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116TH CONGRESS *2d Session*	SENATE	REPORT 116–332

RESEARCH INVESTMENT TO SPARK THE ECONOMY ACT OF 2020

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ON

S. 4286

DECEMBER 15, 2020.—Ordered to be printed

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

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RESEARCH INVESTMENT TO SPARK THE ECONOMY ACT OF 2020

DECEMBER 15, 2020.—Ordered to be printed

Mr. WICKER, from the Committee on Commerce, Science, and Transportation, submitted the following

R E P O R T

[To accompany S. 4286]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 4286) to authorize appropriations for offsetting the costs related to reductions in research productivity resulting from the coronavirus pandemic, having considered the same, reports favorably thereon with an amendment (in the nature of a substitute) and recommends that the bill (as amended) do pass.

PURPOSE OF THE BILL

This bill would authorize the Departments of Agriculture, Commerce, Defense, Education, Energy, Interior, Health and Human Services, and Transportation and the National Aeronautics and Space Administration, National Science Foundation, and Environmental Protection Agency to provide support for research regarding or disrupted by the 2019 coronavirus (COVID–19) pandemic.

BACKGROUND AND NEEDS

Research and the U.S. Economy

U.S. investment in research and innovation has enabled the United States to become the strongest economy in the world.[1] More than half of the economic growth in the United States during the first half of the 20th century was due to technological advance-

[1] Walter Isaacson, "How America Risks Losing Its Innovation Edge," *Time*, Jan. 3, 2019 (https://time.com/longform/america-innovation/) (accessed Nov. 6, 2020).

ments.[2] A primary driver of future economies and job creation will be innovation that is made possible through advances in science and engineering.[3] In the 20th century, basic research funded by the Federal Government in areas from genomics to engineering have enabled entirely new industries. From the Manhattan Project during World War II to today's advances in the global positioning system (GPS), scientific discovery has allowed the United States to maintain a strategic advantage in times of war. While the United States has long retained its competitive advantage in research and development (R&D) spending, experts believe that China surpassed the United States in terms of R&D investment in 2019.[4] China's annual R&D growth rate is three times higher than that of the United States.[5]

Federal Research and Development Enterprise

The Federal R&D enterprise includes Government facilities and employees and federally funded work in the private, nonprofit, and academic sectors. In fiscal year (FY) 2019, $141.5 billion of Federal funds were obligated for R&D, $39.6 billion for intramural and $101.9 billion for extramural R&D.[6] The United States' R&D enterprise has helped America become the global leader in innovation, while simultaneously strengthening the health of its citizens, national security, and economy. The Institute for Research on Innovation and Science (IRIS) estimates that American university research spending alone contributed to nearly $14 billion in direct cost research dollars towards goods and services in all 435 congressional districts from FY 2018 to FY 2019.[7]

Impacts of COVID–19 on Federal R&D

Throughout 2020, the United States implemented a number of measures to stop the spread of a contagious and deadly coronavirus, SARS–CoV–2 (COVID–19). One of those measures was the implementation of social distancing requirements, limiting close contact between individuals to reduce the risk of spreading the virus. Because of social distancing requirements, many Federal and non-Federal institutions closed their facilities. While many of these institutions transitioned to a telework environment, not all R&D operations have been able to make this transition, as some R&D activities require physical access to facilities and equipment. This has led many federally funded R&D organizations to stop or significantly reduce operations.[8]

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[2] Robert M. Solow, "Technical Change and the Aggregate Production Function," *The Review of Economics and Statistics*, 39: No. 3, 312–320, Aug. 1957.

[3] Dr. Charles M. Vest, *Rising Above the Gathering Storm Revisited: Rapidly Approaching Category 5*, National Academy of Sciences, 2010.

[4] Andrea Widener, "China May Have Pulled Ahead of US in Race for Top Spot in Global Science R&D," *C&EN*, Jan. 15, 2020 (https://cen.acs.org/policy/research-funding/China-pulled-ahead-US-race/98/i3) (accessed Nov. 6, 2020).

