



**BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON SCIENCE,  
SPACE, AND TECHNOLOGY**  
**Hearing on “Building Back the U.S. Research Enterprise: COVID Impacts and Recovery”**  
**Testimony of Tom Quaadman, Executive Vice President, U.S. Chamber of Commerce**

**February 25, 2021**

Good morning, Chairwoman Bernice Johnson, Ranking Member Lucas, and distinguished members of the House Science, Space, and Technology Committee. My name is Tom Quaadman and I am the Executive Vice President at the U.S. Chamber of Commerce’s<sup>1</sup> Center for Capital Markets Competitiveness (CCMC), Chamber Technology Engagement Center (C\_TEC), and the Global Innovation Policy Center (GIPC).

Now in its second year, the COVID-19 pandemic represents one of the greatest challenges to the United States in the 21<sup>st</sup> century, leading to more than 500,000 fatalities in the U.S., affecting nearly every facet of our everyday lives, and crippling millions of small businesses.

Innovation is the key to enabling the United States to emerge from the pandemic, spurring economic recovery, creating jobs, and continuing America’s global leadership. The private sector is leading, and in many cases, is collaborating with academia and the public sector such as on advanced pharmaceuticals like the COVID-19 vaccines. Technologies such as artificial intelligence are helping solve many of the problems we are facing today, like accelerating drug discoveries and enabling our understanding of the virus. Broadband and the Internet are keeping the digital lights on for businesses, enabling children to learn in virtual classrooms, and enabling us get medical care through telehealth. At the same time, Congress will need to undertake an urgent effort to modernize government information technology infrastructure to help us solve problems like vaccine distribution in real-time, advance leadership in key emerging technologies, and bridge the digital divide. Fundamental to these critical and society-sustaining technologies is a healthy and robust research and development (“R&D”) ecosystem.

However, America’s national research enterprise, a world-class network of federal agencies, colleges and universities, and industry labs, has not remained untouched by the pandemic. This issue will need to be addressed by policymakers as we continue to grapple with the numerous challenges associated with COVID-19. In addition to this issue, this testimony examines industry’s overall role in facilitating R&D, key challenges and opportunities, reasons to prioritize investments in R&D, importance of tax policy and intellectual property protections, and policy

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<sup>1</sup> The U.S. Chamber of Commerce is the world’s largest business federation, representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations. The Chamber is dedicated to promoting, protecting, and defending America’s free enterprise system.

recommendations for Congress to bolster our national research enterprise, and sustain America’s leadership in R&D. Congressional leadership in this area that has been most effective and stood the test of time, such as the Bayh-Dole Act and the Leahy-Smith America Invents Act, have been bipartisan efforts and we hope this Congress continues that tradition.

## **I. IMPACT OF COVID-19 ON THE NATIONAL RESEARCH ENTERPRISE**

Last September, this Committee’s Research and Technology Subcommittee held a hearing on the adverse impact of COVID-19 on university research, finding that the pandemic has affected universities’ ability to conduct research through reduced physical access to university laboratories, caused pauses to on-going research, and led to staff reductions, among other significant impacts.<sup>2</sup> Moreover, much of academia has implemented hiring freezes and consequently, science, technology, engineering, and mathematics (“STEM”) faculty job openings have decreased by 70% compared to 2019.<sup>3</sup> Over the long term, and without a course correction, the impacts of COVID-19 on academic research will have negative ramifications on America’s economic competitiveness.

Members of Congress, such as Representatives Diana DeGette and Fred Upton, have appropriately recognized the threat COVID-19 poses to our national research enterprise through the introduction of the Research Investment to Spark the Economy (“RISE”) Act, which would provide support to America’s research enterprise.<sup>4</sup> This bipartisan solution would allocate \$25 billion across several federal agencies to supplement research grants and contracts, sustain core research facilities that have been shuttered by the pandemic, and mitigate the impact on graduate students and other early-career researchers through additional opportunities. The U.S. Chamber supports the RISE Act’s goals and urges the Committee and Congress to advance this bipartisan legislation and other initiatives to protect our national research enterprise and sustain America’s long-term economic competitiveness.

