Sharpening the Edge:
The State Of the Digital Innovation Economy

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White Paper

September 2021

DATA CATALYST INSTITUTE

Summary

Since World War II, technology-driven firms have raised our living standards and cemented the primacy of U.S. economic power, and the importance of technological innovation shows no signs of receding. As the world emerges from the COVID-induced recession of 2020 through 2021, America will face new challenges, such as low secular levels of productivity growth, the rise of a China increasingly at odds with Western economies, and an increasing resolve to devote resources to address income inequality and climate change. In this environment, policymakers will have to make important decisions to ensure the United States maintains both the political and economic conditions that enable innovation in this country.

This report explains how American innovation has traditionally thrived because of sound policy decisions at the federal level. It then discusses several influences on the future growth of digital innovation in the United States. The report concludes by advocating several policy solutions that will help ensure that American leadership in digital innovation continues. Possible policy responses include expanding U.S. tech talent, expanding the Research and Experimentation (R&E) Tax Credit for small businesses, increasing federal spending on applied technology research, increasing access to capital for disadvantaged small business owners, ending accredited investor limits on “private placement” investments in private businesses, and reducing barriers to international data flow and digital commerce.

Technology, Innovation, and American Productivity

Digital innovation has significantly helped to power the American post-World War II era of robust income and productivity growth, driven by considerable government spending on science, technology, and innovation, the development of new firms poised to exploit these developments, and strong growth in the development of human capital.[1] Economists consider productivity growth, which is output per hour worked, as the key component for long-term economic growth in the economy. While the economy can grow by getting more people into the labor force and having them work more hours, the only way to achieve sustained long-run economic growth is for the workers to produce more goods and services for each hour that they work.

Federal Policymaking and U.S. Innovation: Economists such as Stephen Oliner and Daniel Sichel believe that a major reason for America's robust 1990s productivity growth was due to the increased adoption of information technology (IT) and efficiency gains associated with its production.[2] IT innovation and its application throughout the 1990s' economy demonstrates the importance of sound policy decision making in Washington, D.C., where both Congress and the executive branch took steps to encourage an environment of innovation. The Clinton administration's famous five principles for an open internet called for governments to avoid undue restrictions on electronic commerce. When government involvement is necessary, its aim should be to support a predictable, minimalist, consistent, and simple legal environment.[3] To that end, Congress passed several important pieces of legislation during this time, such as the Digital Millennium Copyright Act, which protects the intellectual property rights of internet content creators, and the Communications Decency Act (CDA) liability shield, which protects publishers from liability stemming from third party content.

Internet-based innovation took off in the 1990s, but the sector's evolution and growth has wildly accelerated since then. Companies that didn't exist two decades ago have become virtually indispensable to the U.S. economy and employ millions of middle-class American workers. Amazon alone employs more than one million people, many of whom are in roles not requiring a four-year college degree, something desirable in an economy in which two-thirds of adults lack one. This quarter-century of digital innovation has also dramatically improved the United States' economic productivity and overall standard of living (not to mention virtually the entire world's, too). While everyone now has more access to information and entertainment, this is particularly true for society's less fortunate, who now have incredible access to knowledge and communications tools. They frequently have some form of digital-based education, novel ways to access business capital, the ability to sell goods online inexpensively, and more. In turn, as

America exported these technologies and ideas to a global stage, their adoption by societies across the world has underpinned a proliferation of democratic ideals, capitalist economic principles, and social and economic progress.

Digital Innovation in a Reopening World: Fast-forwarding to the present moment, we cannot avoid discussing digital innovation outside the context of COVID-19 and the "Reopening World" that we all live, learn, socialize, and conduct commerce in. Digital innovations such as video conferencing and online payments have been a pandemic lifeline for large companies connecting with thousands of employees, clients, and customers, "Main Street" small businesses just trying to stay afloat, and average people doing everything from ordering groceries online and home-schooling children to connecting with loved ones and working remotely. In a world where consumer, educational, and workplace preferences have suddenly become mobile, virtual, remote, contactless, and convenient, digital innovation is suddenly no longer a luxury.

