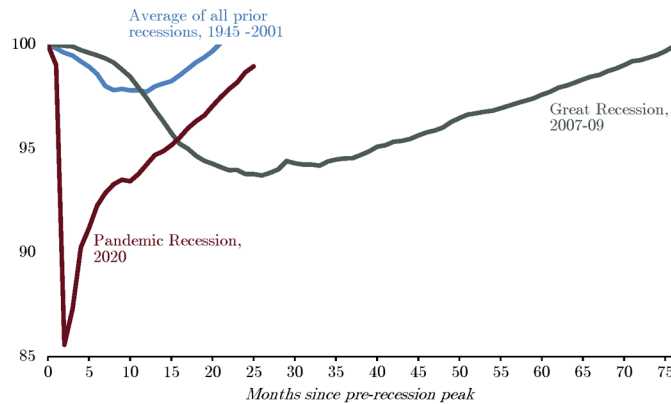
Chairman Beyer, Ranking Member Lee, and Members of the Committee:

Thank you for the opportunity to testify before you today on an important macroeconomic issue, namely, investment to enhance the future potential of the U.S. economy.

I am a Kleinheinz Fellow at the Hoover Institution at Stanford University and the U.S. Director at Greenmantle LLC, a global macroeconomic advisory firm. From 2017 to 2021, I had the privilege to serve on the President's Council of Economic Advisers as Senior Economist, Chief Economist for Macroeconomic Policy, Member, Vice Chairman, and Acting Chairman. In the latter roles I advised on the economic policy response of the Federal government to the worst macroeconomic shock to hit the U.S. economy since the Great Depression, a response which contributed to the 2020 recession being officially the shortest recession in U.S. history. In my academic work I have published extensively on economic and financial history, monetary economics, and the role of access to credit in mitigating adverse macroeconomic shocks.

Figure 1. Employment Recoveries in Postwar Recessions, 1945-2022

Employment level (index, pre-recession = 100)

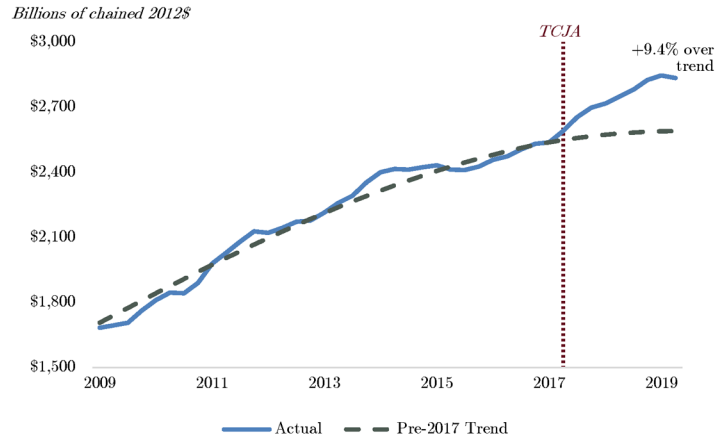


Source: Bureau of Economic Analysis and Bureau of Labor Statistics via Haver Analytics; author's calculations.

The subject of today's hearing may be informed by evaluating lessons from the aftermaths of the two most recent U.S. recessions—the 2007-09 recession associated with the global financial crisis, and the pandemic recession of 2020. As reported in Figure 1, the former was characterized by the slowest labor market recovery in postwar U.S. history, and constituted a notable exception to Friedman's (1964, 1993) "plucking" model of business fluctuations, in which the amplitude of an economic expansion is strongly correlated with the amplitude of the preceding contraction.¹ Recent research by Bordo and Haubrich (2017) confirms that this correlation is even stronger when a contraction is coincident with a financial crisis, with the aftermath of 2007-09 being one of only three exceptions over the past 140 years.²

In particular, the slow recovery from July 2009 through December 2016 was characterized by two historical anomalies. First, the contribution of capital deepening to labor productivity growth turned negative, meaning essentially that despite an historically slow labor market recovery, firms' gross investment in new plant and equipment per worker was insufficient to keep pace with depreciation of existing capital per worker. Second, the prime-age labor force—those between the ages of 25 and 54 either employed or actively looking for work—declined by 1.6 million, despite continued population growth within that age cohort.

Figure 2. Real Private Nonresidential Fixed Investment, 2009:Q3-2019:Q4



Note: The pre-2017 trend is calculated by regressing the growth rate in real private nonresidential fixed investment on a linear time trend over the 2009:Q3-2016:Q4 sample period. The trend is then projected forward and backward from the level of real private nonresidential fixed investment in 2017:Q3, with trend levels reconstructed from projected growth rates.

Source: Bureau of Economic Analysis via Haver Analytics; author's calculations.

In response to this anomalously slow recovery, in 2017-19 the U.S. government implemented an agenda of tax and regulatory reform designed to lower the cost of domestic capital formation, to reduce tax

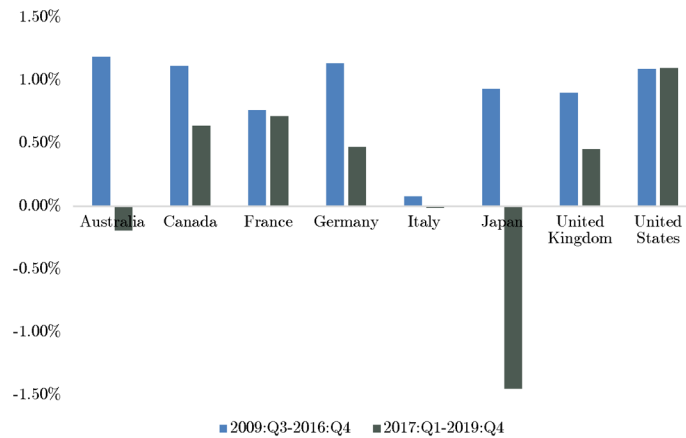
¹ Milton Friedman, "Monetary Studies of the National Bureau," in *The National Bureau Enters Its 45th Year* (New York, NY: National Bureau of Economic Research 44th Annual Report, 1964), 7-25; Milton Friedman, "The 'Plucking Model' of Business Fluctuations Revisited," *Economic Inquiry* 31 (1993): 171-177.

² Michael Bordo and Joseph Haubrich, "Deep Recessions, Fast Recoveries, and Financial Crises: Evidence from the American Record," *Economic Inquiry* 55 (2017): 527-541.

expenditures and reinvest those revenue savings into marginal personal income tax rate reductions, and increased the standard deduction to help raise after-tax rates of return on work as American workers entered or reentered employment at the lower end of the income distribution. In addition, the U.S. government embarked on a deregulatory program to facilitate new business formation and incentivize increased domestic investment and hiring.