## **II. LONG-TERM CHALLENGES TO U.S. GLOBAL COMPETITIVENESS**

While the nation continues to grapple with the effects of COVID-19, policymakers must take the long-view and look ahead to the wide range of challenges and opportunities the country will face over the next few decades.

The national research enterprise is a crucial building block of America’s global economic competitiveness and national security. Fortunately, due to our world-class universities and

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<sup>2</sup> The impact of the COVID-19 crisis on university research. Hearings before the Subcommittee on Research and Technology, of the House Committee on Science, Space, and Technology. 116th Cong. (2020). <https://science.house.gov/hearings/the-impact-of-the-covid-19-crisis-on-university-research> (accessed February 18, 2021).

<sup>3</sup> Katie Langin. Amid pandemic, U.S. faculty job openings plummet. Sciencemag.org, American Association for the Advancement of Science. October 6, 2020. <https://www.sciencemag.org/careers/2020/10/amid-pandemic-us-faculty-job-openings-plummet#:~:text=Faculty%20job%20openings%20at%20U.S.%20institutions%20are%20down%20by%2070,dates%20with%20no%20new%20postings> (accessed February 18, 2021).

<sup>4</sup> RISE Act, H.R. 7308, 116th Cong. §2 (2020). <https://www.congress.gov/bill/116th-congress/house-bill/7308> (accessed February 18, 2021).

innovative private sector, America’s research capabilities remain the envy of the world and exceed that of the nation’s economic competitors. However, U.S. leadership is no longer assured. China, the European Union and others are intently focused on dislodging the United States from its unquestioned leadership position at the commanding heights of global innovation. China, in particular, is rapidly investing in research and development, endeavoring to build self-sufficiency in foundational technologies, and achieve absolute dominance in emerging technologies and industries of the future. According to the American Association for the Advancement of Science, the annual growth in R&D expenditures, public and private since 1995, in the United States rests at roughly 3.5%. However, China’s growth rate exceeds 15% and has reached \$463 billion in 2018.<sup>5</sup> It is imperative that policymakers come together on a bipartisan basis to address these immense challenges.

### **III. OVERVIEW OF U.S. RESEARCH AND DEVELOPMENT ACTIVITIES**

Since the end of World War II, the United States has been a global leader in conducting R&D, consisting of roughly 69% of the total spent globally in the immediate post-war period, involving significant collaboration and investments from the public and private sectors.<sup>6</sup> Today, while the United States spends \$580 billion annually, our global share of R&D spending has fallen to 27.7% reflecting significant progress made by other countries to compete with the United States.<sup>7</sup> Stakeholders, including industry, academia, and the federal government, all play important roles across the spectrum of R&D activities and all need to be successful for the America’s research enterprise to continue the lead the world in innovation.

R&D encompasses a number of different activities, including basic research, applied research, and development. In the aggregate, these activities lead to the private sector commercialization of new products and processes and the creation of new industries and American jobs. Basic research, also called fundamental research, includes experimental and theoretical research to garner a stronger understanding of natural phenomenon, and develop scientific theories. Applied research seeks to address particular problems and utilize that research for specific products and processes. Finally, development utilizes research gained from basic and applied search to create or improve new products and processes.<sup>8</sup>

For example, the Defense Advanced Research Projects Agency (“DARPA”) collaborated with academia and the National Science Foundation to develop the protocols and initial infrastructure that laid the basic foundation for the modern-day internet. The private sector though has been

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<sup>5</sup> Matt Hourihan. A snapshot of U.S. R&D competitiveness: 2020 update. R&D Budget and Policy Program, American Association for the Advancement of Science. (2020): <https://www.aaas.org/sites/default/files/2020-10/AAAS%20International%20Snapshot.pdf> (accessed February 18, 2021).

