United States Government Accountability Office

Report to Congressional Committees

November 2014

SMALL BUSINESS INNOVATION RESEARCH

Change in Program Eligibility Has Had Little Impact

GAO-15-68

GAO Highlights

Highlights of GAO-15-68, a report to congressional committees

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Why GAO Did This Study

The SBIR program provides grants and contracts to small businesses to develop and commercialize innovative technologies. The 2011 SBIR reauthorization included a provision that gave agencies the option to allow majority-owned portfolio companies to participate in SBIR. SBA issued a rule to implement the statutory provision, which became effective in January 2013. The reauthorization act requires agencies to submit a written determination to SBA and Congress, explaining how such awards will, among other things, significantly contribute to the agency's mission, before making SBIR awards to majority-owned portfolio companies.

The reauthorization mandated GAO to review the impact of this provision every 3 years. This is the first report under the mandate, and it examines (1) the impact of allowing majority-owned portfolio companies to participate in agency SBIR programs and (2) the extent to which agencies have elected to expand their SBIR programs to include majority-owned portfolio companies. GAO reviewed agency rules, policies, and other documents; analyzed SBIR data; and interviewed program officials from SBA and the 11 participating agencies, industry associations, and majority-owned portfolio companies.

What GAO Recommends

GAO recommends that SBA discuss the written determination requirement with participating agencies and, if needed, provide additional guidance. SBA generally agrees with the recommendation and plans to discuss the written determination requirement at a future program managers meeting.

View GAO-15-68. For more information, contact Cindy Brown Barnes at (202) 512-8678 or brownbarnesc@gao.gov.

What GAO Found

Two of the 11 agencies participating in the Small Business Administration's (SBA) Small Business Innovation Research (SBIR) program—the Department of Health and Human Services (HHS) and the Department of Energy (DOE)—opted to open part of their SBIR programs to small businesses that are majority-owned by multiple venture capital or similar firms (majority-owned portfolio companies), allowing such companies to apply for and receive SBIR awards. Specifically, HHS's National Institutes of Health (NIH) and the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) opted to allow such companies to participate. For fiscal years 2013 and 2014, NIH and ARPA-E collectively received 20 applications from majority-owned portfolio companies and made 12 SBIR awards to them, totaling about $7.9 million. SBIR applications received and awards made to these companies comprise less than 1 percent of NIH and ARPA-E's SBIR applications and awards. NIH and ARPA-E officials said the change to allow majority-owned portfolio companies to apply for SBIR awards helps ensure that their SBIR programs receive the best research proposals.

For various reasons, the remaining nine agencies participating in SBIR have not submitted a written determination to allow them to make SBIR awards to majority-owned portfolio companies. According to officials from these agencies, they did not conduct any formal analysis but considered various factors, such as whether the change would significantly increase the number of applications, what administrative resources would be required to implement the change, and whether they had the evidence needed to prepare a written determination. All but one of the agencies told GAO that they may reevaluate their decision in the future, but did not have any specific plans for doing so. Officials from several agencies said that they wanted to see how the change in eligibility affected NIH and ARPA-E before implementing the change at their agencies.

GAO also found that some agencies viewed the written determination as a potentially stringent requirement. For their written determinations, NIH and ARPA-E did not conduct any independent research on majority-owned portfolio companies (nor were they specifically required to do so), but NIH cited related research. In contrast, six agencies viewed the written determination as potentially requiring independent analysis. Five agencies told GAO that they did not have the evidence or research needed to support a written determination, and another agency said it might consider opting in if it were easier to do so. According to SBA, the written determination is a notification letter that SBA reviews but does not approve or deny. SBA officials said they meet routinely with SBIR program managers, and this issue has not been raised. SBA updated its SBIR Policy Directive to include the written determination requirement but essentially used the same language as the reauthorization act without providing any specific guidance. In SBA's rule implementing the reauthorization act, SBA stated the rule's potential benefit is to provide more businesses with access to the SBIR program, which could increase competition and the quality of proposals and spur innovation. SBA is not responsible for encouraging or discouraging agencies to expand eligibility to include such companies, but SBA also has not discussed the issue with them. SBA could be missing an opportunity to help agencies better understand the evidence required for the written determination, which could inform the agencies' decisions whether to expand their program.

Contents

Abbreviations

ARPA-E	Advanced Research Projects Agency-Energy
CDC	Centers for Disease Control and Prevention
DOE	Department of Energy
HHS	Department of Health and Human Services
NDAA	National Defense Authorization Act for Fiscal Year 2012
NIH	National Institutes of Health
R&D	research or research and development
SBA	Small Business Administration
SBIR	Small Business Innovation Research

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

November 20, 2014

The Honorable Maria Cantwell
Chairwoman
The Honorable James E. Risch
Ranking Member
Committee on Small Business and Entrepreneurship
United States Senate

The Honorable Sam Graves
Chairman
The Honorable Nydia M. Velázquez
Ranking Member
Committee on Small Business
House of Representatives

Starting in 2013, implementation of the National Defense Authorization Act for Fiscal Year 2012 (NDAA) enabled agencies to allow small businesses that are majority owned by multiple venture capital operating companies, hedge funds, or private equity firms (majority-owned portfolio companies) to participate in the Small Business Innovation Research (SBIR) program. In 1982, Congress established the SBIR program to, among other things, stimulate technological innovation related to federal agency goals and missions, use small businesses to meet federal research or research and development (R&D) needs, and increase private sector commercialization of innovations derived from federal R&D.[1] In fiscal year 2013, federal agencies made more than 4,000 awards totaling more than $2.1 billion through the SBIR program. Over the program's first two decades, some majority-owned portfolio companies participated in SBIR, without any apparent adverse consequence for the program's operation and achievements, according to a study by the National Academy of Sciences.[2] However, in 2003, a Small Business Administration (SBA) administrative law judge issued a decision

[1]Small Business Innovation Development Act of 1982, Pub. L. No. 97-219, 96 Stat. 217 (1982).

