Small Business Innovation Research (SBIR) Program

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December 16, 2011

Congressional Research Service
7-5700
www.crs.gov
96-402

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

In 1982, the Small Business Innovation Development Act (P.L. 97-219) established Small Business Innovation Research (SBIR) programs within the major federal research and development (R&D) agencies designed to increase participation of small innovative companies in federally funded R&D. Government agencies with R&D budgets of $100 million or more are required to set aside a portion of these funds to finance the SBIR activity. Through FY2009, over 112,500 awards have been made totaling more than $26.9 billion.

Reauthorized several times over the years, the SBIR program was scheduled to terminate on September 30, 2008. A companion pilot activity, the Small Business Technology Transfer (STTR) program, was scheduled to end the following year. A series of temporary extensions kept both programs in operation until the SBIR/STTR Reauthorization Act of 2011 was enacted as Title LI of the National Defense Authorization Act for Fiscal Year 2012.

In general, the new legislation reauthorizes the SBIR and STTR programs through September 30, 2017; incrementally increases the set aside for the SBIR effort to 3.2% by FY2017 and beyond; incrementally expands the set aside for the STTR activity to 0.45% in FY2016 and beyond; increases the amount of Phase I and Phase II awards; allows the National Institutes of Health, the Department of Energy, and the National Science Foundation to award up to 25% of SBIR funds to small businesses that are majority-owned by venture capital companies, hedge funds, or private equity firms and other agencies to award up to 15% of SBIR funds to such firms; creates commercialization pilot programs; and expands oversight activities, among other things. [For further information on SBIR reauthorization activity see CRS Report RS22865, *The Small Business Innovation Research (SBIR) Program: Reauthorization Efforts*, by Wendy H. Schacht.]

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Program Description

The Small Business Innovation Research (SBIR) program is designed to increase the participation of small, high technology firms in the federal R&D endeavor. Congressional support for the initiative was predicated upon the belief that while technology-based companies under 500 employees tended to be highly innovative, and innovation is essential to the economic well-being of the United States, these businesses were underrepresented in government R&D activities. Agency SBIR programs guarantee this sector a portion of the government's R&D budget to compensate for what was viewed as a preference for contracting with large firms.

Current law requires that every federal department with an R&D budget of $100 million or more establish and operate an SBIR program. A set percentage of that agency's applicable extramural research and development budget—originally at 1.25%, now at 2.5%—is to be used to support mission-related work in small companies.

The objectives of the SBIR program include stimulation of technological innovation in the small business sector, increased use of this community to meet the government's R&D needs, additional involvement of minority and disadvantaged individuals in the process, and expanded commercialization of the results of federally funded R&D. To achieve this, agency SBIR efforts involve a three-phase activity. Until last year, first phase awards of up to $100,000 for six months were provided to evaluate a concept's scientific or technical merit and feasibility. As of March 30, 2010, the Small Business Administration (SBA) issued a Policy Directive that increased the amount of Phase I awards to $150,000.[1] The project must be of interest to and coincide with the mission of the supporting organization. Projects that demonstrate potential after the initial endeavor may compete for Phase II awards of originally up to $750,000, now up to $1 million per the above Policy Directive, and lasting one to two years. Phase II awards are for the performance of the principal R&D by the small firm. Phase III funding, directed at the commercialization of the product or process, is expected to be generated in the private sector. Federal dollars may be used if the government perceives that the final technology or technique will meet public needs. P.L. 102-564 directed agencies to weigh commercial potential as an additional factor in evaluating SBIR proposals.

Eleven departments currently have SBIR programs including the Departments of Agriculture, Commerce, Defense (DOD), Education, Energy, Health and Human Services, Homeland Security, and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration (NASA); and the National Science Foundation (NSF). Each agency's SBIR activity reflects that organization's management style. Individual departments select R&D interests, administer program operations, and control financial support. Funding can be disbursed in the form of contracts, grants, or cooperative agreements. Separate agency solicitations are issued at established times.