<sup>6</sup>Congressional Research Service. (2020, January 24). *U.S. research and development funding and performance: fact sheet*, CRS Report No. R44307 (1). <https://crsreports.congress.gov/product/pdf/R/R44307> (accessed February 18, 2021).

<sup>7</sup>Ibid, 2-3.

<sup>8</sup>Ibid, 3.

responsible for connecting the vast majority of Americans online and technology companies have brought e-commerce, virtual learning, and telehealth into the mainstream.

### **The COVID-19 Vaccine: A Case Study in the Intersection of Basic Research and Private Sector Innovation**

The development of a COVID-19 vaccine provides an instructive example of how basic research ultimately feeds in the creation of new and innovative commercial products and how government, academia, and the private sector can collaborate to address critical challenges.

The Pfizer and Moderna COVID-19 vaccines both utilize a fairly novel technology called synthetic messenger RNA or mRNA. Researchers at University of Pennsylvania, Katalin Kariko and Drew Weissman, spent over a decade conducting research on synthetic mRNA and published the findings in 2005. This foundational research inspired founders of Moderna to use mRNA for medicines and raised \$2 billion on the concept before going public in 2018. Soon after the world became aware of the COVID-19 virus, Moderna researchers used the mRNA technique to create a vaccine and was one of the first drugmakers to develop a vaccine suitable for clinical trials. Operation Warp Speed, through funding appropriated by the CARES Act, provided Moderna with \$2.58 billion in two grants to facilitate development of their vaccine.

Likewise, Pfizer and its German partner BioNTech also utilized mRNA to develop a COVID-19 vaccine. BioNTech similarly licensed the novel technology developed at the University of Pennsylvania to try to harness the medical potential of mRNA. At the onset of the pandemic, BioNTech partnered with Pfizer, an 171 year old biopharmaceutical company, to develop and test their mRNA vaccine candidate. While Pfizer did not receive R&D funding through Operation Warp Speed, the federal government agreed to pay \$1.95 billion to purchase 100 million doses of the vaccine.

Federal support for basic research is not the only public policy whose benefits are highlighted by the new vaccines. Immigrant innovators were often the tip of the spear, and the ability of firms to draw on global production networks sourcing inputs from around the globe has proven essential to the development and deployment—with unprecedented speed—of these novel and impressive vaccines. There are important lessons here for elected officials considering the direction of U.S. immigration, trade, and supply chain policies.

Last December, the Food and Drug Administration granted emergency use authorizations for both the Pfizer-BioNTech and Moderna mRNA-based vaccines. The story of both vaccines illustrates how basic federal funding – for either R&D or the medicines themselves – paired with private sector expertise can lead to game-changing medical innovations in record time.

#### **i. Stakeholder Contributions to the National Research Enterprise**

Academia, industry, and the federal government are all essential components of America's research enterprise and uniquely contribute to the nation's collective R&D activities. In 2018,

academic institutions contributed \$20.4 billion of R&D activity, 62% of which went to basic research and 25% of which went to applied research.<sup>9</sup> The Federal government invested \$127.2 billion in R&D, 42% of which went to basic research and 34% towards applied research.<sup>10</sup>

Industry constitutes the largest share of all types of R&D funding in the United States, specifically **69.7% or \$404.2 billion annually**. Although it is unsurprising that industry produces the vast majority, or 85.2%, of all development research considering the crucial role the private sector plays in developing new products and services, industry also makes substantial contributions to basic research (29%) and applied research (54.3%).<sup>11</sup>

Finally, the Federal government, the private sector, and academia frequently collaborate on R&D initiatives through shared resources and funding opportunities. For example, the federal government and industry contribute, 41.9% and 4.7% respectively, to academic institutions for R&D expenditures.<sup>12</sup> Overall, 55% of all federal R&D expenditures is performed by either academia or industry underscoring the importance of stakeholder partnerships. Policymakers should continue to prioritize these stakeholder partnerships and ensure that academia, industry, and the federal government has a seat at the table in determining how to strengthen America's research enterprise.