[2]See Committee for Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program, National Academy of Sciences, *Venture Funding and the NIH SBIR Program,* Charles W. Wessner, ed. (The National Academies Press, Washington, D.C.: 2009).

holding that such companies were ineligible to receive SBIR awards.[3] The decision raised concerns that some portfolio companies were being unfairly excluded from SBIR and that important research was not being funded. Others supported the decision, contending that small businesses without venture capital funding would not be able to compete against small businesses with such funding.

The NDAA reauthorized the SBIR program through fiscal year 2017 and included provisions that allow SBIR participating agencies to permit majority-owned portfolio companies to participate in their SBIR programs.[4] In December 2012, SBA issued a final rule to implement the NDAA provisions and revise SBIR's eligibility criteria to include majority-owned portfolio companies, which became effective in January 2013.[5] The act allows but does not require agencies to permit majority-owned portfolio companies to participate in their SBIR programs. In order to allow such companies to participate, SBIR participating agencies must submit a written determination to SBA and Congress, explaining how making SBIR awards to such companies will, among other things, induce additional venture capital funding of small business innovations and

[3]To qualify for SBIR awards, small businesses must meet certain SBIR ownership and other eligibility criteria, such as being more than 50 percent owned by individuals who are U.S. citizens or permanent resident aliens. 13 C.F.R. § 121.702(a). In 2003, an SBA administrative law judge issued a decision stating that venture capital firms could not be considered "individuals" for the purpose of satisfying the ownership criteria for the program. *Size Appeal of Cognetix, Inc.*, SBA No. SIZ-4560 (2003).

[4]Pub. L. No. 112-81, Tit. LI, 125 Stat. 1298, 1823 (2011). The NDAA also reauthorized the Small Business Technology Transfer program, which was initiated in 1992 for the purpose of stimulating a partnership of ideas and technologies between innovative small businesses and research institutions through federally funded R&D. Research institutions include nonprofit colleges or universities and federally funded research and development centers. The Small Business Technology Transfer program is outside the scope of our review because SBA's final rule does not permit majority-owned portfolio companies to participate in that program.

[5]77 Fed. Reg. 76,215 (Dec. 27, 2012).

substantially contribute to the agency's mission.[6] In addition, the NDAA mandates that GAO conduct a study of the impact of requirements related to participation in the SBIR program by majority-owned portfolio companies and issue a report every 3 years, with the first report due by December 31, 2014.[7] This report examines (1) the impact of allowing majority-owned portfolio companies to participate in agency SBIR programs and (2) the extent to which agencies have elected to expand their SBIR programs to include majority-owned portfolio companies. Our analysis of the impact focuses on determining which agencies opened their SBIR programs to majority-owned portfolio companies and how many of these companies applied for and received SBIR awards.

To address our objectives, we obtained and reviewed the written determinations submitted by the agencies to SBA and Congress—that is, those submitted by the Department of Energy (DOE) and National Institutes of Health (NIH). We also reviewed the NDAA and related congressional record and hearings on SBIR; SBA's proposed and final rules implementing the NDAA by revising the eligibility criteria for SBIR, including comment letters submitted in response to the proposed rule; and SBA's SBIR Policy Directive, annual reports, and other related material. We also reviewed and analyzed SBIR data on solicitations, applications, and awards from DOE and NIH during fiscal years 2013 and 2014, to identify awards made to majority-owned portfolio companies; data from the other nine SBIR participating agencies on SBIR awards they made during fiscal year 2013; and data on majority-owned portfolio

[6]Specifically, an agency must submit a written determination to the Senate Committee on Small Business and Entrepreneurship, the House Committee on Small Business, and the House Committee on Science, Space, and Technology at least 30 calendar days before it begins making awards to majority-owned portfolio companies. The written determination must include four elements that explain how allowing majority-owned portfolio companies will: (1) induce additional venture capital, hedge fund, or private equity firm funding of small business innovations; (2) substantially contribute to the mission of the federal agency; (3) demonstrate a need for public research; and (4) otherwise fulfill the capital needs of small business concerns for additional financing for SBIR projects. 15 U.S.C. § 638(dd)(1)-(2).

[7]Pub. L. No. 112-81, § 5142 (codified at 15 U.S.C. § 638a). The NDAA also includes provisions that require the participating agencies, in consultation with SBA, to commission a study by the National Academy of Sciences to review the SBIR program, including the value and quality of the research, economic and non-economic benefits, and jobs created. Additionally, the National Research Council has completed studies on the SBIR program under previous mandates, including a study on the impact of venture funding at the National Institutes of Health.

companies and other small businesses registered with SBA. To assess the reliability of these data, we interviewed agency officials about the source of the data and data quality control procedures for the data and reviewed relevant documentation. We determined the data were sufficiently reliable for the purposes of this report. In addition, we reviewed studies on SBIR by the National Academy of Sciences, Congressional Research Service, and GAO. We interviewed officials from SBA and the 11 SBIR participating agencies about SBIR, including SBA's rule implementing the NDAA's amendments to SBIR's eligibility criteria and their decisions on whether to submit a written determination. We also interviewed officials from three industry associations representing small businesses or venture capital firms, a researcher from the National Academy of Sciences, a venture capital firm, and a consultant about SBIR, including the potential impact of expanding SBIR to include majority-owned portfolio companies and the potential interest of such companies in SBIR. We selected these organizations and individuals to interview based on our review of the congressional record and SBIR hearings and our discussions with SBA and participating agencies. In addition, we interviewed all four majority-owned portfolio companies that received SBIR awards from one of the two participating agencies that submitted a written determination, as of May 2014, when we made our initial data request. Finally, we interviewed four majority-owned portfolio companies that registered with SBA but had not yet applied for an SBIR award to obtain information on their experiences with SBIR. We selected the four companies based on their percent ownership by venture capital and area of primary research.