[5] Ibid.

[6] National Science Foundation, "Survey of Federal Funds for Research and Development: Fiscal Years 2018–19," Table 2, Feb. 2021 (https://ncsesdata.nsf.gov/fedfunds/2018/) (accessed Nov. 6, 2020).

[7] Institute for Research on Innovation and Science, "The Impact of American University Research Spending," Apr. 2020 (https://iris.isr.umich.edu/wp-content/uploads/2020/04/IRISresearchspendingfactsheet4-20_final.pdf) (accessed Nov. 6, 2020).

[8] Daniel Morgan and John Sargent Jr, *Effects of COVID–19 on the Federal Research and Development Enterprise*, CRS Report R46309 (https://crsreports.congress.gov/product/pdf/R/R46309) (accessed Nov. 6, 2020).

For the R&D operations that have not stopped, researchers and associated staff may be confronted with other challenges: reduced efficiency and quality of work, additional cost for materials, and shifts in the focus of R&D.[9] Social distancing requirements have required some research teams to implement staggered shift schedules, reducing the ability of teams to collaborate, and may require additional time to clean down stations between shifts.[10] Projects may also be stalled by disruptions to the supply of materials and equipment or by closures at collaborating research institutions. Continuing operations may also come with extra costs, requiring institutions to purchase additional computing and networking equipment and services to accommodate researchers working remotely.[11] Institutions have had to purchase additional personal protective equipment at higher costs to replenish supplies that were donated to hospitals and first responders or to meet new lab safety requirements.[11] Institutions have also faced increased prices for materials and equipment that are in short supply due to disturbances in supply chains or heightened demand.[12]

Because impacts of COVID–19 on federally funded R&D have varied across institutions, geographic locations, and scientific disciplines, it is difficult to estimate research output losses nationwide. Closures and social distancing requirements are at the discretion of individual agencies and research institutions and State and local policies, not based on national policies. Additionally, depending on the nature or stage of a project, some researchers have been able to continue to make progress remotely.[14] For example, researchers may be able to perform scientific computations or modeling and simulations while teleworking, or shift to analyzing data and preparing results for submission to scientific journals.[15] In contrast, some research requiring the handling of samples, operation of specialized equipment, or field work has not progressed. This sit-

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[9] Ibid.

[10] Ibid; Kelly Servick et al., "Labs Go Quiet as Researchers Brace for Long Term Coronavirus Disruptions," *Science*, Mar. 16, 2020 (https://www.sciencemag.org/news/2020/03/updated-labs-go-quiet-researchers-brace-long-term-coronavirus-disruptions) (accessed Nov. 6, 2020); Justin Chen, "COVID–19 Has Shuttered Scientific Labs. It Could Put a Generation of Researchers at Risk," STAT, May 4, 2020 (https://www.statnews.com/2020/05/04/coronavirus-lab-shutdowns-impact-on-scientists-research-delays/) (accessed Nov. 6, 2020).

[11] Council on Governmental Relations, *Research Impact Under COVID–19: Financial Crisis and the "Pandemic Normal,"* Aug. 2020 (https://www.cogr.edu/sites/default/files/Research_COVID_August2020_COGR_FINAL.pdf) (accessed Nov. 6, 2020); prepared statement of Dr. Joseph Walsh, Interim Vice President for Economic Development and Innovation, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Walsh%20Testimony.pdf) (accessed Nov. 6, 2020).

[12] Ibid.

[13] Daniella Diaz et al., "Protective Equipment Costs Increase Over 1,000% Amid Competition and Surge in Demand," Cable News Network, Apr. 16, 2020 (https://www.cnn.com/2020/04/16/politics/ppe-price-costs-rising-economy-personal-protective-equipment/index.html) (accessed Nov. 6, 2020).

[14] Prepared statement of Dr. David Stone, Vice President for Research, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology, of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Stone%20Testimony.pdf) (accessed Nov. 6, 2020).