Reflecting this pro-growth agenda, in 2018 and 2019 real private nonresidential fixed investment rose to a level that was 9.4% above the trend of the pre-2017 expansion, as demonstrated in Figure 2. An increase in business investment of this magnitude could be expected to raise the long-run potential output of the U.S. economy by approximately 3%. As business investment rose above trend in 2018 and 2019, so too did labor productivity growth. As reported in Figure 3, in 2018 and 2019, the United States was the only major advanced economy (G7 economies and Australia) to observe labor productivity growth rise above its pre-2017 expansion average.

Figure 3. Growth in Labor Productivity among Advanced Economies, 2009–19

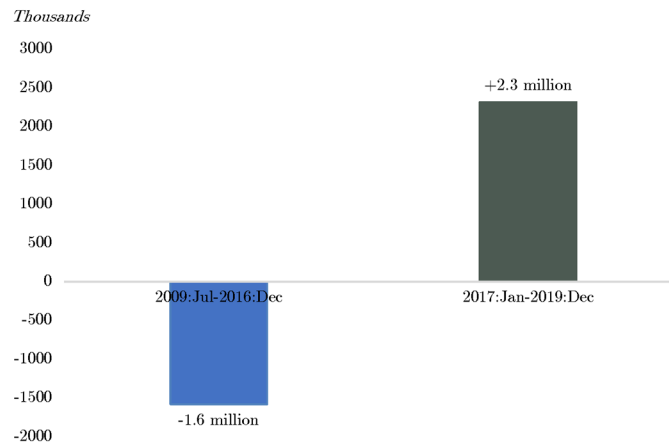


Note: Reported growth rates are compound annual growth rates in real GDP per employed person, computed over the specified quarters.
Source: Organisation for Economic Co-operation and Development; author's calculations.

As shown in Figure 4, whereas during the economic expansion from July 2009 through December 2016 the number of prime-age Americans between the ages of 25 and 54 either employed or actively looking for work declined by 1.6 million, in the three years through December 2019 the prime-age labor force increased by 2.3 million. By the end of 2019, approximately three quarters of the flows into employment were individuals entering work from out of the labor force. Despite this substantial increase in labor supply, business demand for labor was such that real, inflation-adjusted wages for the bottom 10th of the wage distribution rose 9.6%, compared to 4.6% for the top 10th of the distribution, while real median household income in the three years from 2017 through 2019 rose by more (\$5,900) than in the 20 years from 1996 through 2016. Rising real wages are a strong incentive for workers to enter or reenter the labor force, which was reflected in rising labor force participation rates. As a result, wage, income, and wealth inequality declined, and labor's share of income rose.

With the arrival of the COVID-19 pandemic in early 2020, the Organisation for Economic Co-operation and Development projected that the U.S. economy would contract by more than 12% during the four quarters of 2020. The non-partisan Congressional Budget Office forecasted that the official unemployment rate would surge to 16% and end 2020 still above 10%, with some private forecasters projecting a peak unemployment rate of 25%. Instead, the National Bureau of Economic Research concluded that the 2020 pandemic recession ended in April 2020, with the recovery officially commencing in May 2020. Unemployment peaked at 14.7% in April 2020, and by the end of the year had already declined to 6.7%—lower than in November 2013. The broadest measure of labor market underutilization, U-6, had declined to 11.7%—lower than in August 2014. Following job recoveries of 2.6 million, 4.5 million, 1.4 million, and 1.7 million in May, June, July, and August 2020, by December 2020 the U.S. had already recovered 55% of the job losses of March and April 2020, and the U.S. economy had recovered 78% of the decline in the level of output in the first and second quarters of 2020.

Figure 4. Change in Prime-Age Labor Force, 2009-2019



Source: Bureau of Labor Statistics via Haver Analytics; author's calculations.

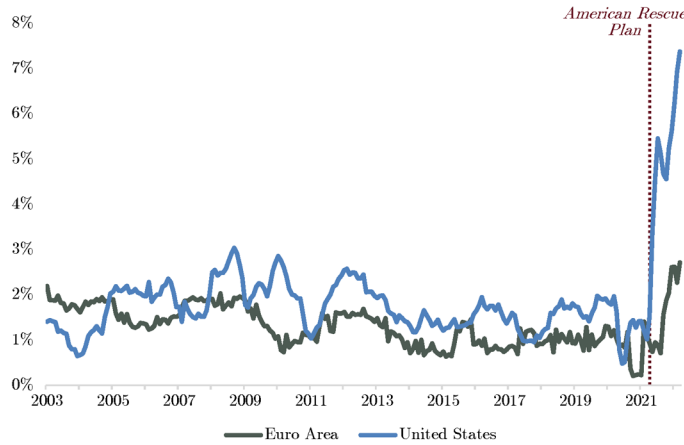
Eleven months into this recovery, in March 2021 Congress passed and President Biden signed into law the American Rescue Plan Act of 2021, which introduced stimulus spending equal to approximately 9% of the U.S. economy, a fiscal stimulus of unprecedented magnitude for an economic expansion. Applying standard fiscal multipliers to a fiscal expansion of this size would imply aggregate demand rising to a level as much as 5% above pre-pandemic forecasts of potential output. In the month of March 2021 alone, consumer demand for goods surged by 10.7%. With a large gap between aggregate demand and real aggregate supply, the difference was reflected in a substantially higher price level via inflation.

The fiscal expansion in early 2021 not only strained a supply side of the U.S. economy that was still recovering from pandemic-related disruptions by excessively stimulating aggregate demand, but further impaired that supply-side recovery by raising implicit marginal tax rates on the return to work. Specifically, the extension of a \$300-per week Federal supplement to unemployment insurance benefits until September 2021 and the expansion of the Child Tax Credit (CTC) through the end of 2021 effectively raised implicit marginal tax rates on workers. Not only did the larger credit raise implicit

marginal tax rates over the income phase-out thresholds, but also a lower phase-out threshold for the increased credit meant that more workers were affected by those higher implicit tax rates. Moreover, the expanded CTC under the American Rescue Plan also increased implicit marginal tax rates on the return to work over the phase-in threshold by substantially lowering the return to work relative to the expansion of the CTC under the 2017 Tax Cuts and Jobs Act, as demonstrated by Corinth et al. (2021).³ The prime-age labor force participation rate rose just 0.6 percentage point from March to December 2021. At the end of 2021, prime-age labor force participation was still 1.1 percentage points below its pre-pandemic level, implying 1.4 million missing workers between the ages of 25 and 54.