## **ii. Decline of Federally-Funded Basic Research**

While academia, the federal government, and industry continue to make significant investments in R&D, a concerning trend line exists, which will put America's global competitiveness at risk if not sufficiently addressed. Federal R&D expenditures as a percentage of the federal budget currently rest at 2.8%, a 60-year low.<sup>13</sup> The share of private sector expenditures of R&D expenditures has increased from 32.3% in 1965 to 69.7% today.<sup>14</sup> The decline in federal R&D investment has negatively impacted basic research, considering that the federal government, and by extension, academia, is primarily responsible for conducting that type of research. Given the foundational role basic research plays in facilitating applied and development research, and subsequently new and improved products and services, the current trend will likely limit industry's future capability to innovate and commercialize innovations stemming from scientific advancements. In turn, this will put the United States at a global disadvantage compared to other countries, such as China, which is increasingly prioritizing funding for R&D. To address this

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<sup>9</sup>Josh Trapani and Michael Gibbons. Academic Research and Development. National Science Board, Science and Engineering Indicators 2020, National Science Foundation, Report NSB-2020-2.

<https://nces.nsf.gov/pubs/nsb20202/academic-r-d-in-the-united-states> (accessed February 18, 2021).

<sup>10</sup>Congressional Research Service. (2020, January 24). *U.S. research and development funding and performance: fact sheet*, CRS Report No. R44307 (3). <https://crsreports.congress.gov/product/pdf/R/R44307> (accessed February 18, 2021).

<sup>11</sup>Ibid, 3.

<sup>12</sup>Josh Trapani and Michael Gibbons. Academic Research and Development. National Science Board, Science and Engineering Indicators 2020, National Science Foundation, Report NSB-2020-2.

<https://nces.nsf.gov/pubs/nsb20202/academic-r-d-in-the-united-states> (accessed February 18, 2021).

<sup>13</sup>James Pethokoukis. "U.S. federal research spending is at a 60-year low. Should we be concerned?" The American Enterprise Institute (blog), May 11, 2020. <https://www.aei.org/economics/us-federal-research-spending-is-at-a-60-year-low-should-we-be-concerned/> (accessed February 18, 2021).

<sup>14</sup>Ibid.

risk, the Chamber believes that Congress, on a bipartisan basis, should seek to reverse this trend and prioritize federal investments in R&D, especially in basic research.

#### **IV. IMPORTANT PURPOSES AND APPLICATIONS OF RESEARCH & DEVELOPMENT**

As has been discussed, R&D investments are necessary to enable the development and ultimate commercialization of innovative products and services. Federal research in the 1950s, for example, led to the development of GPS by the U.S. Department of Defense. Today, GPS is utilized across a number of economic industries including the aviation and automotive sectors, and has led to creation of new business models and products such as on-demand ridesharing and smartphones. However, investments in R&D also yield a number of additional benefits outside of novel commercial applications important to the long-term success of the United States.

##### **i. Addressing the COVID-19 Pandemic**

Investments in R&D are helping to address critical challenges facing the nations and the world such as COVID-19. In addition to the contributions of R&D to the development of mRNA-based COVID-19 vaccines, public-private partnerships such as the COVID-19 HPC Consortium leverage the supercomputing resources of industry and federal laboratories to combat COVID-19 with research through supporting dozens research projects including accelerating drug discovery, identify appropriate therapies for COVID-19 patients, and understand the virus.<sup>15</sup>

##### **ii. Driving Climate and Energy Innovation**

Addressing climate change is a priority for the business community and one where federal support plays a crucial role. Governments at all levels and businesses of all sizes are committed to taking on the challenge of climate change, and in recent years have announced a growing number of ambitious energy transition goals. The development and commercialization of new low-carbon technologies will be the primary factor that determines whether these goals can ultimately be achieved.