The Small Business Administration is responsible for establishing the broad policy and guidelines under which individual departments operate SBIR programs. The agency monitors and reports to Congress on the conduct of the separate departmental activities. Prior to the December 2011 reauthorization legislation, criteria for eligibility in the SBIR program included companies that

[1] See the Federal Register, Vol. 75, No. 60, Tuesday, March 30, 2010, 15756, available at http://www.acq.osd.mil/osbp/sbir/overview/SBA%20Increase%20in%20Award%20Thresholds%20-%20Federal%20Register%20(30%20March%202010).pdf.

are independently owned and operated; not dominant in the field of research proposed; for profit; the employer of 500 or less people; the primary employer of the principal investigator; and at least 51% owned by one or more U.S. citizens or lawfully admitted permanent resident aliens. A rule change, effective January 3, 2005, permits subsidiaries of SBIR-eligible companies to participate as long as the parent company meets all SBIR requirements.

A pilot effort to encourage commercialization of university and federal laboratory R&D by small companies was created by P.L. 102-564 and reauthorized several times through FY2009. The Small Business Technology Transfer program (STTR) provides funding for research proposals that are developed and executed cooperatively between a small firm and a scientist in a research organization and fall under the mission requirements of the federal funding agency. Up to $100,000 in Phase I financing is available for one year; Phase II awards of up to $750,000 may be made for two years. Currently funded by a set-aside of 0.3% of the extramural R&D budget of departments that spend over $1 billion per year on this effort, the Departments of Energy, Defense, and Health and Human Services, NASA, and NSF participate in the STTR program.

Legislative Changes

In December 2011, Congress enacted the SBIR/STTR Reauthorization Act of 2011 as Title LI of the National Defense Authorization Act for Fiscal Year 2012. This legislation extends the SBIR and STTR programs through September 30, 2017.

The new law also makes several major changes to the existing programs. The SBIR set-aside is increased from 2.5% in FY2011 by 0.1% per year up to 3.0% in FY2016, and to 3.2% in FY2017 and beyond. The set-aside for the STTR activity is increased from 0.3% in FY2011 to 0.35% in FY2012 and FY2013; to 0.40% in FY2014 and FY2015; and to 0.45 in FY2016 and beyond.

Phase I SBIR and STTR awards are increased from $100,000 to $150,000 and Phase II SBIR and STTR awards are increased from $750,000 to $1,000,000. Awards cannot exceed the amount guidelines by more than 50% unless an exception is made for one topic to meet agency research requirements.

A recipient of a Phase I grant from one federal agency is permitted to apply for a Phase II award from another agency to pursue the original work. A small business is allowed to switch between the SBIR and STTR programs. Duplicative awards are not permitted.

A new pilot program is created in DOD, the Department of Education, and the National Institutes of Health (NIH) to permit the award of a Phase II grant without the small business receiving a prior Phase I grant.

Also at NIH, a new "Phase 0 proof of concept partnership program" is established to "accelerate the creation of small businesses and the commercialization of research innovations" from universities or other research institutions that participate in the NIH STTR program.

Phase III awards are to go to companies that developed the technologies in Phase I and Phase II and all grants are to be made on a competitive and merit-based basis.

Perhaps the most contentious issue was that of permitting majority venture capital owned small companies to receive grants under the SBIR and STTR programs. In what might be considered a

compromise position, the new law permits NIH, DOE, and NSF to award not more than 25% of SBIR funds to "small business concerns that are owned in majority part by multiple venture capital operating companies, hedge funds, or private equity firms through competitive, merit-based procedures that are open to all eligible small business concerns." Other federal agencies may not award more than 15% of SBIR funds to "small business concerns that are owned in majority part by multiple venture capital operating companies, hedge funds, or private equity firms through competitive, merit-based procedures that are open to all eligible small business concerns."