In addition, the Build Back Better plan contributed to increased business tax uncertainty that likely impeded a recovery in business fixed investment, which has incurred a large cumulative shortfall since the start of the pandemic, relative to pre-pandemic trend. A shortfall in business investment results in a smaller private capital stock, translating into lower long-run potential output. In particular, the prospect of higher corporate income tax rates after 2021 would have generated a large incentive for firms to defer planned investment in new equipment, as the deduction for bonus depreciation is more valuable under a prospective 28% Federal corporate income tax rate than under a 21% rate.

Figure 5. Harmonized Index of Core Consumer Prices, 2002-2022



Note: Year-over-year percent change. HICP excluding food and energy for United States. HICP excluding food, energy, alcohol and tobacco for Euro area.
Source: Eurostat via Federal Reserve Bank of St. Louis; Bureau of Labor Statistics via Haver Analytics; author's calculations.

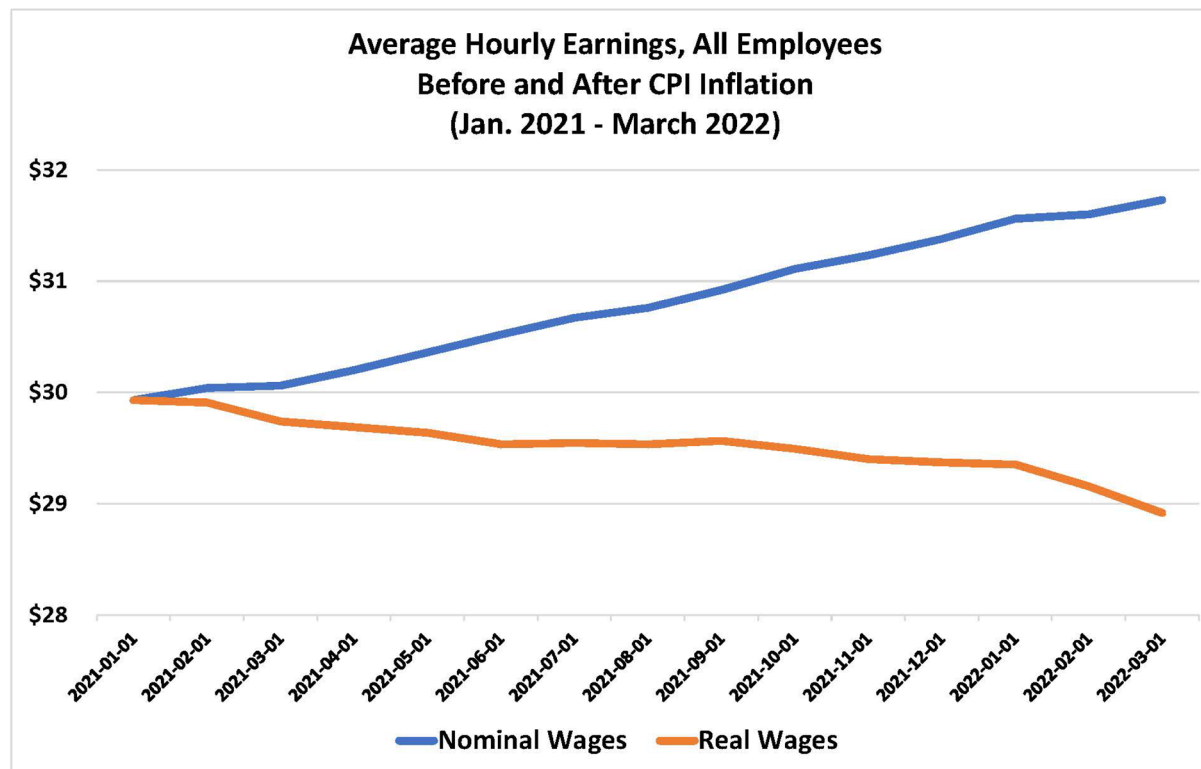
Reflecting this exacerbation of the mismatch between aggregate demand and supply that was introduced in March 2021, inflation in the United States, which had been rising at the same or slightly slower pace (1.0%) as in the Euro area (1.1%) in the 12 months through February 2021, surged after March 2021. By January 2022—before the Russian Federation's invasion of Ukraine—the increase in the core rate of inflation in the United States since February 2021 was more than quintuple that in the Euro area over the same time period, as measured by the Harmonized Index of Consumer Prices

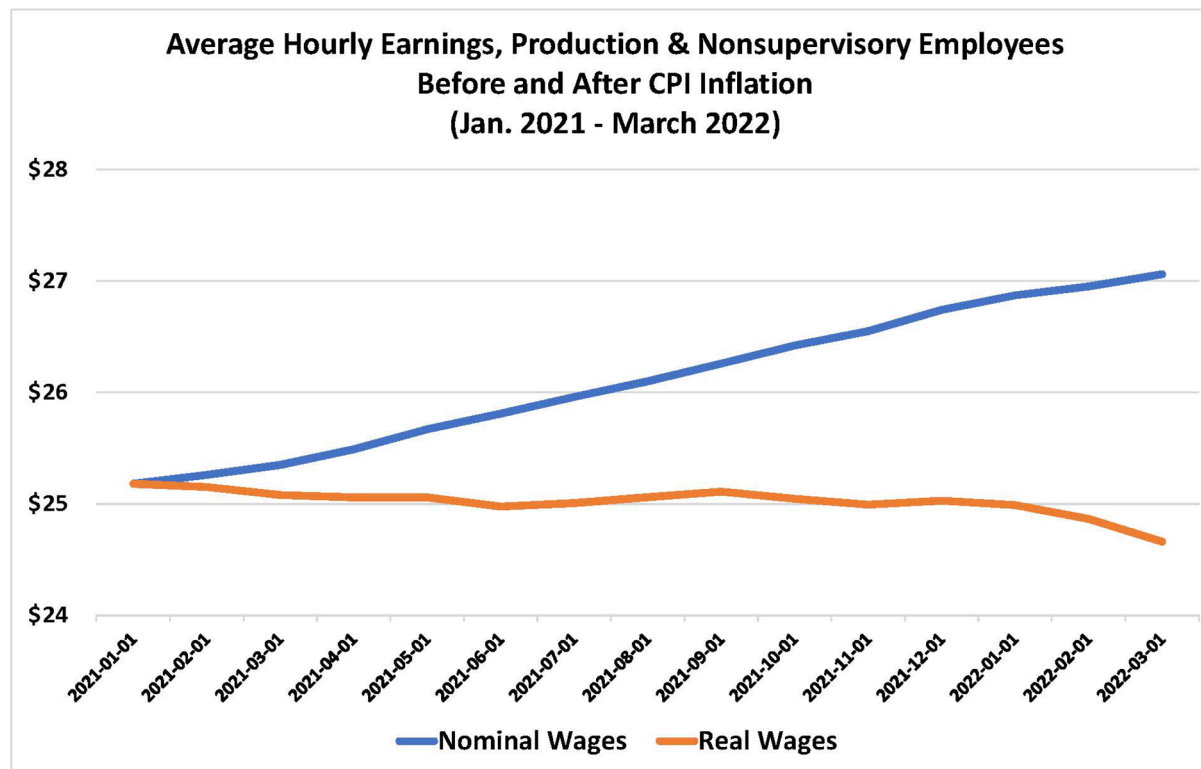
³ Kevin Corinth, Bruce Meyer, Matthew Stadnicki, and Derek Wu, "The Anti-Poverty, Targeting, and Labor Supply Effects of the Proposed Child Tax Credit Expansion," National Bureau of Economic Research Working Paper No. 29366 (October 2021).