[15] Prepared statement of Dr. Joseph Walsh, Interim Vice President for Economic Development and Innovation, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology, of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Walsh%20Testimony.pdf) (accessed Nov. 6, 2020).

uation is unlikely to change until social distancing requirements are lifted.[16]

The Council on Governmental Relations (CGR) has designed a model to estimate the impacts of COVID–19 on the U.S. research enterprise.[17] From five case studies, the model showed that projected research output losses from March 2020 to February 2021 are between 20 and 40 percent.[18] These results suggest that financial disinvestment impact may be in the hundreds of millions of dollars at individual institutions, and tens of billions of dollars across the research enterprise.[19] These results are consistent with the testimony provided by the Director of the National Institute of Health (NIH) during a Senate Health Education Labor and Pensions Committee hearing, where he estimated that $10 billion of NIH funded-research (a quarter of its annual budget) is at risk of being eliminated because of the virus and its impacts on operations.[20]

As highlighted by the CGR's report, a reduction of this magnitude in research output could have severe implications for the Nation's R&D enterprise. It could prevent institutions from achieving research goals and may even result in the loss of entire research programs. It could significantly slow down discoveries and technology development, subsequently decreasing the quantity and quality of U.S. research. It could also result in the loss of a generation of trained scientists and engineers. University research typically involves postdoctoral researchers and graduate and undergraduate students. Although some research projects have been allowed to continue despite COVID–19, many universities are limiting the participation of post-doctoral researchers and students. Failing to complete a project on time or participate in the research may delay the completion of a degree or make it difficult to find employment.[21] The loss of early career professionals and students could have a severe impact on future workforce needs of the Federal, private, nonprofit, and academic R&D sectors.[22]

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[16] Prepared statement of Dr. David Stone, Vice President for Research, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology, of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Stone%20Testimony.pdf) (accessed Nov. 6, 2020); prepared statement of Dr. Joseph Walsh, Interim Vice President for Economic Development and Innovation, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology, of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Walsh%20Testimony.pdf) (accessed Nov. 6, 2020).

[17] Council on Governmental Relations, Research Impact Under COVID–19: Financial Crisis and the "Pandemic Normal," Aug. 2020 (https://www.cogr.edu/sites/default/files/Research_COVID_August2020_COGR_FINAL.pdf) (accessed Nov. 6, 2020).

[18] Ibid.

[19] Ibid.

[20] Jeannie Baumann, "Virus Will Cost NIH $10 Billion in Lost Research, Director Warns," *Bloomberg Law* (https://www.researchamerica.org/news-events/virus-will-cost-nih-10-billion-lost-research-director-warns) (accessed Nov. 6, 2020).

[21] Prepared statement of Dr. Joseph Walsh, Interim Vice President for Economic Development and Innovation, submitted to the Committee on Science, Space, and Technology, Subcommittee on Research and Technology, of the House of Representatives, for hearing on "Time Change: The Impact of the COVID–19 Crisis on University Research," 116th Cong., 2nd sess., Sep. 9, 2020 (https://science.house.gov/imo/media/doc/Walsh%20Testimony.pdf) (accessed Nov. 6, 2020).

[22] Council on Governmental Relations, Research Impact Under COVID–19: Financial Crisis and the "Pandemic Normal," Aug. 2020 (https://www.cogr.edu/sites/default/files/Research_COVID_August2020_COGR_FINAL.pdf) (accessed Nov. 6, 2020); Justin Chen, "COVID–19 has Shuttered Scientific Labs. It Could Put a Generation of Researchers at Risk," *STAT*, May 4, 2020 (https://www.statnews.com/2020/05/04/coronavirus-lab-shutdowns-impact-on-scientists-research-delays/) (accessed Nov. 6, 2020).

