U.S. HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON RESEARCH & TECHNOLOGY
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HEARING CHARTER

America's Seed Fund: A Review of SBIR and STTR

Wednesday, February 5, 2020
2:00 p.m. – 4:00 p.m.
2318 Rayburn House Office Building

PURPOSE

On Wednesday, February 5, 2020, the Subcommittee on Research and Technology of the Committee on Science, Space, and Technology will hold a hearing to review the role of the Small Business Innovation Research (SBIR) Program and Small Business Technology Transfer (STTR) Program in helping to move the results of Federally funded research into commercial development and generating new economic growth, as well as in assisting federal science agencies in meeting their respective missions. The Subcommittee will also consider recommendations for improvements to the SBIR and STTR Programs and receive testimony on *The Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2019.*

WITNESSES

- **Dr. Dawn Tilbury,** Assistant Director, Directorate of Engineering, National Science Foundation
- **Dr. Maryann Feldman,** S.K. Heninger Distinguished Professor of Public Policy, Department of Public Policy; Adjunct Professor of Finance, Kenan-Flagler Business School; Faculty Director, CREATE, Kenan Institute of Private Enterprise; The University of North Carolina at Chapel Hill
- **Mr. Nicholas Cucinelli,** Chief Executive Officer, Endectra
- **Dr. Johnny Park**, Chief Executive Officer, Wabash Heartland Innovation Network

OVERARCHING QUESTIONS

- What role does, or could, SBIR and STTR play in U.S. innovation policy? What is the value of the SBIR and STTR programs for start-ups and early-stage entrepreneurs?
- What do the data and assessments tell us about the SBIR and STTR programs' successes and/or challenges? Are there any policy recommendations for the current reauthorization process?
- What are additional and/or complementary ways to increase commercialization of federally funded university research and to achieve the goals of the SBIR Program?

SBIR and STTR

Congress established the Small Business Innovation Research Program (SBIR) in 1982 and the Small Business Technology Transfer (STTR) Program in 1992 [hereafter referred to as "SBIR" collectively unless otherwise noted] as a way to encourage and facilitate small business participation in the federal research mission and to support transfer of federally funded research into market-ready technologies. The laws governing these programs is found under Section 9 of the Small Business Act (15 U.S.C. 638). SBIR awards are made using a competitive and merit-based selection process. The key distinction between the programs is that STTR requires collaboration with universities or federally funded research and development centers.

The Small Business Administration (SBA) administers the SBIR program; however, the program is funded from set-asides in extramural research and development (R&D) accounts at each agency required to participate in the Program. Each agency with an annual extramural R&D budget over $100 million is required allocate 3.2% of its budget for SBIR grants and contracts[1] and each agency with an annual extramural R&D budget of $1 billion or more must allocate an additional 0.45% of its extramural budget to STTR.[2] The five agencies required to participate in STTR account for over 90% of the overall SBIR program's expenditures, which totaled approximately $2.7 billion for SBIR and $368 million for STTR in FY17, the most recent year for which data is available.

Agencies award SBIR and STTR grants and contracts in three designated phases. In Phase I, agencies may award funding up to $150,000 for six to 12 months. These funds are to be used for determining technical and scientific merit and feasibility of ideas. During Phase II, agencies may make awards up to $1,000,000 for up to two years, which are to be used for further development activities and for determining commercial potential. Phase III of the program is for commercialization and is funded by non-federal sources for most agencies. However, if the agency intends to purchase the SBIR-funded technology, an agency may use its non-SBIR federal funds to fund Phase III.

In recent history, the annual defense authorization laws have served as the vehicle for periodically reauthorizing or extending SBIR. NDAA 2012 [P.L. 112-81] reauthorized the SBIR and STTR programs and increased the allocations for each program. It increased the SBIR set-aside levels from 2.5% in FY 2011 to 3.2% in FY 2017 and increased the STTR set-aside levels from 0.35% in FY 2011 to 0.45% in FY 2017. In the 2017 NDAA (P.L. 114-328, sec. 1834), Congress passed a simple extension of the programs through the end of FY 2022, holding the program at the 2017 allocation levels, and without addressing policy issues.