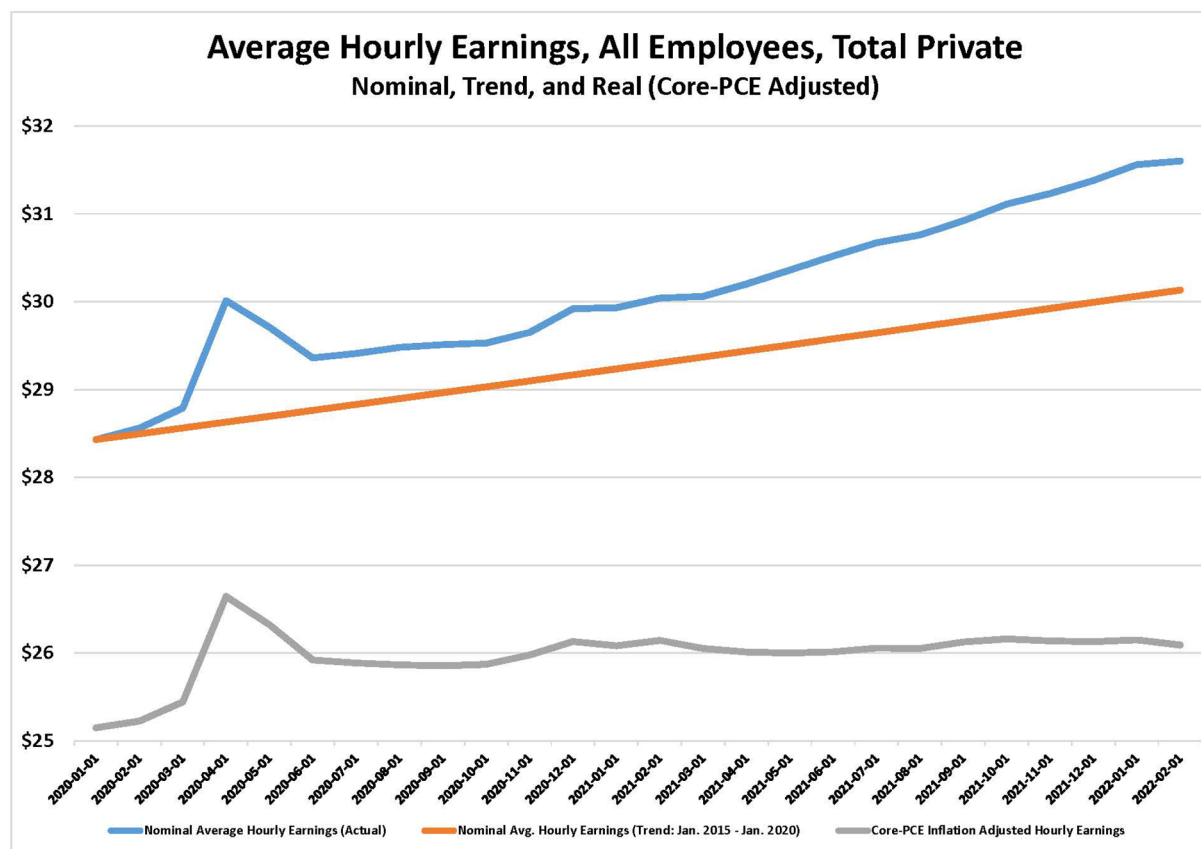
(HICP), which standardizes inflation comparisons between the United States and Euro area.⁴ Explanations of high U.S. inflation that are global in nature—for example, supply chain disruptions or semiconductor shortages—are therefore unable to explain all of the increase in inflation in the United States over the past year, because inflation has risen by much more in the United States than in other advanced economies. Sector-specific investments and subsidies are therefore unlikely to resolve inflationary pressure that is fundamentally macroeconomic in nature.

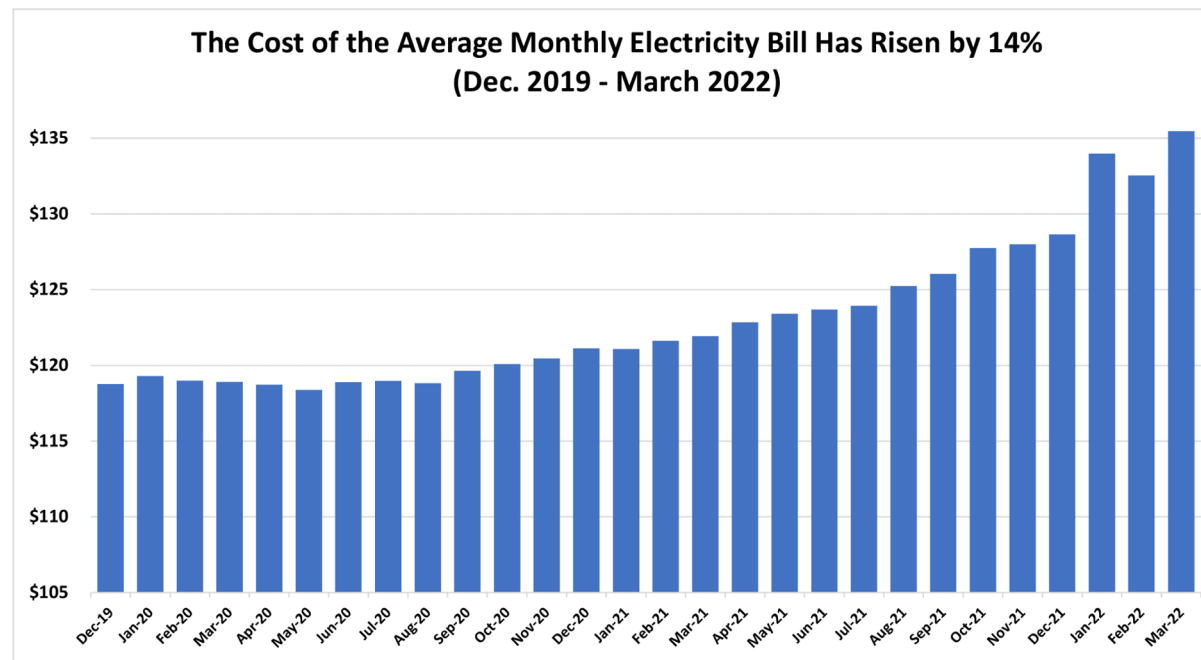
The pattern of recent economic recoveries in the United States therefore suggests that a tax and regulatory environment that encourages broad-based private investment and labor force participation and avoids overstimulating demand is essential for facilitating robust economic expansion in a manner consistent with price stability. In particular, the experience of 2017-19 demonstrates the efficacy of lowering the cost of capital to incentivize increased private domestic capital formation and investment in workers, and raising the after-tax rate of return on work, in generating strong and long-run sustainable economic growth that delivers real gains across the income distribution.