Federal Action Taken and Proposed

Since March, the Federal Government has taken legislative and administrative action to support the Federal R&D enterprise. On March 6, 2020, the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020[23] was enacted, appropriating $836 million in supplemental funding for NIH, with additional transferable amounts from other accounts. On March 9, 2020, the Office of Management and Budget (OMB) authorized Federal agencies to provide various short-term relief from administrative, financial management, and auditing requirements for grantees involved in research related to COVID–19.[24] Following a request from four research and university organizations,[25] OMB expanded the scope of these provisions to apply to Federal grantee recipients affected by COVID–19.[26] This has allowed Federal science agencies to provide existing awardees no-cost extensions of awards, extensions of financial and reporting deadlines, changes to cancellation fees and costs associated with pausing and restarting research, and continued payment of salaries and benefits out of grant funds.[27] These flexibilities have since expired, with the exception of a few provisions set to expire on December 31, 2020.[28] On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act[29] appropriated more than $1 billion in supplemental funding for R&D, $945 million of which went to NIH.

Given the severity of the impact of COVID–19 on the U.S. research enterprise, on April 7, 2020, a coalition of four major U.S. university associations sent a letter to Congress advocating for an additional $26 billion across major Federal science agencies for extramural research.[30] The coalition highlights that while COVID–19 related-research is "in overdrive, most other research has been slowed down or stopped due to pandemic-induced closures of campuses and laboratories."[31] The funding proposed by the coalition would be used to extend the duration, and if necessary, expand the purpose of existing grants.[32] Additionally, the funds would be used

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[23] Public Law 116–123.

[24] Office of Management and Budget, "Administrative Relief for Recipients and Applicants of Federal Financial Assistance Directly Impacted by the Novel Coronavirus (COVID–19)," Memorandum M–20–11, Mar. 9, 2020 (https://www.whitehouse.gov/wp-content/uploads/2020/03/M-20-11.pdf) (accessed Nov. 6, 2020).

[25] Letter from Association of American Universities, Council on Government Relations, Association of Public and Land-Grant Universities, and Association of American Medical Colleges, to OMB, Mar. 18, 2020 (https://www.cogr.edu/sites/default/files/Joint%20Association%20Letter%20to%20OMB%20On%20M-20-11%20Expansion.pdf) (accessed Nov. 6, 2020).

[26] Office of Management and Budget, *Administrative Relief for Recipients and Applicants of Federal Financial Assistance Directly Impacted by the Novel Coronavirus (COVID–19) Due to Loss of Operations,* Memorandum M–20–17, Mar. 19, 2020 (https://www.whitehouse.gov/wp-content/uploads/2020/03/M-20-17.pdf) (accessed Nov. 6, 2020).

[27] Ibid.

[28] Office of Management and Budget, *Extension of Administrative Relief for Recipients and applicants of Federal Financial Assistance Directly Impacted by the Novel Coronavirus (COVID–19) Due to Loss of Operations,* Memorandum M–20–26, Jun. 18, 2020 (https://www.whitehouse.gov/wp-content/uploads/2020/06/M-20-26.pdf) (accessed Nov. 6, 2020).

[29] Public Law 116–136.

[30] Letter from Association of American Universities, Association of Public and Land-Grant Universities, and Association of American Medical Colleges, American Council on Education, to Hon. Nancy Pelosi, Speaker of the U.S. House of Representatives; Hon. Kevin McCarthy, Minority Leader of the U.S. House of Representatives; Hon. Mitch McConnell, U.S. Senate Majority Leader; and Hon. Charles Schumer, U.S. Senate Minority Leader, Apr. 7, 2020 (https://www.aplu.org/members/councils/governmental-affairs/CGA-library/higher-ed-community-phase-iv-research-priorities/file) (accessed Nov. 6, 2020).

[31] Ibid.

[32] Ibid.

to offset costs associated with delays and increased costs of goods and services incurred by grant recipients as a result of the pandemic. The coalition petitions that without additional support to non-pandemic research, "the future health and strength of the U.S. research enterprise, are at risk."[33]

SUMMARY OF PROVISIONS

If enacted, S. 4286, the Research Investment to Spark the Economy Act, would do the following:

- Provide supplemental funding to extend the duration or expand the purposes of an award to a research institution, research laboratory, or individual that was disrupted because of the COVID–19 public health emergency and was awarded prior to the enactment of this bill.
- Provide flexibility on the use of funds for an award disrupted because of the COVID–19 public health emergency, by any prior or subsequent Act, including provision of supplemental funding to extend the duration of the award concerned or flexibility on the allowable expenses under such award.
- Permit issuance of additional awards to research institutions, research laboratories, or other individuals to conduct research on the effects of COVID–19 and future potential pandemics.