[1] Eleven agencies are required to have SBIR programs, these include: Department of Agriculture; Department of Commerce – National Institute of Standards and Technology; Department of Commerce – National Oceanic and Atmospheric Administration; Department of Defense; Department of Energy; Department of Health and Human Services (the National Institutes of Health); National Aeronautics and Space Administration; and National Science Foundation.

[2] Five agencies are required to have STTR programs, these include: Department of Defense; Department of Energy; Department of Health and Human Services (National Institutes of Health); National Aeronautics and Space Administration; and National Science Foundation.

NDAA 2019 included a number of policy amendments to SBIR, including the extension of several pilot programs established in the 2011 reauthorization. In addition, NDAA 2020 included several amendments to the Department of Defense SBIR program as well as an amendment to include consultation with procurement personnel in the SBIR process at each of the Federal agencies participating in SBIR.

The Science Committee shares SBIR jurisdiction with the House Small Business Committee (SBC). The House passed a bipartisan SBIR reauthorization bill in 2018; however, it was not taken up by the Senate. Ranking Member Baird and Chairwoman Stevens, in addition to Rep. Burchett and Rep. Crow of the SBC, introduced H.R. 3774, "*The Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2019*" in July 2019. The bill is largely based on the 2018 House-passed bill minus provisions enacted into law under NDAA 2019. H.R. 3774, as introduced, does not reflect the amendments made in NDAA 2020. While a number of pilots and other policy matters were extended or established in NDAA 2019 and NDAA 2020, this hearing is intended to be an opportunity to receive recommendations for additional improvements Congress should consider for the SBIR program as it moves toward a more comprehensive 5-year reauthorization.

BILL SUMMARY

The following are the major provisions of H.R. 3774, as introduced:

- Sec. 1 – Short Title.
- Sec. 2 –Requires DOD to establish goals for the transition of Phase III technologies into subcontracting plans.
- Sec. 3 – Requires DOD to submit a report to Congress on the establishment of goals for the transition of Phase III technologies into subcontracting plans.
- Sec. 4 – Requires SBA to ensure that agencies give high priority to manufacturing companies.
- Sec. 5 – Requires SBA to ensure that agencies engaged in cybersecurity give high priority for SBIR awards to small businesses engaged in cybersecurity.
- Sec. 6 – Makes Phase III language compliant with competitive procedures.
- Sec. 7 – Requires SBIR and STTR agencies to coordinate with procurement and other acquisition personnel. [Similar language was included in NDAA 2020]
- Sec. 8 – Requires increased SBIR and STTR outreach to Minority-Serving Institutions.
- Sec. 9 – Requires SBA and each SBIR and STTR agency to meet annually to discuss methods to improve data collection, reporting, the application process, and participation in the SBIR and STTR programs.
- Sec. 10 – Gives all SBIR agencies permanent authority to establish a civilian commercialization readiness program using 10% of their SBIR and STTR funds for technology development, testing and evaluation, and commercialization assistance.

- Sec. 11 – Requires SBIR agencies to implement a Commercialization Assistance Pilot Program under which an eligible entity may receive a subsequent Phase II SBIR award; if an agency has a sufficiently similar program then they are not required to implement a commercialization assistance pilot program under this section.
- Sec. 12 – Expands the current pilot to allow NIH, NSF, NASA, and DOE to use $5 million of each agencies' STTR funds to establish a Phase 0 Proof of Concept Partnership Pilot Program. The existing authority expires at the end of FY 2022.
- Sec. 13 – Requires that SBA's annual SBIR and STTR report to Congress be submitted by December 31 of each year. Requires that each agency's annual SBIR/STTR report to SBA be submitted by March 30 of each year.
- Sec. 14 – Authorizes all SBIR agencies to make Direct to Phase II awards and extends the authority through FY 2024. The existing authority expires at the end of FY 2022.