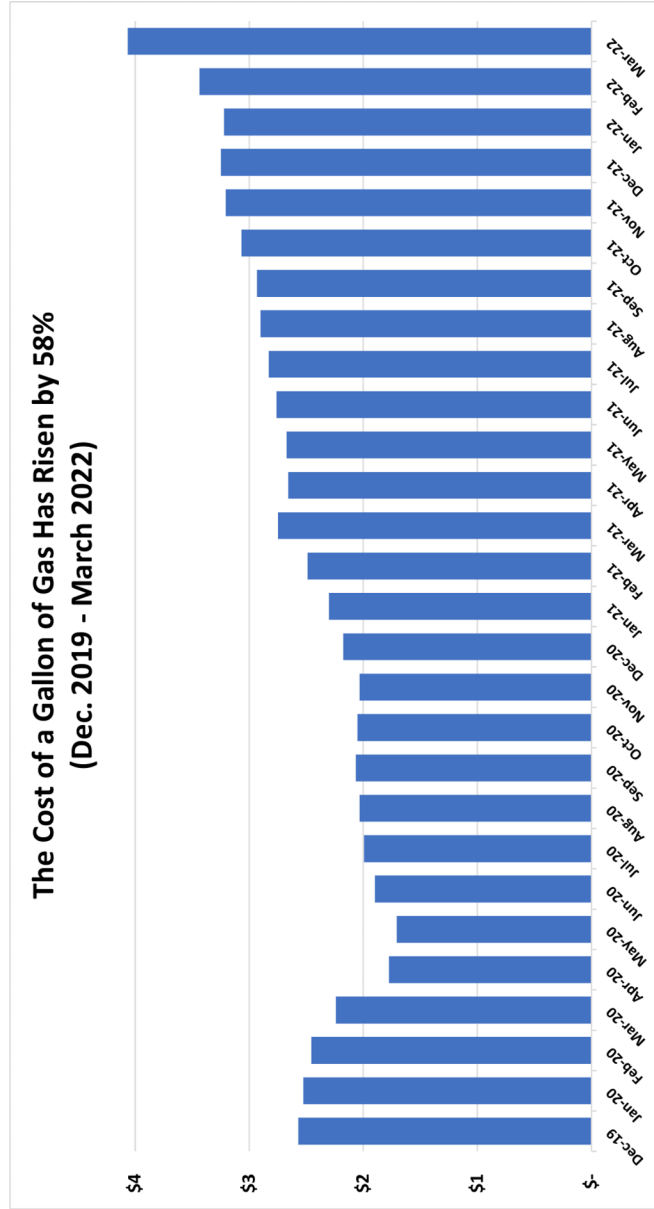
⁴ Core HICP (excluding volatile food and energy) for the United States is available through the Federal Reserve Bank of St. Louis. Core HICP for the Euro Area is also available through the Federal Reserve Bank of St. Louis, but excludes food, energy, alcohol, and tobacco.