We conducted this performance audit from February 2014 to November 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Federal agencies with a budget in excess of $100 million for extramural R&D are required to establish and operate an SBIR program.[8] In fiscal year 2013, agencies participating in the SBIR program were required to spend at least 2.7 percent of their extramural R&D budgets on SBIR awards. Currently, 11 agencies participate in the SBIR program: the Departments of Agriculture, Commerce, Defense, Education, Energy (DOE), Health and Human Services (HHS), Homeland Security, and Transportation, and the Environmental Protection Agency, National Aeronautics and Space Administration, and National Science Foundation. Although each agency manages its own program, SBA plays a central administrative and oversight role.

The SBIR program includes the following three phases:

- In phase I, agencies make awards to small businesses to determine the scientific and technical merit and feasibility of ideas that appear to have commercial potential. Phase I awards normally do not exceed $150,000. For SBIR, work in phase I generally lasts 6 to 9 months.
- In phase II, small businesses with phase I projects that demonstrate scientific and technical merit and feasibility, in addition to commercial potential, may compete for awards of up to $1 million to continue the R&D for an additional period, normally not to exceed 2 years.[9]
- Phase III is for small businesses to pursue commercialization of technology developed in prior phases. Phase III work derives from, extends, or completes an effort made under prior phases, but it is funded by sources other than the SBIR program. In this phase, small businesses are expected to raise additional funds from private investors, the capital markets, or from non-SBIR funding sources within the government. While SBIR funding cannot be used for phase

[8]Agencies' R&D programs generally include funding for two types of R&D: intramural and extramural. Intramural R&D is conducted by employees of a federal agency in or through government-owned, government-operated facilities. Extramural R&D generally is conducted by nonfederal employees outside of federal facilities. Agencies are required to calculate their extramural R&D budget by subtracting amounts obligated for intramural R&D from total obligations for R&D.

[9]Agencies may award a second, sequential, phase II award to continue a phase II project.

III, agencies can participate in phase III by, for example, purchasing the technology developed in prior phases.[10]

SBA's Office of Investment and Innovation is responsible for overseeing and coordinating the participating agencies' efforts for the SBIR program by setting overarching policy and issuing policy directives, collecting program data, reviewing agency progress, and reporting annually to Congress, among other responsibilities. As part of its oversight and coordination role, SBA issued an updated SBIR Policy Directive in January 2014.[11] The directive explains and outlines requirements for agencies' implementation of the SBIR program. The policy directive includes information on program eligibility, proposal requirements, terms of agreement for SBIR awards, and responsibilities of SBA and participating agencies for the program.

Each participating agency must manage its SBIR program in accordance with program laws, regulations, and the policy directive. Each participating agency has considerable flexibility to design and manage the specifics of the program, such as determining research topics, selecting award recipients, and administering funding agreements. All of the agencies follow the same general process to obtain proposals from and make awards to small businesses for the SBIR program. At least annually, each participating agency issues a solicitation requesting proposals for projects in topic areas determined by the agency. Each agency uses its own process to review proposals and determine which proposals should receive awards. Also, each agency determines whether the funding for awards will be provided as grants or contracts.

The NDAA amended the SBIR program to permit agencies to allow participation by majority-owned portfolio companies, and the act imposes certain requirements on such companies and participating agencies. As discussed, before awarding SBIR funds to majority-owned portfolio companies, agencies must submit to SBA and Congress a written determination. The NDAA also imposes statutory caps on the percentage

[10]For examples of how one agency has used phase III awards, see GAO, *Small Business Innovation Research: DOD's Program Supports Weapon Systems, but Lacks Comprehensive Data on Technology Transition Outcomes,* GAO-14-96 (Washington, D.C.: Dec. 20, 2013).

[11]SBA, Office of Investment and Innovation, Small Business Innovation Research (SBIR) Program Policy Directive, www.sbir.gov (Washington, D.C.: Feb. 24, 2014).

of participating agencies' SBIR funds that may be awarded to majority-owned portfolio companies—25 percent for NIH, DOE, and the National Science Foundation, and 15 percent for the other participating agencies. If an agency awards more than the percentage of the funds set by the statutory cap, the agency must transfer any amount in excess of the cap from its non-SBIR R&D funds to the agency's SBIR funds. Additionally, agencies may not use investment of venture capital or investment from hedge funds or private equity firms as a criterion for the award of contracts under the SBIR program. The NDAA also requires all majority-owned portfolio companies to register as such with SBA and indicate their majority-owned portfolio company status in any SBIR application. Finally, the NDAA required SBA to update the SBIR Policy Directive to conform to NDAA amendments, such as majority-owned portfolio company participation in the program.