The real question is whether this pace of innovation and adaptation can and will be maintained post-pandemic. While the pandemic has no real precedent in modern American history, World War II may be the most recent analogous period. It led to an amazing array of innovation that began to transform the economy and also altered societal norms, so the population became more amenable to changes and began to look at them as an opportunity, rather than a threat.[4] A similar change in societal norms resulting from the pandemic and the rapid pace of societal changes it has engendered may beget an economy where people continue to embrace new technologies, pursue new occupations in new industries, and seek new opportunities. Moving forward, it is hard to imagine a world in which consumers and businesses use digital technologies less than they are right now.

The U.S. Digital Economy At a Critical Stage

Importance of U.S. "Innovation Hubs": Silicon Valley – both an actual location in California and a prestigious global brand of research and development (R&D) – was originally spurred by the confluence of top universities, the defense industry, and visionary entrepreneurs. Today, this positive feedback loop continues to attract promising students, talented programmers, ambitious leaders, and venture capitalists aiming to identify and invest in new ideas to Silicon Valley and other technology hubs around the country. The U.S. benefited tremendously from having Silicon Valley as the original hub of the global IT revolution, and now continues to benefit from both powerhouse locations such as Silicon Valley, San Francisco, Los Angeles, Seattle, Chicago, Austin, New York City, and Boston, and lesser appreciated tech hubs such as Portland,

Boulder, Las Vegas, Minneapolis, Dallas, St. Louis, and Nashville in every part of the country.

More recently, companies that rely on the innovative digital infrastructure created by the initial wave of tech giants are also thriving. For example, Zoom began less than a decade ago as a video communications platform and became a publicly traded company in 2019. In the last year, its stock price more than quintupled as people adopted it en masse to hold meetings or classes. Similarly, electronic payment company Square went public in 2015 and gradually increased market share until the pandemic, when demand for its services exploded along with its stock price. Many startups aspire to achieve such heights. There are slightly less than two million apps in the Apple app store and nearly three million in the Google Play store. While most of them represent only modest success, or even total failure, there appears to be no superior way to innovate than investing substantially in a myriad of ideas and striving for an occasional success. Few economists believe that a top-down government-directed approach, such as what China envisages, can supplant the "Silicon Valley model."

These days, the entrepreneurial ecosystem is thriving with more startups achieving unprecedented success through an influx of private capital or merger and acquisition (M&A) activity. As just one measure of this, in the first half of 2020, approximately one startup company of $1 billion valuation was minted every three working days and their collective value exceeds $2 trillion. Dating app Bumble (founded in 2014) recently went public with a valuation of about $9 billion. However, the playbook of quickly leveraging a startup's high valuation status with a traditional public stock offering has been set aside somewhat, ironically allowing such firms to grow even bigger and faster while avoiding some scrutiny. Such firms can raise very significant money privately without a public offering via venture capital funds, private equity firms, large investment funds, and even major corporations eager to make private investments, not to mention being able to themselves generate significant revenue. This is, in part, because M&A has been a viable exit for investors – indeed, 58% of U.S. startups expect to be acquired and over the last decade and a half, M&A deals have increased over 300%. This has allowed investment into innovative ideas to scale and find synergies integrated with other products and services without necessarily having to find an independent path to monetization. Ultimately, more options for raising funds and managing a growing business has resulted in more opportunities for digital innovation and economic growth.

A "Digital Safety Net" for the Main Street Economy: The U.S. digital innovation economy, which employs or supports roughly nine million jobs across the U.S. (almost six percent of total U.S. employment)[5], is being affected by policymakers and regulators in Washington and many U.S. states. The nation's small businesses have arguably never needed a high-performing digital infrastructure more than they do now, but innovators in Silicon Valley will need to navigate a complex governmental and societal landscape in the coming years, and it is far from assured

that Washington will make continued development of innovation in the United States a priority.