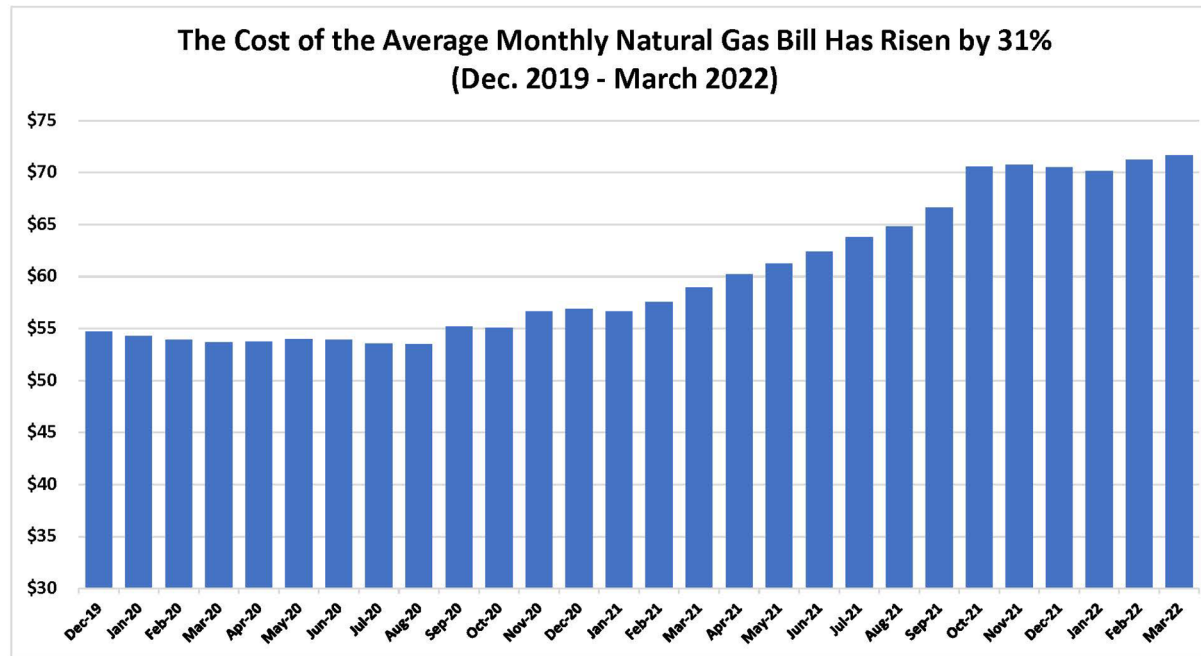


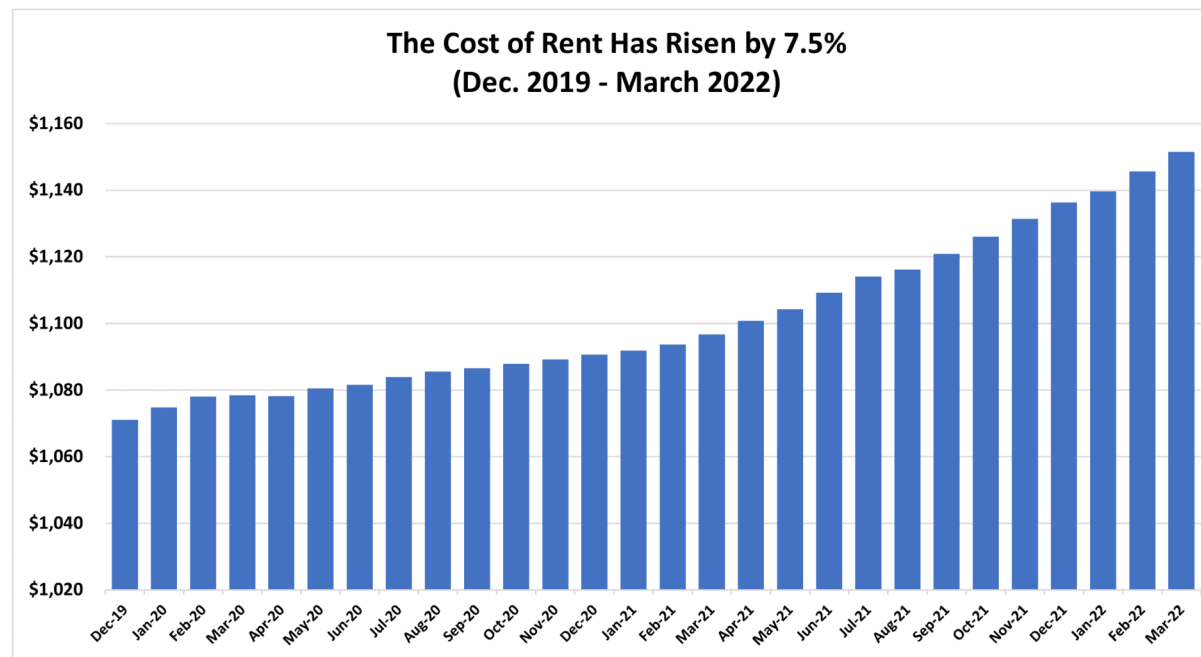


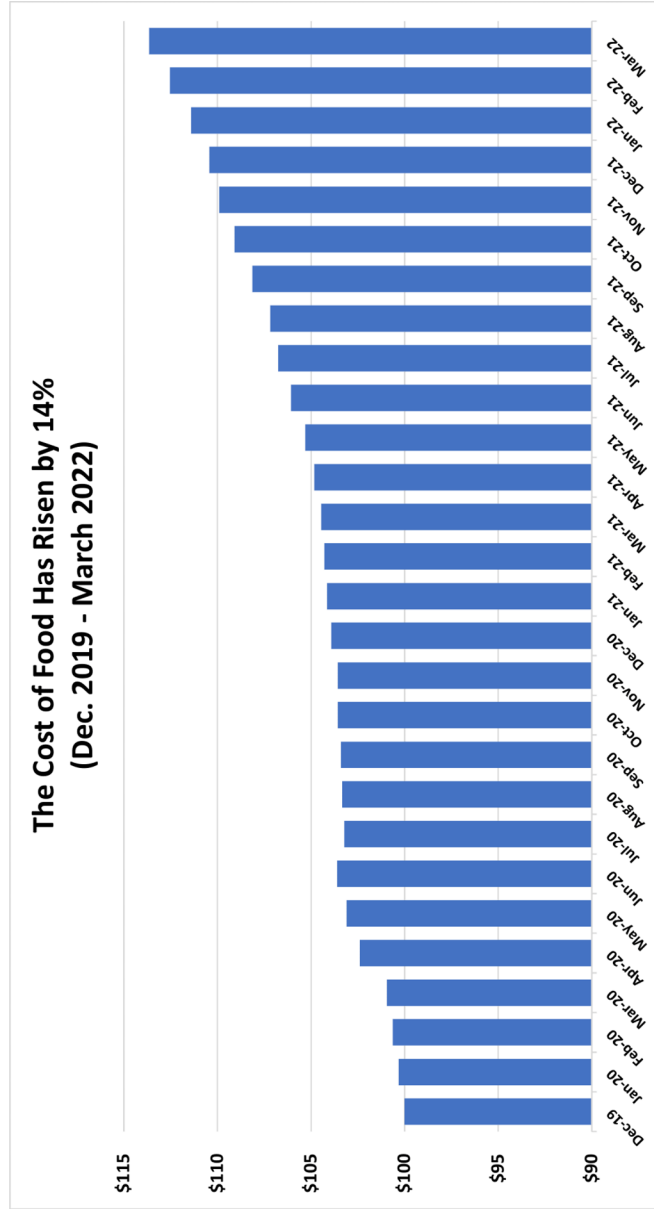


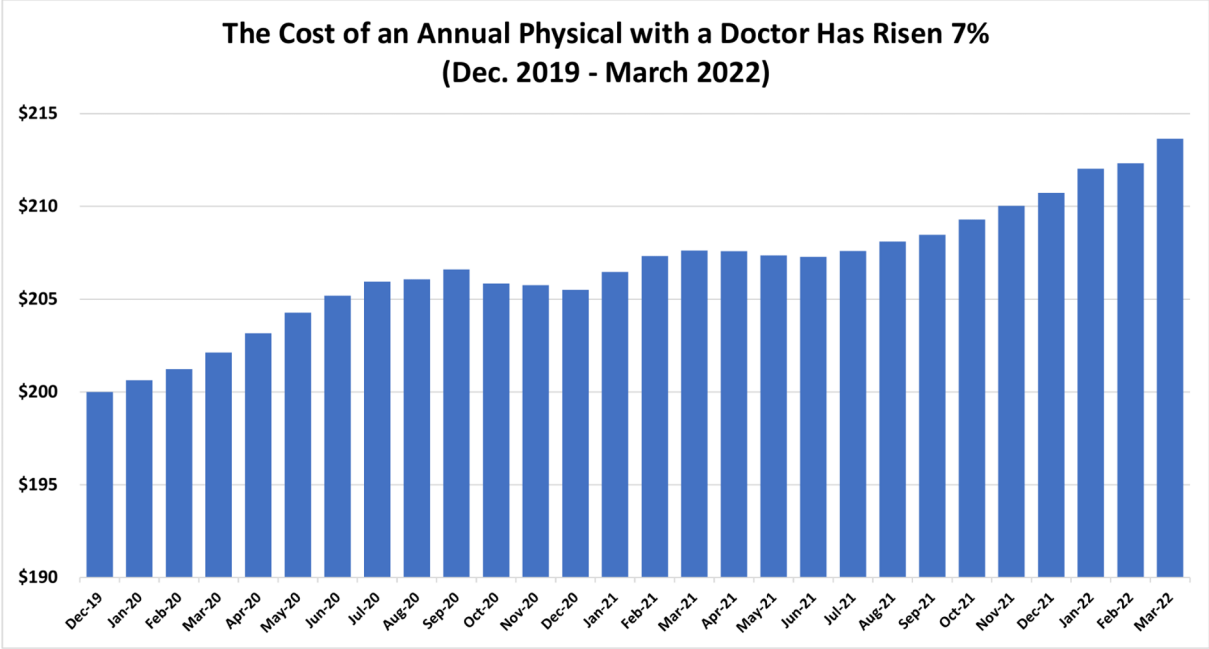












QUESTION FOR THE RECORD FOR DR. JOSH BEVINS
SUBMITTED BY SENATOR KLOBUCHAR

The U.S. is facing a manufacturing skills gap that's estimated to leave over 2 million jobs unfilled by 2030 and could cost the U.S. economy as much as \$1 trillion. My Apprenticeships to College Act with Senator Moran, which was included in the House-passed America COMPETES Act, would allow workers to earn college credit for completed apprenticeships, creating a pathway for workers to gain skills while earning a good wage.

- **What role does collaboration between the public and private sectors play in closing the skills gap and strengthening American manufacturing?**

QUESTION FOR THE RECORD FOR DR. JOSH BEVINS
SUBMITTED BY SENATOR WARNOCK

You noted in your testimony, "Before the pandemic struck, economic growth in the United States was too-slow and too-unequal for decades." How can Federal investments help contribute to a more equitable recovery? What impact would this have on the overall economy?

RESPONSE FROM DR. MICHELLE HOLDER TO QUESTION FOR THE RECORD
SUBMITTED BY SENATOR KLOBUCHAR

One of the most persistent workforce challenges, especially in rural communities, is access to affordable child care. Many manufacturers and businesses have job openings, but cannot find enough trained workers due to the lack of affordable childcare options. That's why I introduced the bipartisan Child Care Workforce and Facilities Act to educate and retain child care workers and build and expand facilities in child care deserts.

How are child care access and affordability a barrier for parents interested in returning to the workforce?

The current market for child care does not meet the needs of working families. This is not simply an issue for families with young children. Accessible, affordable, and high-quality care also has the potential to generate substantial economic activity and growth that benefits the entire U.S. economy.

In 2019, even before the pandemic's devastating effects on the child care industry, roughly half of U.S. families lived in child care deserts, defined as U.S. Census Bureau tracts where there are three young children for every licensed slot for child care. The COVID-19 pandemic only worsened these supply challenges. Further, at an average annual cost of more than \$9,000, the price tag of care puts child care out of reach for many U.S. families.

The inability to access affordable, high-quality child care is devastating for families. It also constricts the economy's ability to grow. Research shows that when the supply of child care in a community increases, so too does that community's parental labor supply. Likewise, when the cost of child care decreases, researchers find and again find an associated increase in parental labor supply.

Recent studies in the U.S. context find that a 10 percent reduction in the cost of child care increases maternal employment by between 0.5 percent and 2.5 percent. To put that in more concrete terms, in a State such as West Virginia, where about 136,000 women have children at home and participate in the civilian labor force, a 10 percent reduction in child care costs would lead to around 3,400 women entering the labor force. That's 3,400 more breadwinners for families with children, 3,400 more productive workers, and more dollars in the pockets of 3,400 consumers to support local businesses.