SBIR Program Flexibility

Each Federal agency required to participate in SBIR carries out its own unique SBIR program that fits its need. Each agency determines the categories of projects to be supported by its SBIR program, the solicitation schedule, final decisions on proposals, and makes other decisions in the administration of the program. However, as administrator of the overall SBIR program, the SBA issues, and periodically updates, SBIR policy directives for the general conduct of the SBIR program.

Congress has authorized several exceptions and waivers to make the SBIR program more flexible to suit the needs of the participating Federal agencies. For example, agencies are authorized to make awards up to 50 percent greater than the award guidelines. Currently, an agency may award a Phase 1 for up to $256,000 and a Phase II award for up to $1.7 million without seeking a waiver from the SBA.

In addition, small businesses that have received a Phase I award from one agency may receive a subsequent Phase II award from another Federal agency. NIH, DOD, and the Department of Education may award Phase II awards to small businesses that have not been provided a Phase I award if the agency determines that the small business meets the merit and feasibility qualifications required for Phase I. This is referred to as a "Direct to Phase II award." Additional agencies would like the flexibility that this authority provides. Finally, agencies may award one additional Phase II award to a small business to fund continued work on a project for which that small business has received a Phase II SBIR or STTR award. This is referred to as a "sequential Phase II award." Congress mandates agencies verify there is no duplication of funding for these projects under another Federal agency's SBIR or STTR program.

ISSUES

Early-stage Funding

When a researcher has a good idea, it takes significant effort to move that idea to a prototype and assess the potential market for the technology. Anecdotally, many innovators prematurely form a

company in order to get an SBIR grant to help with their proof of concept research and customer discovery, much of which could or should be carried out prior to company formation. The 2011 SBIR reauthorization established a Phase 0 Proof of Concept Partnership pilot program. It allowed NIH to use $5 million of its STTR funds to make awards to universities and research institutions to make grants to individual researchers for technical validations, market research, clarifying intellectual property rights, and investigating commercial or business opportunities. NIH's National Heart, Blood, and Lung Institute implemented the Research Evaluation and Commercialization Hubs (REACH) to develop best practices to translate university innovations into real-world drugs, devices, and diagnostics. NIH submitted the Congressionally mandated evaluation of the pilot to Congress in June 2019. The agency reported that it has funded three sites and 109 technology development projects, and that over 1,000 innovators received commercialization and entrepreneurship training since it stood up the program in 2015. The agency reported that as of November 2018, 22 startup companies had formed to commercialize REACH-funded technologies and these companies had submitted 12 SBIR/STTR applications, five of which had been funded. Additionally, eight technologies had been licensed and two had been optioned to license.

Currently, there are limited resources for the early, pre-SBIR stages of the innovation pipeline. In 2012, NSF launched the Innovation Corps, or I-Corps program, which is supported separately from SBIR. The I-Corps program provides funding and mentorship to help assess the viability for possible commercialization of nascent technological concepts developed through research funded by NSF. This January, NSF announced a new, more integrated structure for the program, now referred to as the "I-Corps Hubs Program," and will begin to welcome researchers funded by other Federal agencies. The data show that roughly 50-60% of I-Corps teams go on to form companies, and 2/3 of those teams choose to apply for SBIR funding.[3,4] I-Corps teams who do apply are four times[5] more likely to receive an SBIR award than the overall population of applicants for NSF SBIR funding (40% compared to 11%).[6] Other Federal agencies, including NIH and DOE, have started their own I-Corps programs. I-Corps may be considered another approach to "Phase 0" for SBIR and additional resources in support of the I-Corps program may strengthen the overall SBIR outcomes. H.R. 3774, as introduced, is intended to expand the Phase 0 pilot to NSF, NASA, and DOE. If enacted, this would support Phase 0 programs at all the civilian agencies participating in the STTR program.