While the wealth of company founders, early employees, and investors makes news headlines, the true beneficiaries of Silicon Valley innovations are the millions of “Main Street" small businesses that now rely on the technology created there to connect with customers and employees, refine operations, and – during the pandemic – find creative ways to stay in business during uncharted times. The average business in the U.S. is less than 20 employees, relatively new, and located far from the San Francisco Bay Area. Nevertheless, these small businesses benefit greatly from the companies and innovations developed in America’s major tech hubs, especially during the challenging pandemic-era economic environment. In turn, these small, non-technology businesses provide desirable services to consumers in the United States and across the world, which in turn improves everyone’s lives.[6]

By and large, it is easy to start a new business in the United States. There are few governmental hurdles, the taxes on new businesses tend to be lower, the regulatory barriers to running a business in the United States are less than in Europe, and the country’s powerful digital infrastructure can help an entrepreneur get a website, begin advertising, set up a payroll system, and connect with clients quickly. At the same time, policymakers should understand that while the pandemic has accelerated the need for new businesses to access both working capital and digital innovations, there are both financial and knowledge gaps that contribute to an uneven playing field for small business owners. While the issue is complex and somewhat outside the scope of this paper, years of business experience, bank relationships, credit history, available savings, specific industry, and socioeconomic, race, and gender issues can all be contributing factors.

The 2017 Tax Cut and Jobs Act attempted to ameliorate these gaps in access to capital in several ways, most notably by the creation of Opportunity Zones in low-income and minority neighborhoods that allow investors to delay or even escape paying capital gains taxes. The Biden administration has made improving access to capital for minorities a priority, including the announcement of a plan to create a $150 billion public-private fund that would focus on investment in minority communities.

The Role of Washington at a Critical Juncture: The past year and a half has been marked by a health emergency, a small business economic recession, and a transfer of presidential and congressional power between political parties. At this critical juncture in American history, how can Washington best help both Silicon Valley (one of our key engines for innovation) and Main Street (which will now rely more than ever on digital tools in a post-COVID world)? Given the importance of digital innovation in powering national security, economic growth, and consumer product development, it is not a stretch to say that ensuring that innovation thrives is central to ensuring the country’s future success and way of life.

A steady pace of U.S. digital innovation should not be taken for granted by leaders in Washington: the two-decade pause in productivity growth beginning in the early 1970s is a good reminder that it has waned in the recent past and could again in the future. Rejecting complacency is especially important because evidence suggests that the digital economy is currently at a nexus. Productivity growth slowed since the early 2000s yet adaptations to COVID have reignited the widespread optimism of the 1990s, acting as a catalyst for further digital innovation and adoption.

Promoting U.S. Innovation: Recommendations For Policymakers

The Washington Policy Backdrop: With this backdrop, Washington can continue to promote American technological leadership, economic growth, and the welfare of consumers through policies that have garnered broad bipartisan support for decades.

Perhaps most importantly, Washington should affirm its commitment to maintaining the bipartisan consensus of the past forty years on antitrust law.That consensus, embraced by presidential administrations of both parties, centers on the consumer welfare standard. Under this standard, courts and law enforcement agencies evaluate business practices based on how those practices affect consumers, rather than on how those practices affect specific competitors. Courts ask, for example, whether a particular merger would lead to lower prices, higher quality goods and services, and more innovation – or the reverse. For forty years, this standard has provided objective metrics for assessing business activity, free from politics, to the benefit of consumers.

Moreover, this standard has created a predictable legal regime that rewards new ideas and allows easy access to capital. America's dynamic economy, including its technology sector, leads the world in part because of this stable and objective framework.Many of the world's largest and most successful technology companies, as well as smaller and newer companies, have been built from the ground up in the United States, rather than abroad, largely because our legal and regulatory environment is stable, predictable, and uniquely hospitable to vigorous, paradigm-shattering competition by all businesses. That legal environment is a hallmark of American exceptionalism.

Unfortunately, some advocates have started to question that bipartisan consensus. In particular, some proposals would abandon the consumer welfare in favor of a standard that protects specific competitors, rather than the principle of competition, on the theory that more competitors are always better, regardless of the potential impact on price, quality, or investment

in future innovation. Other proposals would "structurally separate" companies into individual lines of business and require the government to grant prior permission to private companies to merge or acquire other firms, reversing the current rule where mergers are presumed lawful and economically beneficial.

These ideas would harm consumers. M&A, for example, provides acquired companies with critical financing, sometimes ensuring their survival, and allow acquiring companies to bring new products to consumers faster and cheaper. Studies confirm that mergers and acquisitions usually lead to lower prices and greater innovation for consumers.