That is where the federal government's role is essential, and why the Chamber worked closely with this Committee last Congress as it played a major role in passage of the Energy Act of 2020. Arguably the most important climate and energy legislation to pass Congress in over a decade, this law expands federal efforts in a broad suite of technology areas, including energy storage, advanced nuclear, and carbon, capture, utilization, and storage to industrial technologies and grid modernization research.<sup>16</sup>

The Energy Act of 2020 is exactly the “kitchen sink” approach to climate technology solutions the nation needs, and it passed in bipartisan fashion, proving that there is common ground on which all sides of the debate can come together to address climate change. More importantly, however, it also presents a major long-term growth opportunity for U.S. businesses. With the

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<sup>15</sup>COVID-19 HPC Consortium, <https://covid19-hpc-consortium.org/> (accessed February 18, 2021).

<sup>16</sup> Energy Act of 2020, Section-by-Section. Senate Committee on Energy and Natural Resources. 116th Congress. (2020). <https://www.energy.senate.gov/services/files/32B4E9F4-F13A-44F6-A0CA-E10B3392D47A> (accessed February 18, 2020).

federal government providing the foundation, we can restore American leadership in clean energy innovation and take advantage of immense opportunities to export climate change solutions to the rest of the world.

### **iii. Strengthening National Security**

A strong research enterprise is essential to strengthen our national security, both through federally-funded and private sector investments. In Fiscal Year 2020, the U.S. Department of Defense constitutes a significant share of federal R&D funding, 44.3% of all federal R&D spending.<sup>17</sup> Critically, much of these activities are carried out by industry and academia, highlighting the importance of public-private R&D collaboration to sustain national security.

5G security has emerged as crucial example of how investments in R&D can strengthen national security through securing our telecommunications networks. Section 501 in the Fiscal Year 2021 National Defense Authorization Act (S. 4029) established the Public Wireless Supply Chain Innovation (“R&D”) Fund and the Multilateral Telecommunications Security (“MTS”) Fund.<sup>18</sup> These programs will promote U.S. leadership, competitiveness, and supply chain security in 5G, a critical backbone for future economic growth. The R&D Fund would provide grants to companies to develop and deploy Open RAN technologies, while the MTS Fund would support the global development and deployment of secure and trusted telecommunications in consultation with America’s foreign partners.<sup>19</sup>

### **iv. Ensuring American Leadership in Industries of the Future**

Industries of the future, including artificial intelligence (“AI”), quantum information science, semiconductors, and advanced communications technologies like 5G will be long-term drivers of global innovation. United States leadership in these technologies is essential to maintaining global competitiveness and national security, and continued prioritization of industries of the future for R&D will be key achieving that objective.

Congress, primarily through the work of this Committee, has demonstrated significant bipartisan leadership in charting a path forward for these important technologies. Last year, the Fiscal Year 2021 National Defense Authorization Act (“NDAA”), included the bipartisan CHIPS for America Act to boost federal investments in semiconductors.<sup>20</sup> The CHIPS for America Act will help reverse the decline in semiconductor manufacturing in the United States. Semiconductors are essential in a host of cutting-edge technology fields and essential to U.S. economic and national security; currently 9 out of 10 top public companies by market cap are dependent on a strong semiconductor sector. Also, the impact of the ongoing semiconductor shortage on the automotive sector has demonstrated how critical other industry sectors are on semiconductors

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<sup>17</sup>Congressional Research Service. (2020, March 18). *Federal research and development funding: FY2020*, CRS Report No. R45715 (4) <https://fas.org/sgp/crs/misc/R45715.pdf> (accessed February 18, 2021).

<sup>18</sup>National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. TITLE XCII, §9202 (2020). <https://www.congress.gov/bill/116th-congress/house-bill/6395/text> (accessed February 18, 2021).