Commercialization

One of the missions of SBIR is private-sector commercialization of innovation. To help improve SBIR's effectiveness in the later stages of the innovation lifecycle, Congress has authorized agencies to support commercialization assistance programs for SBIR awardees at defense and civilian agencies. Agencies may enter into agreements with vendors to contract with SBIR

[3] https://viterbiinnovation.usc.edu/wp-content/uploads/2020/01/SBIR-VC-USOs-SSRN.pdf, presented at peer-reviewed conferences West Coast Research Symposium, 2018; and Strategy Science Conference, 2019.
[4] https://www.nsf.gov/news/special_reports/i-corps/pdf/I-CorpsReport--6_4_19FINAL_508.pdf.
[5] https://viterbiinnovation.usc.edu/wp-content/uploads/2020/01/SBIR-VC-USOs-SSRN.pdf, presented at peer-reviewed conferences West Coast Research Symposium, 2018; and Strategy Science Conference, 2019.
[6] https://www.sbir.gov/awards/annual-reports.

awardees to provide technical and business assistance. While many small businesses do use SBIR awards as a springboard to private sector funding and commercialization of their business, there are some companies that receive SBIR awards year after year and never fully commercialize. To address this issue, the 2011 reauthorization required agencies to establish a way to measure the rate of commercialization for a small business, establish a minimum performance standard, and track commercialization success of the small business and its progress to Phase II and Phase III. If a small business does not meet these performance goals, they are ineligible to receive a Phase I or Phase II award for one year.

Administrative Fee

Congress authorized an administrative pilot program ("administrative fee") that allowed agencies to use 3% of their SBIR funds for new activities that go toward achieving six program goals including: outreach activities; commercialization; streamlining and simplification; prevention and detection of fraud, waste, and abuse; reporting; and administration and implementation of the reauthorization. A May 2016 report from the U.S. Government Accountability Office[7] found that in FY 2014, 7 of the 11 agencies with SBIR programs participated in the pilot and reported spending $19.1 million to address the pilot program's goals.

Evaluation

Congress has required quadrennial reviews of each agency's SBIR program by the National Academies of Science, Engineering, and Medicine. The last round of reviews was carried out in 2015-2016, and the new round is underway. Those reviews found that agencies were meeting every goal of the SBIR program except for fostering participation by socially and economically disadvantaged persons, which includes women and minority-owned firms. The National Academies' 2015 assessment of SBIR/STTR at NIH[8] found that women and minority participation is "low and declining" at NIH. This is a similar area of concern across all SBIR participating agencies. In its previous round of studies, NAS recommended that SBIR participating agencies develop new benchmarks and metrics to improve participation by underserved populations and to better evaluate agency outreach efforts.

The SBIR programs at two DOE offices, the Office of Energy Efficiency and Renewable Energy and the Office of Fossil Energy, were evaluated in a May 2019 report. The report showed that a Phase I award has positive effects on innovation, firm growth, and patenting for young firms but those effects decline for firms with multiple previous SBIR awards.[9] In addition, the report found that a Phase II award does not have any significant effects on a firm's growth, and even less so for firms with multiple SBIR awards.[10]

---

[7] GAO May 2016 Report Small Business Research Programs: Agencies Have Improved Compliance with Spending and Reporting Requirements, but Challenges Remain."
[8] The National Academies of Science, "SBIR/STTR at the National Institutes of Health," 2015.
[9] Howell, Sabrina T., "Analysis of the U.S. Department of Energy's Energy Efficiency & Renewable Energy and Fossil Energy SBIR Programs," February 2019.
https://www.energy.gov/sites/prod/files/2019/03/f60/sbir-eere-fe-analysis-howell-report-2019.pdf
[10] Id.