Moreover, these ideas would discourage the types of investment and innovation that supports America's economic edge. Overly aggressive antitrust scrutiny could harm the many startup founders who invent new products and services with the explicit goal of the company being acquired by a larger technology firm. Indeed, the Department of Justice (DOJ) itself has recognized that overly aggressive antitrust enforcement can harm America's national security. In a recent brief filed in support of a domestic chip manufacturer, DOJ explained that "a significant reduction in [the company's] technological competitiveness … could seriously harm U.S. national security." Such enforcement efforts "would impair unduly" the company's ability to invest in research and development and to supply the military and other national security actors.

Geopolitical considerations also pose a threat to future innovation, as a shifted antitrust environment would indirectly strengthen large Chinese technology companies, such as Alibaba, Baidu, and Tencent. China's efforts to boost research and development at home may pose a threat to global innovation and economic growth because China fails to respect the rules and conventions governing intellectual property. It flouts World Trade Organization (WTO) rules designed to protect intellectual property, and actively assists its companies in obtaining such assets (sometimes illegally). The Chinese government also uses its intelligence agencies to provide China's state-owned enterprises with intellectual property purloined from laboratories, research centers, and major technology companies across the globe. The government also requires companies that wish to operate in China to form a joint venture with a domestic company and provide that partner with access to its intellectual property pertaining to operations in the country. China's perfidy in obtaining data and intellectual property to help its own companies advance technologically and compete against other global companies serves to reduce the gains from investing in innovation, which reduces the amount that's ultimately done elsewhere.

Instead of adopting radical proposals, many of which were tried and rejected decades ago, Washington should ensure that antitrust law remains impartial, untainted by politics, and guided by the best interests of consumers. To that end, policymakers could enact a range of antitrust proposals that would help consumers and build upon the bipartisan consensus of the past four

decades. For example, concerned policymakers should ensure that the antitrust agencies have the resources they need to enforce existing laws, while safeguarding the role of the courts in deciding the ultimate fate of a proposed merger. At the same time, the antitrust agencies should enhance public transparency and accountability by explaining in writing the bases for their enforcement and non-enforcement decisions, and more regularly conducting and publicizing retrospective analyses on significant transactions. Similarly, certain process adjustments, such as standardized processes, would improve the efficiency with which the antitrust agencies use their existing resources. Through these and other ideas, all of which build upon the nation's long bipartisan consensus, Washington can continue to protect the welfare of consumers while maintaining the nation's economic edge.

Encouraging "Homegrown" U.S. R&D: There are several actions that policymakers can take in the near term to broadly encourage more R&D within the United States. Some of these include expanding U.S. tech talent, expanding the Research and Experimentation (R&E) Tax Credit for small businesses, and increasing federal spending on applied technology research.

Expanding U.S. Tech Talent

One way to staunch the decline in production of STEM majors at U.S. universities is to encourage young people from disadvantaged communities to pursue such careers more often. While top high schools in wealthier school districts typically prepare their graduates to embark upon a college math and science curriculum, that is often not the case at schools in less wealthy communities where many students do not end up attending a four-year college. One potential solution is to make financial aid conditional on major, so that STEM students receive more aid (all else being equal).

Even earlier in the process, this challenge could be addressed by providing special STEM training for public high school teachers. While high school-level STEM teachers in non-U.S. countries almost always hold a STEM degree of some type, in the U.S. such teachers typically have degrees in education, with little formal STEM training. Additional ways to encourage the same outcome would be to pay high school teachers in STEM fields more than in other disciplines, to provide tuition reimbursements for advanced training and education, and to improve the recruitment process of these educators. There is also a cohort of adult learners with the aptitude and interest in pursuing a STEM field, but they lack an expedient path for doing so in most communities. The U.S. Department of Education has a nascent "OER STEM Project" (Open Educational Resources to Increase Teaching and Learning of STEM Subjects in Adult Education Project) that strives to assist colleges offering STEM programs for adult learners, but it offers little more than instructional tools.