Change in SBIR Program Eligibility Has Had Little Impact

In 2013, HHS and DOE each provided a written determination to SBA and Congress prior to making SBIR awards to majority-owned portfolio companies.[12] More specifically, HHS's written determination covered one of its four SBIR subunits, NIH, which according to agency officials accounted for about 98 percent of the HHS SBIR funds in fiscal year 2013.[13] DOE's written determination covered one of its two subunits that participate in SBIR, the Advanced Research Projects Agency-Energy (ARPA-E), which according to agency officials accounted for about 4 percent of the DOE SBIR awards in fiscal year 2013.[14] NIH and ARPA-E officials told us that by opening their SBIR programs to majority-owned

[12]HHS submitted its determination letter on March 7, 2013, and DOE submitted its letter on August 29, 2013.

[13]HHS has four subunits that participate in SBIR: (1) the Administration for Children and Families; (2) Centers for Disease Control and Prevention (CDC); (3) Food and Drug Administration; and (4) NIH. NIH's mission is to improve the health of humans. NIH is the largest source of funding for medical research in the world, and is made up of 27 institutes and centers that each has a specific research agenda. More than 80 percent of NIH's budget goes to more than 300,000 research personnel at over 2,500 universities and research institutions. CDC submitted its written determination letter on July 30, 2014, and expects to begin making awards during fiscal year 2015. Thus, CDC is not part of this review.

[14]ARPA-E's mission is to reduce U.S. dependence on energy imports, reduce U.S. energy-related emissions, improve energy efficiency across all sectors of the U.S. economy, and ensure that the United States maintains a technological lead in the development and deployment of advanced energy technologies.

portfolio companies, they would help ensure that they received the highest quality applications with the best scientific research, regardless of whether a small business has venture capital support. In addition, NIH officials said that allowing majority-owned portfolio companies to participate in SBIR would increase the flexibility for SBIR companies to seek additional investment sources that would help support SBIR's goal of commercialization. As part of its written determination, NIH cited a 2009 National Academy of Sciences study, whose findings suggested that the most commercially promising companies were those that were repeatedly selected by both NIH for their promising technologies and by venture capital investors for their commercial potential.[15]

A few majority-owned portfolio companies have participated in SBIR since SBA's final rule implementing the NDAA's changes to the SBIR eligibility requirements took effect in January 2013. NIH and ARPA-E opened their solicitations to majority-owned portfolio companies in April 2013 and June 2013, respectively.[16] From October 2012 (start of fiscal year 2013) through September 2014 (end of fiscal year 2014), these subunits issued 68 SBIR solicitations, of which 56 were open to majority-owned portfolio companies.[17] More specifically, ARPA-E opened one solicitation to majority-owned portfolio companies that covered both fiscal years 2013 and 2014, and NIH opened 55 solicitations to majority-owned portfolio companies during fiscal years 2013 and 2014.

In response to their SBIR solicitations open to majority-owned portfolio companies, ARPA-E and NIH received a small number of applications from such companies and made several awards to them. As shown in figure 1, majority-owned portfolio company applications received and

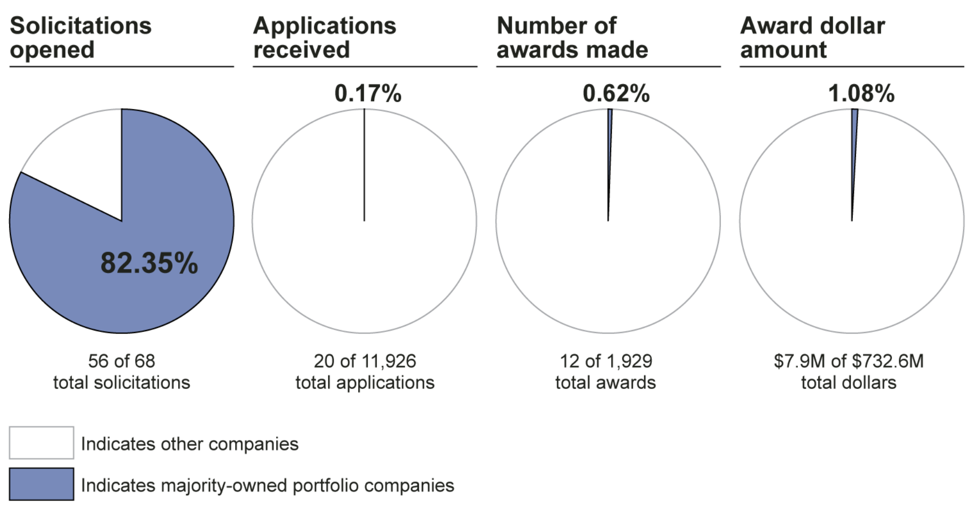
[15]Committee for Capitalizing on Science, Technology, and Innovation: *Venture Funding and the NIH SBIR Program,* 2009.

[16]NIH and ARPA-E, along with SBA, have used various means to inform majority-owned portfolio companies about the eligibility changes in their SBIR programs. On its SBIR website, SBA identifies the agencies that have opted to allow majority-owned portfolio companies to participate in their SBIR programs. According to NIH and ARPA-E officials, their solicitations now specifically state that majority-owned portfolio companies may participate. Further, NIH officials told us that they e-mailed approximately 15,000 subscribers, announcing the change in their agency's eligibility requirements.