<sup>19</sup>U.S. Chamber of Commerce (2020, August 19). NTIA comments on national strategy to secure 5G. <https://www.uschamber.com/comment/ntia-comments-national-strategy-secure-5g> (accessed February 18, 2021).

<sup>20</sup> National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. TITLE XCIX (2020). <https://www.congress.gov/bill/116th-congress/house-bill/6395/text> (accessed February 18, 2021).

and how federal support and investment is crucial to strengthening the resilience of semiconductor supply chains.<sup>21</sup>

The NDAA also included the National Artificial Intelligence Initiative Act, comprehensive bipartisan legislation to establish a multi-billion national R&D initiative for AI, centered around programs at the National Science Foundation, the Department of Commerce, and the Department of Energy. The legislation also created a task force to investigate the feasibility of creating a national AI research cloud, which will enable academia, industry, and the federal government to share computing resources, reduce the cost of compute for researchers, and facilitate collaboration on key AI challenges.<sup>22</sup> This legislation is critical to ensuring U.S. global leadership in AI and providing a strong foundation to address the risks and opportunities posed by this technology.

#### **v. Supporting Standards Development and Rules of the Road**

Industry-led, voluntary consensus standards are a bedrock in establishing a common baseline of understanding that can inform regulatory actions and ensuring U.S. leadership internationally on standards and rules of the road. The federal government, primarily through the Department of Commerce’s National Institute of Standards and Technology (“NIST”) contributes to the development of standards through providing technical expertise, but also conducts research activities to establish the technical foundation for standards. In addition, NIST plays an important coordination role in convening relevant stakeholders and identifying gaps in research necessary to develop a particular standard. Ultimately, NIST’s work is important to the free enterprise system considering industry relies on standards to reduce the cost of product development, expedite market entry, and open new markets at home and abroad. Moreover, the United States benefits when industry and the federal government effectively influences the development or revision of international technology standards.

For example in the AI space, the National Artificial Intelligence Initiative Act tasked NIST to lead the process in establishing a voluntary and stakeholder-driven risk management framework for AI, a concept based on the NIST’s Cybersecurity Framework. The AI risk management framework will establish common definitions for key terms pertaining to AI trustworthiness such as bias, explainability, and ethics, as well as providing and identifying relevant standards and other processes to develop, assess, and mitigate risks regarding trustworthy AI.<sup>23</sup> Cross-disciplinary research conducted by academic, federal government, and industry stakeholders will help inform the development of the framework. Ultimately, the framework will serve as an important tool to ensuring that all stakeholders are part of the discussion to determine how to appropriately manage risks stemming from AI while guaranteeing the United States remains at the forefront of innovation.

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<sup>21</sup>Marcus Williams. Semiconductor shortage will hit auto industry well into 2021. Automotive Logistics. January 19, 2021. <https://www.automotive-logistics.com/news/semiconductor-shortage-will-hit-auto-industry-well-into-2021/41476.article> (Accessed February 18, 2021).

<sup>22</sup>National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. Division E, TITLE LI, §5106 (2020). <https://www.congress.gov/bills/116/house-bills/6395/text> (accessed February 18, 2021).

<sup>23</sup> National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. Division E, TITLE LIII, §5301 (2020). <https://www.congress.gov/bills/116/house-bills/6395/text> (accessed February 18, 2021).



## V. THE NEED TO REPEAL A HARMFUL R&D TAX CHANGE

Beginning in 2022, businesses in the United States will no longer be able to immediately deduct their R&D expenses and will instead be required to deduct or amortize these expenses over several years. This policy would make the United States a global outlier on how R&D is treated.<sup>24</sup> It is imperative that Congress act to maintain the ability to immediately deduct these expenses, thereby encouraging continued investment and innovation within our borders.