Finally, policymakers should make it easier for foreign-born students to study at U.S. schools and to remain in the U.S. to work after completing their degree in a STEM field. The numbers of such students have been declining for several years due to several factors. This would, in effect, boost "homegrown" U.S. R&D by allowing more foreign nationals to stay longer and conduct STEM-related work here at U.S. institutions and companies instead of in their home countries or elsewhere.

Expanding the Research and Experimentation (R&E) Tax Credit

The purpose of the R&E tax credit is to incentivize corporate R&D spending. The credit covers spending on supplies and wages, but not depreciable durable assets, such as buildings and equipment. The statutory test for determining if an expense is research-related asks if the spending at issue occurs while conducting research that is "technological in nature" and is used to develop a new product, process, or software. The process for calculating the credit can be complicated, but it essentially amounts to a 14 to 20 percent rebate on qualified spending above a certain base amount, so that it provides a tax break on incremental spending over a baseline. The 14 percent credit is known as the "alternative simplified credit" and is geared towards new and small businesses.[7] This promotes innovation because, ultimately, society benefits more from companies investing in R&E because the spending may yield a new, beneficial product and cheapen the production of related goods and services in the future.

Yet while the United States was one of the first countries to implement such a tax credit, the size of the U.S. subsidy now lags most other Organization for Economic Cooperation and Development (OECD) nations. Moreover, many economists agree that R&D spending by U.S. firms is below socially optimal levels, with some studies suggesting that such spending would have to be doubled to reach its optimal level.[8] Expanding the tax credit would be a common-sense reform to encourage further digital innovation by U.S. firms, and bills that seek to preserve, expand, or simplify the credit usually have bipartisan cosponsors and supporters. For example, the Research and Development Tax Credit Expansion Act of 2019 calls for increasing the small business credit rate to 20 percent, relaxing the eligibility requirements, and expanding the total rebate rate.[9] Similarly, the Support Small Business R&D Act of 2020 called for providing training sessions conducted by the Small Business Administration (SBA) on the tax credit and the legal rules governing it to encourage more firms to use the credit and help them deal with compliance costs.[10]

Increasing Federal Spending on Applied Technology Research

The history of U.S. digital innovation shows that private firms often develop useful products and services based on technology created by government-funded research. Unfortunately, government spending on research relative to Gross Domestic Product (GDP) is in secular

decline. While such spending amounted to 1.2 percent of GDP in 1976, today it only amounts to about 0.7 percent.[13] (In contrast, China's 2020 R&D spending rose 10.3 percent to 2.44 trillion Chinese yuan (about $378 billion) – or to 2.4% of GDP.) This kind of spending also has second- and third-order effects on, say, high-performing students weighing the choice between a passion for attending graduate school for a particular STEM area, versus alternative career paths in, say, business or patent law.

Recent legislation introduced in this area shows that politicians have realized the importance of increasing federal support for research. A virtue of these proposals is that they seek to emulate the market-based, competitive grant making system used by the Defense Advanced Research Projects Agency (DARPA), the renowned research arm of the Defense Department (DoD) that was founded post-Sputnik, which employs program managers with the authority to make high-risk, high-reward grants with modest oversight, and funds different approaches to solving the same challenge initially before deciding which methods are the winners.[12] Similarly, the bipartisan Endless Frontier Act, which passed the Senate as part of the U.S. Competition and Innovation Act, would raise the National Science Foundation (NSF) budget by 150 percent over five years and establish a new technology directorate within the agency that would use a similar, program manager-centric approach for distributing the money.[13] Another beneficial piece of recently proposed legislation is the Innovation Centers Acceleration Act, which would allocate $80 billion over nine years to the NSF to create nine innovation centers as part of an "innovation surge," with the goal of creating new geographic centers of research to complement Boston and Silicon Valley.[14] Lastly, the National Artificial Intelligence Initiative Act provides $6.5 billion specifically for funding AI-related research and development.[15]

Increasing Access to Capital for Small Businesses: Policymakers can also take several steps to increase small business' access to capital – which is a lifeline to staying in business during hard times, and expanding, growing, and innovating in good times. These include increasing access to capital for disadvantaged small business owners, ending accredited investor limits on "private placement" investments in private businesses, and reducing barriers to international data flow and digital commerce.