[17]NIH and ARPA-E provided us with data for fiscal year 2014 before subjecting the data to their review process in preparation of their annual reports, which are typically due to SBA by March 15, 2015. As a result, our data may differ slightly from the data in their annual reports.

awards made comprise less than 1 percent of NIH's and ARPA-E's SBIR applications and awards. ARPA-E and NIH collectively received a total of 20 applications from majority-owned portfolio companies in fiscal years 2013 and 2014, compared to 11,906 applications from applicants that were not majority-owned portfolio companies. In addition, these two subunits made 12 SBIR awards to majority-owned portfolio companies. Specifically, ARPA-E made 2 SBIR awards to two majority-owned portfolio companies, which included one phase I award to one company and another award that included multiple phases to another company.[18] In addition, NIH made awards to 10 majority-owned portfolio companies that consisted of 7 phase I awards, and 3 phase II awards.

Figure 1: Summary of Majority-Owned Portfolio Company and Other Company SBIR Participation in ARPA-E and NIH in Fiscal Years 2013 and 2014



Source: GAO analysis of National Institutes of Health and Advanced Research Projects Agency-Energy data. | GAO-15-68

Note: Solicitations opened to majority-owned portfolio companies also were open to other eligible companies, while some solicitations opened to other eligible companies were not open to majority-owned portfolio companies.

[18] ARPA-E can make two types of combined awards: (1) combined phase I/phase II awards may be funded up to $1,725,000 with a period of performance up to 36 months and (2) combined phase I/phase II/phase II sequential awards may be funded up to $3,225,000 and may have a period of performance up to 48 months.

ARPA-E and NIH officials told us that it was too early for them to evaluate the impact of including majority-owned portfolio companies in their SBIR programs—such as how the composition of applicants and awardees might change—but said that this change has not created any administrative problems or burdens. The officials from both subunits told us that they did not encounter any challenges completing their written determination, updating their data systems, and monitoring their compliance with the statutory cap. ARPA-E is the only DOE subunit using the majority-owned portfolio company funding option, and so under the statute, it could potentially award up to 25 percent of DOE's total SBIR funds to such companies. DOE and ARPA-E officials told us they administer the cap at the subunit level—meaning that ARPA-E may award up to 25 percent of its SBIR funds to majority-owned portfolio companies. According to ARPA-E officials, for fiscal year 2013, ARPA-E made approximately $7 million in SBIR awards, of which about $1.7 million (or nearly 25 percent of its SBIR awards) was awarded to a majority-owned portfolio company. For fiscal year 2014, ARPA-E officials told us that the subunit was just under its fiscal year 2014 internal cap of 25 percent of its SBIR funds. NIH consists of 27 institutes and centers, and 24 institutes and centers participate in the SBIR program. NIH officials told us that they are applying the 25 percent statutory cap to each institute and center. Officials told us that NIH as a whole was not close to its 25 percent statutory cap for fiscal year 2014, having awarded about $4.5 million to majority-owned portfolio companies, which was about 0.68 percent of the agency's $663 million SBIR award obligations for fiscal year 2014.

Representatives from four majority-owned portfolio companies that received NIH or ARPA-E SBIR awards told us that their SBIR awards have allowed them to conduct new research that would otherwise not have been undertaken. For example, one representative said that venture capital firms often view R&D for new projects that they have not funded as a distraction from a firm's focus on commercializing a product and his company would have faced difficulties conducting its research without SBIR funding. Additionally, representatives from these four companies we interviewed told us that receiving an SBIR award can be viewed as validating the merit of their research, which can attract additional venture capital funds and improve their ability to commercialize their SBIR research. The representatives said they did not encounter any significant problems applying for SBIR awards or receiving SBIR funds.[19]

Most Participating Agencies Have Not Exercised Their Authority to Open Their SBIR Programs to Majority-Owned Portfolio Companies

Nine agencies have chosen not to open their SBIR programs to majority-owned portfolio companies, and therefore have not submitted a written determination to do so. Specifically, as of September 2014, the Departments of Agriculture, Commerce, Defense, Education, Homeland Security, and Transportation; Environmental Protection Agency; National Aeronautics and Space Administration; and National Science Foundation had not taken such action. The awards from these nine agencies, along with those from the programs within HHS and DOE that chose not to allow portfolio company participation, accounted for about 71 percent of the nearly $2.1 billion SBIR awards in fiscal year 2013.

Agencies Cite Various Reasons for Electing Not to Participate

Officials from the nine agencies generally told us that the decision not to open their programs to portfolio companies was made at the program level for each agency. They said the decision was based largely on internal discussions among SBIR staff and, in some cases, staff from other departments, and did not involve any formal analyses. The explanations that agency officials told us during our interviews for not submitting a written determination were as follows.

- *Department of Agriculture:* An official said that the Department viewed other administrative changes mandated under the NDAA as a higher priority, given the low level of interest from majority-owned portfolio

[19]These comments were consistent with findings from our prior work in which we found that venture capital firms are not typically interested in funding research covered by the SBIR program because such investments are high risk and typically have slow returns. We also reported that receiving an SBIR award served as a “stamp of approval” to venture capital firms, which means that venture capital firms may be more willing to fund projects. Our 2012 report summarized three reasons that explain why venture capital is not interested in this type of research: (1) Private investors consider these projects too high risk for investment, even for concepts with promising technological potential; (2) venture capital firms seek more rapid returns on investment and closely analyze a project’s potential return on investment over time, a factor that influences their decisions to invest in projects that are in later stages of development and closer to commercialization; (3) venture capital firms may not be comfortable investing in new energy technologies, noting the historical lack of successful venture capital investments in these types of projects. See GAO, *Department of Energy: Advanced Research Projects Agency-Energy Could Benefit from Information on Applicants’ Prior Funding*, GAO-12-112 (Washington, D.C.: Jan.13, 2012).

companies in their SBIR program.[20] They also said that the agency's SBIR awards are smaller than other agencies' awards, such as the Department of Defense and NIH, and majority-owned portfolio companies are most interested in the agencies offering the largest awards.