In order to promote the use of federally funded research and development, the legislation provides for commercialization pilot programs for Phase II SBIR and STTR technologies in DOD and the civilian agencies. It also encourages the award of SBIR and STTR grants to small businesses that work with federal laboratories or are involved in cooperative research and development agreements (CRADAs). Agencies are required to establish minimum performance standards to measure the commercialization success of awardees.

A pilot program is created to permit no more than 3% of SBIR program funds to be used for administrative activities, oversight, and contract processing. As part of this pilot program, a portion of these funds are to be used to increase participation of states which have traditionally received low levels of SBIR awards.

To ensure additional program oversight, the legislation provides for an interagency policy committee and agencies are to report on advanced manufacturing activities in the SBIR program. Also mandated are the creation and maintenance of data bases collecting relevant information on the SBIR and STTR programs for use by both the government and the public sector. Tracking of multiple Phase I awardees that do not receive Phase II grants is also required.

The Comptroller General is to audit agency calculation of extramural research and GAO is mandated to undertake a study on venture capital operating company, hedge fund, and private equity firm involvement in the program.

Provisions to prevent "waste, fraud, and abuse" in the SBIR program are included and the law limits new pilot programs created under this legislation to three years of operation.

Implementation

The Government Accountability Office (GAO; formerly the General Accounting Office) is legislatively directed to assess the implementation of the Small Business Innovation Development Act, as amended, and has issued a series of reports documenting its findings. A 1987 study found that both the evaluation and selection processes were sufficient to "reasonably" insure awards were based on technical merit. It was also determined that the majority of agencies were not awarding Phase I grants and contracts within the six-month time frame required by the SBA guidelines. Another GAO report the following month surveyed the participants and noted that most were "generally satisfied" with the administration of SBIR programs.

In 1989, GAO reported that agency heads found the SBIR effort to be beneficial and met the organization's R&D needs. Most indicated that the "SBIR programs had developed new research areas, placed more emphasis on the application of research results, and led to wider use of small businesses as research performers." The study concluded that projects were, for the most part, of

high quality. At DOD and NASA, however, SBIR efforts stressed R&D to meet agency mission requirements in contrast to other SBIR programs that focused on commercialization for private sector markets. All of the departments stated that SBIR projects, when compared with other research activities, had greater potential to result in new products and processes.

Testimony presented by GAO in 1991 stated that the program "clearly is doing what Congress asked it to do in achieving commercial sales and developmental funding from the private sector." An SBA study found that approximately one in four SBIR projects will result in the sale of new commercial products or processes. Another GAO report issued in May 1992 noted that despite a short time frame and the fact that many SBIR projects had not had sufficient time to mature into marketable technologies and techniques, "the program is showing success in Phase III activity." As of July 1991, almost two-thirds of the projects already had sales or received additional funding (primarily from the private sector) totaling approximately $1.1 billion.

The 1992 study also identified several issues for possible further congressional exploration. According to GAO, DOD placed less emphasis on commercialization than other agencies and utilized the SBIR program primarily to address the department's R&D needs. Questions were raised about the requirements for competitive bidding when companies looked to federal departments for Phase III contracts after successfully completing Phases I and II. GAO noted that clarification of the Competition in Contracting Act of 1984 (as amended) might be necessary. In addition, there was disagreement over whether the federal agency or the small firm should continue to work on technology development after the cessation of SBIR project funding. GAO also concluded that firms receiving multiple Phase II awards tended to have lower Phase III sales and less additional developmental support. The reasons for this remained unclear, but the suggestion was made that these companies may have focused on securing funds through SBIR awards rather than through commercialization of their R&D results.