Increasing Access to Capital for Disadvantaged Small Businesses

There are some legislative proposals to help new businesses gain access to capital. For instance, the Support Small Business R&D Act, introduced in the 116th Congress, would require the SBA and the Internal Revenue Service (IRS) to develop tax credit educational outreach, training, and materials for startups and small businesses that engage in research and could be eligible to use the R&D credit to offset their expenses. (Since new tech businesses rarely show profits, the efficacy of such legislation would be negligible, however.) The New Business Preservation Act, also introduced in the last Congress, would create a new program at the

Treasury Department to partner with states and invest in promising new businesses alongside private investors in areas of the country that do not currently attract significant equity investment in new businesses – with special consideration given to businesses founded by women and people of color. While providing greater access to capital to small businesses that find it difficult to borrow may help diminish the unequal distribution of growth across the country and stave off job migration to the coasts, in a world awash with capital looking for higher returns, it is unclear whether a new public investment initiative will make much of a dent or attract enough attention to become law.

One idea to help the industries hardest hit by the pandemic – such as the travel and restaurant industry – is to create a small business digital innovation tax credit for small and medium businesses that would give them tax credits for investing in new digital tools and services that help them adapt to the post-pandemic environment. But, we also need new concepts to address disparities in access to capital for minority communities and women-owned businesses that will help unleash innovation and drive broader economic growth that go beyond the U.S. Small Business Administration (SBA) Community Advantage loans and micro-loans, the Export-Import (Ex-Im) Bank export financing set aside for small and minority-owned businesses, and federal government contracts set aside for small and minority-owned businesses.

Ending Accredited Investor Limits on Private Placements

The deep capital markets based in the United States, like major stock exchanges and private equity firms, clearly contribute to our leading role in innovation. One reason for the strength of U.S. capital markets is our legal system, which includes comprehensive and detailed rules governing the rights of managers and investors. However, there are changes that can be made to federal securities laws that would provide more efficient markets, particularly with respect to small business capital. If a small or emerging business seeks to raise equity capital without going public, it must qualify for an exemption from the Securities Act's registration requirement. However, the rules governing these exemptions artificially raise the cost and limit the quantity of financing available. The most potentially harmful of these restrictions is the accredited investor limitation on private placements.

Private placements are the most common way that private companies sell securities to "accredited investors." Accredited investors not directly affiliated with the company are institutional investors and wealthy individuals (with $200,000+ in income, or assets excluding primary residence exceeding $1,000,000). The putative reason for the accredited investor rule is that because private offerors are not required to provide the same information disclosures as public offerors, private investors must be able to "fend for themselves." The problem with this reasoning is that wealth is not a good measure of sophistication.[16]

The accredited investor rule essentially has three costs. First, and most importantly, it is especially harmful for early-stage startup businesses, particularly businesses owned by people of color and women, because these businesses are more likely to be overlooked by institutional sources of venture funding. Second, for more mature small businesses, the rule makes funding more expensive, meaning that firms must give up a greater percentage of equity to receive a given amount of funding than they would without the rule, because restricting capital in the private placement market reduces competition amongst purchasers. Short of doing away with the rule entirely, beneficial regulatory proposals include reducing the income and assets threshold, allowing persons who pass Financial Industry Regulatory Authority (FINRA) exams to become accredited, and easing rules that essentially restrict mutual funds from investing in private securities.[17]

Reducing Barriers to International Data Flow and Digital Commerce

Cross-border data flow is critical to modern transatlantic commerce, enabling even the smallest businesses to conduct international marketing and sales. Consequently, restrictions on or regulations of data flow, however well-intentioned, tend to restrict cross-border commerce, which in turn disproportionately hurts smaller businesses who have less resources and rely on digital tools to increase their reach and revenue. A recent report by the Information Technology & Innovation Foundation (ITIF) suggests that a practical new "digital alliance" between the United States and European Union would not only help such commerce, but also have other regulatory and national security benefits. For example, more open cross-border data flows help millions of small and medium-sized businesses (SMBs) use digital tools to reach new markets and transact sales, and help governments conduct regulatory oversight, investigate complex crimes, and protect national security.