- *Department of Commerce:* Officials said that they viewed other administrative changes—such as changes to its proposal evaluation process—as a higher priority than the majority-owned portfolio company funding option. Also, the officials stated that they were concerned that adopting the funding option could lead to a significant increase in the number of proposals, and if that happened, there would be a corresponding decrease in the percentage of proposals receiving SBIR awards, given the small size of the agency's SBIR program compared to other federal agencies' programs. Officials said the agency will be in a better position to understand the possible results of implementing the funding option and can better prepare the agency's SBIR program once they see how the change impacts other agencies.
- *Department of Defense:* Officials said that the agency does not have the evidence to support that allowing majority-owned portfolio companies in SBIR would achieve the outcomes required to be specified in the written determination, such as substantially contributing to the agency's mission. Officials also said they do not believe that there is much interest from venture capitalists in investing in firms that would be eligible to receive SBIR phase I and phase II awards.
- *Department of Education:* Officials said that the agency does not have an official reason why it did not elect to exercise the majority-owned portfolio company funding option. They told us that majority-owned portfolio companies have not approached the agency about its SBIR

[20]In addition to changing SBIR's eligibility requirements, the NDAA made several key changes to the SBIR award process, SBIR program administration, and fraud, waste, and abuse prevention procedures. For the award process, the act requires agencies to make SBIR award decisions within a certain amount of time after the close of the solicitation. For program administration, the act's new requirements include creating and setting forth the policies for the new pilot program that permits agencies to use SBIR money for administration of the SBIR program and setting forth the new reporting and data collection requirements. Finally, the act included amendments relating to fraud, waste, and abuse, such as requiring small businesses to certify they are meeting the program's requirements during the life cycle of the funding agreement.

program for many years; thus, they did not see a reason to use the funding option.

- *Department of Homeland Security:* Officials said that they viewed other administrative changes mandated under the NDAA as a higher priority and that they had not yet conducted the research to provide evidence that majority-owned portfolio companies would achieve the outcomes required to be outlined in the written determination requirement. The officials also said that the agency's SBIR topics are narrowly defined to respond to the technology gaps in the agency's operating components. As a result, they said there is a lack of scalability for the general market; therefore, their SBIR program does not generally draw attention and interest from the venture capital community. The officials said, however, that they are working to gain greater partnership interest with industry to make these technologies more desirable in commercial markets, which may gain interest from the venture capital community.
- *Department of Transportation:* Officials said that they were concerned that opting in could increase the number of SBIR applications, which would impact the agency's resources and ability to meet the SBIR award timelines. Officials need additional time to consider the potential impact of opening its SBIR program up to majority-owned portfolio companies and how the agency can best manage that impact. The officials also told us that the agency has not had any majority-owned portfolio companies express interest in its SBIR program, as of March 2014 when we held our interview, so officials did not see a pressing reason to immediately opt-in.
- *Environmental Protection Agency:* Officials said that the agency currently receives many SBIR proposals and can only fund a small number of them; thus, they did not need a new pool of applicants for the program, especially considering that majority-owned portfolio company applicants could be small businesses that have better funding since they are more than 50 percent owned by venture capital operating companies, hedge funds, or private equity firms. They told us that the agency would have to do a rigorous and detailed analysis to complete the written determination and do not know what factors they would consider to make the decision.
- *National Aeronautics and Space Administration:* Officials said that the agency does not have statistically verifiable evidence to support that allowing majority-owned portfolio companies into its SBIR program would achieve the outcomes required to be enumerated in the written determination. The officials told us that firms with majority ownership by venture capital may have a low level of interest in their SBIR

program because of the long length of the research projects in this field.

- *National Science Foundation:* Officials told us that they generally did not believe they have the evidence to support that allowing majority-owned portfolio companies into its SBIR program would achieve the outcomes required to be enumerated in the written determination. For example, they told us that the agency already has an extensive relationship with the venture capital and the angel investor communities through SBIR, so they did not believe opting in would address the need for publicly funded research. Officials also said that the National Science Foundation is not an acquisition agency, so such action would not substantially contribute to the agency's mission. Finally, the officials told us that majority-owned portfolio companies have not expressed interest in the agency's SBIR program.

All but one of the agencies told us they may reevaluate their decisions in the future, but generally did not have any specific plans for doing so. For example, officials at the Department of Transportation said they could not determine the specific factors they would review when they reconsider their decision, because it is too early in the implementation of the provision to see what factors would affect their decision. Officials at the Departments of Commerce and Transportation and the Environmental Protection Agency said they are waiting to see how the change in eligibility affected ARPA-E and NIH before they reconsider implementing the change at their own agency. SBIR program managers at the Department of Defense told us that they do not plan to reevaluate their decision as they do not see a benefit in allowing such companies to participate in SBIR.