More research is needed to understand how the quality and continuity of available child care options affects parental labor force participation. But a 2008 study of mothers in low-wage jobs found that 19 percent stopped working entirely in the same quarter in which they experienced a disruption to their child care arrangements, compared to only 9 percent who did not experience such a disruption. The evidence strongly suggests that when child care is available, affordable, and high quality, more parents get jobs and keep them.

As a result, the economy grows. Employers have access to a larger workforce from which to select talent, and workers are less likely to leave well-matched jobs prematurely, which saves firms rehiring and retraining costs. And it's not just workers who are brought off the sidelines, but entrepreneurs as well. Parents with winning business ideas will be free to launch ventures and pursue the American Dream, household incomes rise and drive consumer spending, and the tax base from which we can fund pro-growth government programs grows.

As we have recently seen all too clearly, child care also has an important role to play in stabilizing the macro economy. The child care market is fragile. A combination of reliance on out-of-pocket payments that strain parents' budgets and slim profit margins means that even a small downturn in the economy can cause a damaging and persistent ripple through the child care sector as parents pull their children out of child care. This pushes providers into the red, which results in layoffs, reduced capacity, and permanent closures from which it can be difficult or impossible to rebound.

We've seen this play out during the COVID-19 pandemic, as well as prior economic recessions. When unemployment rates increase in the broader labor market, they increase more quickly in the child care sector: Every 1 percent decline in a state's overall employment is associated with a 1.04 percent decline in child care employment. But when the economy rebounds, the child care sector lags: Every 1 percent increase in a state's overall employment is only associated with a 0.75 percent increase in child care employment.

We are seeing this slower recovery play out in real time. As of April 2022, the child day care sector remains approximately 116,000 jobs (or approximately 10 percentage points) below February 2020 levels. Hiring in child care has plateaued in recent months, likely driven by low wages in the sector failing to keep up with inflation and wages offered in competing sectors. With low profits and insufficient government investment, providers are constrained in how much they can raise wages without passing on higher prices to families, who are already struggling to afford child care services.

Together, these factors suggest that hiring in the child care sector will continue to lag behind the broader economy. This lag can be a drag on reemployment, as we are seeing today: Parents who seek to return to work after a period of unemployment must be able to secure child care, which will be out of reach without greater public investment.