Meanwhile, as data becomes more valuable to commerce, many governments across the globe have responded by asserting more control over the data produced in their jurisdiction, which is often referred to as "data nationalism" (or, more broadly, "data localization"). Often, these rules require that companies collecting data in a country also maintain the data in the country, which governments often justify by appealing to the need to ensure cybersecurity or maintain the privacy of citizens. There are certainly a range of legitimate interests – security, sovereignty and human rights, for instance – that can conflict with economic considerations, but broad data localization requirements often amount to little more than "data protectionism" which serves to impede the continued growth of international trade. The U.S. International Trade Commission (USITC) reports that half of all global trade in services depends on access to cross-border data flows.

As governments increasingly impose various data localization rules on banks, tech companies, credit card companies, and other financial institutions, the impact on the global economy grows.

A 2014 study estimated that "foreign digital trade barriers" depressed U.S. gross domestic product by 0.1 to 0.3 percent, which amounts to between $20 and $45 billion per annum. A study by the Center for International Governance Innovation (CIGI) and Chatham House estimated that digital trade barriers reduced GDP by 0.10 percent in Brazil, 0.55 percent in China, 0.48 percent in the EU and 0.58 percent in South Korea. Attempts to regulate this situation through trade agreements have run aground. To some extent these failures reflect the underlying difficulty of reconciling commercial and noncommercial data. Only a fraction of the growing volume of cross-border data flows is of a financial, commercial, or transactional nature. Most personal data take the forms of emails, videos, text messages, and phone calls.

Typically, trade agreements conduct dispute resolution through panels of trade lawyers. But when cross-border data leads to disputes involving civil matters, such as torts, or criminal matters, such as harassment, and when these disputes would normally engage local courts in domestic legal systems, trade lawyers cannot appropriately handle such matters. In addition to the practical difficulties involved in harmonizing enforcement across widely differing domestic judicial systems, the larger Westphalian nation-state principle of noninterference in the internal affairs of other nations presents another obstacle. Nevertheless, for the continued growth of global trade, some type of reciprocated balancing must take place between the needs of global businesses and the prerogatives of sovereign governments. Progress toward new solutions may proceed from awareness that most cross-border data flows are not in fact trade-related.

Conclusions

Some of the key ingredients to the United States' robust postwar economic growth like the increase of women in the workforce, the dramatic expansion of college education, and the strong population growth precipitated by the baby boom have largely dissipated. To ensure that the U.S. economy achieves robust economic growth we need to not only maximize the education, skills, and productivity of our domestic workforce but also do a better job of attracting and retaining skilled immigrants who come to the United States as undergraduate and graduate students and/or are entrepreneurial business owners. While there are politicians who realize the urgency of this situation, the federal government has thus far done too little.

There is hope that the collective urgency of the economic response to the pandemic may serve to eliminate some of these barriers and ignite private-sector innovation: the rapid adoption of new technologies that facilitated remote work and touchless transactions has ignited a wealth of investment into new tools for dealing with the pandemic that may soon become available. Some believe that this period of fecundity may continue beyond the pandemic. However, a period of robust innovation is by no means assured, and we need a concerted political effort if we are to

the strong productivity growth we saw in the 1950s and 1960s and then again in the 1990s and 2000s.

This won't be easy. For starters, some of the necessary tasks to achieve this – such as changing immigration laws – are viewed warily by an increasing proportion of the populace, and entrenched interests often unite to stifle other regulatory actions intended to boost competition and growth. Some people also believe that other issues, such as the size of individual companies, take precedence over innovation and growth. Helping voters understand how growth has the potential to improve their lives is something that too few politicians – or economists – bother to attempt, but such efforts are becoming increasingly important.

At this critical juncture in American history, it's worth considering that had we not had a quarter-century pause in productivity growth from 1971 to 1995 our GDP would be approximately seven trillion dollars higher today. Such a treasure would afford us the ability to come much closer to satisfying the wish lists of politicians on both sides, while paying for pandemic spending and keeping our nation's debt at a manageable level. While we can't change the past, we can – and should – take all prudent steps to encourage more investment in innovation to give ourselves more resources to combat the pressing needs of future societies.

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