Although some agencies considered the potential interest of majority-owned portfolio companies in their SBIR programs in making their decision on whether to submit a written determination, gauging such interest can be difficult. Information on the degree of venture capital ownership in a company is confidential and proprietary and not reported to any public databases. Most participating agencies historically have not tracked whether applicants or awardees have venture capital funding. As specified in the Policy Directive, agencies must require awardees to certify their eligibility at the time of the award, including certifying whether they are majority-owned portfolio companies, but the agencies generally do not collect any detailed information on an applicant's or awardee's ownership.[21] In 2009, the National Academy of Sciences reported that between 4 percent and 12 percent of the small businesses that won SBIR phase II awards from NIH between 1992 and 2002 were majority-owned portfolio companies; however, the study did not provide any information on majority-owned portfolio company participation at other agencies.[22] Additionally, in 2006, we found that approximately 17 percent of NIH awards and 7 percent of the Department of Defense awards went to small businesses that had venture capital investment, but this study did not differentiate between majority- and minority-owned portfolio companies.[23] SBA requires companies that apply for SBIR awards to register on its Company Registry and indicate whether they are majority-owned portfolio companies. As of September 2014, 153 majority-owned portfolio companies had registered with SBA and they accounted for less than 2 percent of the total number of small businesses registered with SBA.

Data are not publicly available to gauge the interest of majority-owned portfolio companies in the SBIR program, but industry representatives indicated that such companies may not be aware of the program change and could be interested in the program. A representative from an industry association representing venture capitalists told us that because majority-owned portfolio companies have been unable to participate in SBIR previously, many of them may not be aware of the change in program eligibility at some agencies. Representatives from three industry associations told us that venture capital investment in R&D has diminished over the past decade, and representatives from two of these associations said the SBIR program is very attractive to majority-owned portfolio companies because it allows them to apply for SBIR awards to fill the gap in R&D funding. We selected a nonprobability sample and interviewed four of the majority-owned portfolio companies that registered with SBA but had not applied for an SBIR award.[24] Officials from three of

[21]ARPA-E reported that applicants are required to report venture capital funding on the "ARPA-E Other Sources of Funding" form. In addition, awardees report post-award venture capital funding in their quarterly reports submitted to ARPA-E.

[22]Committee for Capitalizing on Science, Technology, and Innovation: *Venture Funding and the NIH SBIR Program,* 2009.

[23]GAO, *Small Business Innovation Research: Information on Awards Made by NIH and DOD in Fiscal Years 2001 through 2004,* GAO-06-565 (Washington, D.C.: Apr. 14, 2006).

[24]We used a multi-step procedure to select companies that ranged in percentage of ownership by venture capital, and were not in the biotechnology or electricity industries, as these areas were covered by NIH and DOE solicitations.

the firms said that they had not seen an SBIR solicitation that fit their type of research, while officials from one firm said they still were working to determine their eligibility for the program.

Some Agencies Are Interpreting the Written Determination as a Potentially Stringent Requirement

In our discussions with the nine participating agencies that did not open their SBIR programs to majority-owned portfolio companies, we found that six agencies viewed the written determination as a potentially stringent requirement. The NDAA requires agencies to submit a written determination to SBA and Congress at least 30 days before making SBIR awards to majority-owned portfolio companies. Pursuant to the NDAA, the written determination must explain how the use of the authority to allow such companies to participate in the SBIR program will (1) induce additional venture capital, hedge fund, or private equity firm funding of small business innovations; (2) substantially contribute to the agency's mission; (3) demonstrate a need for public research; and (4) otherwise fulfill the capital needs of small business concerns for additional financing for SBIR projects.[25] According to SBA officials, the written determination is a notification letter, serving to inform SBA and Congress of the agency's plans. SBA reviews these determinations, but it does not approve or deny them.

In their written determinations, NIH and DOE supported their explanations largely based on their experience with SBIR and general knowledge about majority-owned portfolio companies. They did not conduct any independent research on majority-owned portfolio companies, which is not specifically required by NDAA, but NIH cited a 2009 study conducted by the National Academy of Sciences on its SBIR program.[26] Officials from NIH and DOE told us that they did not have any issues preparing their written determination letter. In contrast, several other agencies viewed the written determination as a potentially stringent requirement that necessitated independent analyses. For example, officials at the National Aeronautics and Space Administration said that they did not have statistically verifiable evidence that majority-owned portfolio company participation would produce the written determination outcomes, and officials at the Department of Homeland Security told us they did not

[25] 15 U.S.C. § 638(dd)(2).

[26] Committee for Capitalizing on Science, Technology, and Innovation: *Venture Funding and the NIH SBIR Program,* 2009.

have enough data to show that such companies would be interested in its SBIR program. Likewise, officials at the Department of Defense told us that they generally did not have the evidence to support that allowing majority-owned portfolio companies would achieve the written determination outcomes, and officials at the Environmental Protection Agency said they would need to conduct a rigorous analysis to make the determination. Officials at the National Science Foundation told us that they did not have the evidence to support the written determination outcomes, while a program manager at the Department of Agriculture said that the requirement is an administrative burden, and if the barrier was lower, the agency might allow majority-owned portfolio companies to participate in its SBIR program. The other three participating agencies did not discuss any issues with the written determination requirement.

As required under the NDAA, SBA updated its SBIR Policy Directive in response to the NDAA's reauthorization of, and amendments to, the SBIR program. Specifically, SBA revised the policy directive to include, among other things, the written determination requirement. The policy directive essentially uses the same language as the NDAA and does not provide any specific guidance on what evidence participating agencies may need to consider to comply with the written determination requirement. SBA officials told us that the agency's role with the participating agencies is to provide a forum for all of the program managers to discuss SBIR, including the new majority-owned portfolio company funding option. The officials said that SBA has not tried to encourage or discourage agencies to adopt the new funding option. According to the SBA officials, SBA meets routinely with SBIR program managers, and no agency has raised concerns about the written determination requirement. Similarly, most SBIR program managers told us that they have not had any discussions with SBA about whether they should allow majority-owned portfolio companies to participate in their programs, and that they meet monthly with SBA and periodically communicate with SBA officials through telephone calls and e-mail.