LEGISLATIVE HISTORY

S. 4286 was introduced on July 22, 2020, by Senator Markey (for himself and Senators Tillis, Peters, and Gardner) and was referred to the Committee on Commerce, Science, and Transportation of the Senate. Senators Warren and Collins are additional cosponsors. On September 16, 2020, the Committee met in open Executive Session and, by voice vote, ordered that S. 4286 be reported favorably with an amendment (in the nature of a substitute).

A related bill, H.R. 7308, the Research Investment to Spark the Economy Act or RISE Act, was introduced on June 24, 2020, by Representative DeGette (for herself and Representatives Upton, Johnson [D–TX–30], Lucas, Eshoo, and Gonzalez [R–OH–16]) and was referred to the Committees on Science, Space, and Technology, Agriculture, Armed Services, Education and Labor, Energy and Commerce, and Natural Resources in the House of Representatives. There are an additional 136 cosponsors. On July 14, 2020, H.R. 7308 was referred to the Subcommittee on Water, Oceans, and Wildlife of the Committee on Natural Resources of the House of Representatives.

ESTIMATED COSTS

In compliance with subsection (a)(3) of paragraph 11 of rule XXVI of the Standing Rules of the Senate, the Committee states that, in its opinion, it is necessary to dispense with the requirements of paragraphs (1) and (2) of that subsection in order to expedite the business of the Senate.

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[33] Ibid.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported:

Number of Persons Covered

S. 4286 would not impose any new significant regulatory requirements, and, therefore, would not subject any individuals or businesses to new significant regulations.

Economic Impact

S. 4286 is not expected to have any significant adverse impacts on the Nation's economy. It will likely have a positive impact by supplementing R&D activities that stimulate the economy.

Privacy

S. 4286 would not have any adverse impact on the privacy of individuals.

Paperwork

S. 4286 would not impose a substantial paperwork burden on individuals or businesses.

CONGRESSIONALLY DIRECTED SPENDING

In compliance with paragraph 4(b) of rule XLIV of the Standing Rules of the Senate, the Committee provides that no provisions contained in the bill, as reported, meet the definition of congressionally directed spending items under the rule.

SECTION-BY-SECTION ANALYSIS

Section. 1. Short title.

This section would provide that the bill may be cited as the "Research Investment to Spark the Economy Act of 2020" or the "RISE Act of 2020".

Section 2. Findings.

This section would provide congressional findings regarding the impact of COVID–19 on Federal research awardees and the need for further congressional action.

Section 3. Award and modification of grants, cooperative agreements and other financial assistance for institutions of higher education, research laboratories, and other research institutions to address matters relating to disruption caused by COVID–19.

This section would define the terms "award", "COVID–19 public health emergency", "research institution", and "research laboratory" referenced in this section. This section would designate agencies that may exercise authorities listed in this section for awards issued to research institutions, research laboratories, or other individuals disrupted by the COVID–19 public health emergency. These authorities include providing supplemental funding to extend the duration or expand the purpose of an award and providing various flexibilities on allowable expenses under such an award. Additionally, agency officers would be allowed to issue awards to

eligible entities to conduct research on the effects of COVID–19 and future potential pandemics. This section would mandate that each eligible Federal science agency that receives funds must develop procedures to award supplemental funds as expeditiously as possible. This section would provide authorizations of appropriations to Federal science agencies to carry out the purposes of this Act. This section would also provide rules on the availability of appropriated funds for administration of applicable awards and allow funds to be available for use though fiscal year 2021.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee states that the bill as reported would make no change to existing law.

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