A March 1995 GAO report found that multiple Phase II funding had become a problem, particularly at NSF, NASA, and DOD. Among the reasons cited were the failure of companies to identify identical proposals made elsewhere in violation of the mandatory certification procedure; uncertainty in definitions and guidelines concerning "similar" research; and lack of interagency mechanisms to exchange information on projects. Several recommendations were made to address duplication. GAO testimony presented in March 1996 indicated that the SBA had taken steps to implement these suggestions. The study also determined that the quality of research appeared to have "kept pace" with the program's expansion, although it was still too early to make a definitive judgment. Factors supporting this assessment included the substantive level of competition, more proposals deemed meritorious than could be funded by agencies, and appraisals by departmental SBIR personnel indicating the high quality of submissions.

Another GAO study, released in April 1998, noted that between 35% and 50% of SBIR projects had resulted in sales or additional private sector investment. Despite earlier indications of problems associated with multiple award winners, this report found that such firms have similar commercialization rates as single awardees. Critical technology lists were being used to determine agency solicitations and there was little evidence of participation by foreign firms. While several agencies had new programs to assure continuity in funding, there were indications of possible inaccuracies in defining the extramural R&D budgets upon which the set-aside is based.

The June 1999 GAO analysis reported that SBIR awards tend to be concentrated both geographically and by firm despite widespread participation in the program. "The 25 most

frequent winners, which represent fewer than 1 percent of the companies in the program, received about 11 percent of the program's awards from fiscal year 1983 through fiscal year 1997." Businesses in a small number of states, particularly California and Massachusetts, were awarded the most number of projects. The study also noted that while commercial potential is considered by all agencies, each has developed different evaluation approaches. Other goals, including innovation and responsiveness to agency mission, still remain important in determining awards.

A more recent report by GAO (June 2005) found that it is still difficult to adequately "assess the performance of the SBIR program" although the effort appears to be achieving its goal of "enhanced" participation of small business in the R&D enterprise. Utilizing "commercialization" as a measure may not be sufficient because other agency goals were being met such as research needs or expanded innovation. Success in the commercial market did not take into account the R&D requirements of departments like DOD or NASA. In a report the following year (October 2006), GAO noted that the agencies reporting to the SBA did not always provide the necessary data in the format required by SBA. GAO concluded that the "agencies need to strengthen [their] efforts to improve the completeness, consistency, and accuracy of awards data."

Data collection remains an issue according to several recent reports. An August 2009 GAO study reiterated past GAO findings of deficiencies in the SBA Tech-Net system designed to collect information from agency SBIR programs. This report noted that "Although SBA did not meet its statutorily mandated deadline of June 2001, the database has been operational since October 2008, and contains limited new information but may also contain inaccurate historical data."[2] A November 2010 report issued by the Office of the Inspector General, U.S. Small Business Administration noted that "limited progress" had been made on Tech-Net and that

> Participating agencies were still experiencing difficulty in searching the database for duplicative awards and other indicators of fraud because information in the Tech-Net database was incomplete, and the search capabilities of the system were limited…. Additionally, SBA had not developed the government-use component of Tech-Net to capture information on the commercialization of SBIR research and development projects. However, SBA recently allocated $1.25 million and has begun the acquisition process to enhance and expand the Tech-Net database.[3]

GAO also has evaluated the STTR program. A January 1996 report found that, in general, federal agencies favorably rated the quality of winning proposals (in the first year) and that most projects had commercial potential, although the costs might be high. The government had taken steps to avoid potential conflicts of interest between federal laboratories and departmental headquarters. There was no indication that this pilot effort was competing for proposals with the established SBIR activity or "reducing the quality of the agencies' R&D in general." Instead it was credited for encouraging collaborative work. Yet, GAO noted that because the programs are so similar, there are questions whether or not a separate activity is necessary. Any real evaluation of success in technology transfer, however, could not be accomplished for several years because of the time needed to bring the results of R&D to the commercial marketplace. These findings were reiterated in testimony given by GAO in May and September 1997.

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[2] Government Accountability Office, *Small Business Innovation Research: Observations on Agencies' Data Collection and Eligibility Determination Efforts*, GAO-09-956T, August 6, 2009, 11.