Private sector R&D investments in the United States drive economic and job growth. Further, for every \$1 billion in private sector R&D spending, 17,000 jobs are supported in the United States.<sup>25</sup> These R&D-related jobs pay an average annual wage of nearly \$135,000.<sup>26</sup> We must maintain immediate deductibility for R&D expenses to ensure the United States can remain a leader in innovation and the job and economic growth that comes with R&D investments.<sup>27</sup>

## VI. ROLE OF INTELLECTUAL PROPERTY RIGHTS TO INNOVATIVE R&D

The strength of the U.S. patent system is a key driver of private sector investment in R&D and a fundamental underpinning for America's competitive advantage in innovation. The private sector relies on the legal certainty of U.S. intellectual property (IP) rights to make long-term, high-risk, capital-intensive investments in innovation (e.g., in the bio-pharmaceutical sector nine of ten prospective medicines entering clinical trials will fail and the one that succeeds may take a decade of development and testing at a cost of billions of dollars before ever reaching a patient).

In a ranking of countries accounting for more than 90 percent of global GDP, the U.S. Chamber International IP Index<sup>28</sup> (the "Index") has consistently scored the United States as the leading IP system in the world, measured by strength of rights, predictability, reliability and access to due process. Moreover, analysis of Index data<sup>29</sup> has demonstrated highly positive correlations between a country's IP strength and its performance against indicators such as innovative and creative output, access to innovation and creativity, and job creation in knowledge-intensive industries, among a number of other socio-economic goals.

This advantage has contributed to make the United States uniquely successful in translating both public and private investments in basic research into usable end-products, a process referred to as commercialization. According to the Small Business Administration, "Early stage small businesses face difficult challenges accessing capital, *particularly those without the necessary*

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<sup>24</sup>Ernst & Young. Impact of the amortization of certain R&D expenditures on R&D spending in the United States. (ii). October, 2019. <https://investinamericasfuture.org/wp-content/uploads/2019/10/EY-RD-Coalition-TCJA-R-and-D-amortization-report-Oct-2019-1.pdf> (Accessed February 18, 2021).

<sup>25</sup> Ibid, 12.

<sup>26</sup> Ibid, 10.

<sup>27</sup> For additional background, discussion, fact sheets, and relevant data, please visit the R&D Coalition website, available at <https://investinamericasfuture.org/>.

<sup>28</sup> U.S. Chamber International IP Index, Eighth Edition. February 2020. [www.uschamber.com/ipindex](http://www.uschamber.com/ipindex) (accessed February 18, 2021).

<sup>29</sup> [https://www.theglobalipcenter.com/wp-content/uploads/2019/02/023593\\_GIPC\\_IP\\_Index\\_2019\\_Annex.pdf](https://www.theglobalipcenter.com/wp-content/uploads/2019/02/023593_GIPC_IP_Index_2019_Annex.pdf); Statistical Analysis of the U.S. Chamber International IP Index. February 2019.

*assets* or cash flow for traditional bank funding.”<sup>30</sup> (emphasis added) For innovative start-ups and small businesses—who face a particularly acute challenge due to the inherent technical risks of commercializing unproven technologies—intellectual property rights are the indispensable assets necessary for access to capital.

Licensing of IP rights, which in turns depends on their predictability and reliability, further sustains an ecosystem for innovation by providing a basis for financing, collaboration, and technology transfer among diverse partners, from government, to universities, to start-ups, to larger companies with the ability to test and manufacture at scale. Patents, in essence, form the currency which allows for exchanges of value within this innovation ecosystem.

By allowing the assignment of intellectual property rights derived from federally-funded grants to be licensed to the academic and private sector researchers who make the relevant discoveries, the **1980 Bayh-Dole Act** became a critical element of U.S. R&D success in recent decades. Bayh-Dole established a fair, appropriate, and pragmatic system for the federal government to transfer proprietary rights in research. It has been critical to the success of the United States in bridging the “valley of death” and ensuring that scientific knowledge translates into usable products, services, and technologies that both serve end-users and advance national strategic priorities.