In its proposed and final rules implementing the NDAA provisions, SBA stated one potential benefit of the rule is to provide more businesses with access to the SBIR program, which would increase competition and the quality of proposals and spur innovation.[27] Some agencies may be

[27] 77 Fed. Reg. 75,215, 76,223 (Dec. 27, 2012) (final rule); 77 Fed. Reg. 28,520, 28,526 (May 15, 2012) (proposed rule).

viewing the evidence required for the written determination differently, and may view the written determination as a potentially stringent requirement. SBA officials told us that they are not statutorily required to advise participating agencies on what evidence they should consider in their written determination. Nonetheless, by providing additional guidance on the requirement, SBA could better inform the agencies about the evidence that they may consider in the written determination to explain how making SBIR awards to majority-owned portfolio companies will, among other things, induce additional venture capital or similar funding of small business innovation and substantially contribute to the agency's mission. As a result, agencies would be better positioned if they choose to reevaluate their decision on whether to use the majority-owned portfolio company funding option, which most agencies plan to do in the future.

Conclusion

The effect of the NDAA provisions allowing SBIR participating agencies to permit majority-owned portfolio companies to participate in their SBIR programs has been limited, because the majority of participating agencies have opted not to open their SBIR programs to such companies. As the administrator of the SBIR program, SBA updated its SBIR Policy Directive to conform to the amendments made by NDAA but did not provide specific guidance on the evidence participating agencies may consider to comply with the written determination requirement. At the same time, NIH and DOE were able to complete their written determinations, which SBA reviewed. Although the other participating agencies have not asked SBA for additional guidance on the written determination requirement, SBA also has not discussed the issue with them, such as at their monthly meetings or as part of other outreach efforts. As a result, agencies may be uncertain about the evidence necessary to support the written determination and may view the determination as a potentially stringent requirement. SBA is not responsible for encouraging or discouraging agencies to use the new authority and expand eligibility to include majority-owned portfolio companies, but SBA, as the program administrator, could be missing an opportunity to help agencies better understand the evidence required for the written determination, which could inform agencies' decisions about whether to expand their program.

Recommendations for Executive Action

To help ensure that participating agencies understand the requirements of the NDAA provisions applicable to allowing majority-owned portfolio companies to apply for SBIR awards, we recommend that the Administrator of the Small Business Administration discuss the evidence required for the written determination with the participating agencies, such as at their monthly meeting or as part of another outreach effort, and, if needed, and in consultation with the participating agencies, amend its SBIR Policy Directive to provide additional guidance.

Agency Comments and Our Evaluation

We provided a draft of this report to the Secretaries of Health and Human Services, Agriculture, Commerce, Defense, Education, Energy, Homeland Security, and Transportation; the Administrators of the Small Business Administration, the Environmental Protection Agency, and the National Aeronautics and Space Administration; and the Director of the National Science Foundation for review and comment. SBA, the Departments of Health and Human Services, Homeland Security, and Transportation, and the National Science Foundation provided technical comments, which we incorporated, as appropriate.

SBA SBIR officials provided comments on a draft of our report through an e-mail from their GAO liaison on October 29, 2014. In these comments, SBA stated that it intends to discuss the written determination with SBIR program managers at a future program managers meeting. However, SBA stated it is not required by statute to advise participating agencies on what evidence they should consider in their written determination. We clarified this in the final report. Additionally, SBA said the SBIR Policy Directive contains guidance on what the written determination must include, and participating agencies have not requested more detailed guidance on the written determination.

We maintain that our findings and recommendation on providing guidance on the written determination are appropriate. As we noted above, SBA may not be required by law to advise agencies on the evidence they may use to support the written determination, but SBA could be missing an opportunity as program administrator to help agencies make a more informed decision about whether to expand their SBIR program. SBA notes that the SBIR Policy Directive contains guidance on the written determination and no agency has requested more detailed guidance. However, we found that participating agencies were viewing the evidence required for the written determination differently. Specifically, six of the nine agencies that have not opted to expand their program viewed the written determination as potentially stringent, possibly requiring independent analysis, while the two agencies that opted to expand their program viewed the written determination as a less stringent requirement. Our recommendation addresses this issue, and SBA's plan to discuss the written determination with SBIR program managers at a future meeting is consistent with our recommendation.

We are sending copies of this report to the Secretaries of Health and Human Services, Agriculture, Commerce, Defense, Education, Energy, Homeland Security, and Transportation; the Administrators of the Small Business Administration, the Environmental Protection Agency, and the National Aeronautics and Space Administration; the Director of the National Science Foundation; the appropriate congressional committees; and other interested parties. The report is available at no charge on the GAO website at http://www.gao.gov. If you or your staff members have any questions about this report, please contact me at (202) 512-8678 or brownbarnesc@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix I.

Cindy S. Barnes

Cindy Brown Barnes
Director, Financial Markets and
Community Investment

Appendix I: GAO Contact and Staff Acknowledgments

GAO Contact

Cindy Brown Barnes, (202) 512-8678 or brownbarnesc@gao.gov

Staff Acknowledgments

In addition to the contact named above, Richard Tsuhara (Assistant Director), Kathleen Boggs (Analyst-in-Charge), Hilary Benedict, William Chatlos, Alma Laris, Marc Molino, Patricia Moye, Christopher Murray, and Jennifer Schwartz made key contributions to this report.

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