Indeed, while the United States once held a competitive edge in the global economy due to growth in women's labor force participation over the past century, that growth has since stagnated, and the labor force participation rate in the United States now falls below the average for OECD nations. During the first year of the COVID-19 pandemic, when families struggled without adequate access to paid leave and child care, women's labor force participation fell—hitting a low we haven't seen since 1988.

The child care industry remains in crisis with the supply of good-quality care too low, the cost of care too high, and child care workers earning too little, stopping parents from working and causing pressure on family budgets. We need a child care program in which no family is asked to pay more than is manageable to ensure that their child is safe and nurtured during the work day, that ensures that early care educators can focus on the children for whom they care without being distracted by their own financial hardship, and that the system has the resources it needs to ensure that children are receiving high-quality care.

When the supports we deliver to families to ensure that care is adequate meet these benchmarks, when we have built a policy environment that values care for all people who need it—whether it's people with disabilities who need professional support to fully engage in their communities; young children who should be able to grow up in households that are economically secure, so that their parents can meet the family's basic needs and focus on parenting; or older adults who have spent their lives providing care for others and now need support themselves—when this happens, we will know that we have sufficiently shifted our orientation to care to correct our market failure and allow the economy to grow.

RESPONSE FROM DR. MICHELLE HOLDER TO QUESTION FOR THE RECORD
SUBMITTED BY SENATOR WARNOCK

What would the economic ramifications been if Congress failed to pass programs such as the CARES Act and the American Rescue Plan to support hard-working families during the pandemic? Is there any data you can point to that supports your answer?

The unprecedented speed and size of the American Rescue Plan and the CARES Act helped millions of workers and households withstand the economic pain brought on by the COVID-19 pandemic in a remarkably rapid rebound. The bounce back in Gross Domestic Product, for example, was much quicker in the United States than in most other high-income countries. The safeguards and subsidies provided to families through this legislation provided an effective stop-gap to prevent income shocks that can have long-term impacts on workers and households, compared to previous recessions in which hard-hit groups faced long-term poor economic outcomes in earnings and employment even into the recovery.

The prime-age employment rate, one of the best measures we have of overall labor market health by looking at workers in their prime working years, is now close to its pre-pandemic level. And workers in the bottom of the wage distribution have been experiencing real wage growth. Labor demand has skyrocketed, giving workers more power to negotiate higher pay and better working conditions, including sparks in the labor movement.

As such, job openings in the United States reached a series high since data began being collected in 1999, of 11.1 million in July 2021—an almost 60 percent increase from February 2020—and have remained elevated since. The jump in open positions has been particularly stark in industries such as leisure and hospitality, which declined steeply early in the pandemic, and manufacturing.

Indeed, the recovery in overall employment has been extraordinarily quick, compared to previous U.S. economic downturns. According to Moody's Analytics, in a counterfactual scenario in which this fiscal response was not provided, real GDP would have fallen 11 percent in 2020—more than three times its actual decline. The economy would have also succumbed to a double-dip recession in early 2021. Without government support, jobs lost during the pandemic recession would not have been regained until 2026.

Furthermore, the Federal Government's investment in enhancing Unemployment Insurance and expanding the Child Tax Credit bolstered family economic security across the socioeconomic spectrum, reduced poverty for millions of children, allowed workers to search for jobs that matched their skills, and improved the ability of parents to invest in their children's critical human capital development. Following the unprecedented shock to the labor market caused by the COVID-19 pandemic in March 2020, Congress supported workers who lost their jobs through enhancements to the existing Unemployment Insurance program. The Census Bureau found that in 2020, Unemployment Insurance reduced the overall poverty rate by 1.4 percentage points, pulling 4.7 million people out of poverty. Research also shows that when workers access more unemployment benefits, they are able to seek out jobs that are good matches for their skills to the benefits of themselves, their employers, and the broader economy.

Then, in 2021, by providing families with monthly income support to supplement their own earnings and help offset rising prices, the temporarily enhanced Child Tax Credit lifted an estimated 3.7 million children out of poverty. It also helped reduce racial disparities in household income, as poverty rates fell drastically for Black and Latinx children. This temporary policy provides a clear blueprint for a successful permanent program.

While inequities in the U.S. labor market remain persistent, employment gains made by Black women and Latina workers suggest the recovery efforts are reaching those who are often the last to recover from a recession at a much quicker pace than previous recessions. The fiscal response to the COVID-19 pandemic is directly responsible for the swift recovery we're experiencing today. With economic growth still strong, there exists a real opportunity to continue to make government investments to ensure the recovery is not just strong, but also equitable and thus more enduring.

RESPONSE FROM DR. SUDIP PARIKH TO QUESTION FOR THE RECORD
SUBMITTED BY SENATOR WARNOCK

You noted in your testimony, “There is some evidence that the way we fund science is increasingly risk-averse.” Will you expand on how taking “safer bets” could lead us to fall behind on the global stage and its overall consequences to our economy?

The United States’ commitment to basic science R&D has led to greater original ideas and discoveries. Basic research lays the groundwork for future scientific and technological development, and it often addresses society’s largest challenges, such as mitigating climate change, curbing antibiotic resistance, or bolstering food and water security. It is not a stretch to say that almost every technological or medical miracle of today finds its roots in fundamental discovery-driven research, often built on decades of work that came before. It is the U.S. Federal research agencies—both defense and nondefense—that are the primary investor of basic research that has fueled this innovation ecosystem.

As I noted in my written statement, a significant barrier to adopting a more dynamic, less risk-averse funding system is funding itself. The pressure and competition within the Federal funding system reinforces the tendency to go for the sure thing. Safer bets and incremental advances may yield positive outcomes, but they risk crowding out projects that could bring game-changing rewards.

A strong and sustained upward funding trajectory can create the opportunity to take more risks or pursue greater experimentation—essentially, it can let us loosen the reins and really try new things. It would allow us to stretch our ideas and creativity to the horizon of discovery in addition to performing incremental research. For example, it would allow us to tackle a significant scientific question by funding more than one research project that approach a solution to that question in novel ways. That is the innovation strategy that other nations are pursuing and why we see the research intensity of countries like China scaling up dramatically. These countries are willing to take risks by investing heavily in research on critical, emerging technologies and implementing effective policies for high-risk, high-reward research. For example, in China it encourages research proposals that steer away from the mainstream. The OECD published a report on this subject last year.

The challenge we face today is political will—and the patience to know that spending on high-risk, high reward research does yield tremendous results, but often over longer periods of time. That is challenging for a legislative body that appropriates on an annual basis and operates in a 2-year legislative cycle—but not impossible.