## **VII. POLICY RECOMMENDATIONS**

The COVID-19 pandemic has demonstrated glaring vulnerabilities in our national research enterprise, which if not addressed, will pose a long-term risk to U.S. competitiveness. Moreover, the decline in federally-funded basic research and increased geopolitical competition from China and others underscores the necessity for Congress on a bipartisan basis to take the lead in bolstering our R&D capabilities.

The Chamber recommends that Congress take the following actions to support our national research enterprise during the pandemic and leverage R&D to support the long-term competitiveness of United States:

- Enact the RISE Act to mitigate the impact of COVID-19 on our national research enterprise and lay the foundation for future discoveries and innovations.
- Ensure that recently-enacted R&D legislation, including the National Artificial Intelligence Initiative Act, CHIPS for America Act, and the Energy Act of 2020, are fully funded.
- Increase funding for the Technology Modernization Fund and other programs in order to digitally transform government. Modernizing government platforms will enable greater real-time collaboration between government and the private sector and strengthen the federal government’s research capacity.

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<sup>30</sup> <https://www.sba.gov/offices/headquarters/ooi/resources/34981> (accessed February 18, 2021)

- Identify additional opportunities to establish new programs or strengthen existing programs to reverse the decline in federal investments in R&D, with a particular focus on basic research.
- Maintain the ability to immediately deduct R&D expenses.
- Enable private sector R&D investment through a recommitment to the predictability and reliability of the U.S. patent system.

## **VIII. CONCLUSION**

The Chamber appreciates the opportunity to discuss COVID-19's impact on our national research enterprise and on how research and development activities strengthens American competitiveness. America's business community looks forward to continuing to work with the Committee and its members on solutions to address the adverse impact of COVID-19 and other crucial policies to unleash American innovation.

# Tom Quaadman

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Thomas Quaadman is executive vice president of the U.S. Chamber [Center for Capital Markets Competitiveness](#) (CCMC), the [Chamber Technology Engagement Center](#) (C\_TEC), and the [Global Innovation Policy Center](#) (GIPC).

CCMC was established in March 2007 to advocate legal and regulatory policies for the U.S. capital markets to advance the protection of investors, promote capital formation, and ensure U.S. leadership in the financial markets in the 21st century. Quaadman oversees the Center's policy and lobbying operations. He also works with CCMC staff to create and execute legislative, regulatory, and judicial strategies to reform the financial regulatory system and support policies for efficient capital markets.

C\_TEC was established to tell the story of technology's role in our economy and advocate for rational policy solutions that drive economic growth, spur innovation, and create jobs through the backing of a leading national and global business organization.

And GIPC works around the world to champion innovation and creativity through intellectual property standards that create jobs, save lives, advance global economic and cultural prosperity, and generate breakthrough solutions to global challenges.

Quaadman headed the Chamber's efforts on the Dodd-Frank Wall Street Reform and Consumer Protection Act and the Jumpstart Our Business Start-Ups Act (JOBS Act). In addition, he formed and managed several coalitions, including the Corporate Governance Coalition for Investor Value and the FIRCA coalition on the convergence of domestic and international accounting rules. In directing the Chamber's work on corporate governance, Quaadman led successful

efforts to overturn the SEC's proxy access rules and have a portion of the Conflict Minerals Rule declared unconstitutional.

He has testified on a number of occasions before congressional committees on issues covering capital formation, financial reporting, and corporate governance. He also led the business outreach efforts for the Working Group on U.S. RMB Clearing and Trading. In 2012, *Treasury & Risk* magazine named Quadman as one of the top 100 influential people in finance.

Quadman graduated cum laude from New York Law School and is a graduate of the College of Staten Island. He is a member of the New York and Connecticut state bars. Quadman and his wife, Tara, and their children, Creighton and Alexandra, reside in Alexandria, Virginia.