[3] Small Business Administration, Office of the Inspector General, *Usefulness of the Small Business Innovation Research Tech-Net Database*, Report Number 11-02, November 12, 2010, 3, available at http://www.sba.gov/sites/default/files/oig_report_11_02.pdf.

A June 2001 GAO study of all companies which received STTR awards between FY1995 and FY1997 noted the participant's belief that both the firms and the research institutions contributed to expanded R&D although the private sector was more influential in determining the direction of the research. The companies "reported about $132 million in total sales and about $53 million in additional developmental funding." They identified 41 new patents and the creation of 12 new spin-off firms. Further, the awardees preferred that the STTR program remain separate from the SBIR activity.

Awards

According to the SBA's 2010 report to the President on *The Small Business Economy*, from its inception in FY1983 through FY2009, over 112,500 awards have been made totaling more than $26.9 billion.[4] **Table 1** summarizes the funding and the number of projects selected for the SBIR program. Information on the STTR program is contained in **Table 2** and is compiled from data provided by the SBA Office of Technology.

Table 1. SBIR Program: Dollars Awarded and Projects Funded

Fiscal Year	Number of Phase I Awards	Number of Phase II Awards	Total Number of Awards	Total Dollars Awarded (millions of dollars)
FY1983	686	74	760	44.5
FY1984	999	338	1,337	108.4
FY1985	1,397	407	1,804	199.1
FY1986	1,945	564	2,509	297.9
FY1987	2,189	768	2,957	350.5
FY1988	2,013	711	2,724	389.1
FY1989	2,137	749	2,886	431.9
FY1990	2,346	837	3,183	460.7
FY1991	2,553	788	3,341	483.1
FY1992	2,559	916	3,475	508.4
FY1993	2,898	1,141	4,039	698.0
FY1994	3,102	928	4,030	717.6
FY1995	3,085	1,263	4,348	981.7
FY1996	2,841	1,191	4,032	916.3
FY1997	3,371	1,404	4,775	1,066.7
FY1998	3,022	1,320	4,342	1,100.0
FY1999	3,334	1,256	4,590	1,096.5
FY2000	3,172	1,335	4,507	1,190.2

[4] Small Business Administration, *The Small Business Economy 2010, A Report to the President*, 51-52, available at http://www.sba.gov/sites/default/files/sb_econ2010.pdf.

FY2001	3,215	1,533	4,748	1,294.4
FY2002	4,243	1,577	5,820	1,434.8
FY2003	4,465	1,759	6,224	1,670.1
FY2004	4,638	2,013	6,651	1,867.4
FY2005	4,300	1,871	6,171	2,029.8
FY2006	3,836	2,026	5,862	2,113.9
FY2007	3,909	1,615	5,356	1,777.6
FY2008	3,832	1,851	5,683	1,785.7
FY2009	4,008	1,801	5,809	1,937.7

Source: U.S. Small Business Administration, *The Small Business Economy 2010, A Report to the President*, available at http://www.sba.gov/sites/default/files/sb_econ2010.pdf.

Table 2. STTR Program: Dollars Awarded and Projects Funded

Fiscal Year	Dollars Awarded (millions)			Awards		
	Phase I	Phase II	Total	Phase I	Phase II	Total
FY1994	18.9	—	18.9	198	—	198
FY1995	23	10.7	33.7	238	22	260
FY1996	22.7	41.8	64.5	238	88	326
FY1997	24.2	44.9	69.1	260	89	349
FY1998	19.7	45.1	64.8	208	109	317
FY1999	24.3	40.6	64.9	251	78	329
FY2000	23.9	45.9	69.8	233	95	328
FY2001	24.2	53.2	77.4	224	113	337
FY2002	36.4	55.4	91.8	356	114	470
FY2003	41.1	50.7	91.8	397	111	508
FY2004	79.7	110.3	190	674	195	869
FY2005	73.9	146.4	220.3	611	221	832
FY2006	74.0	152.3	226.3	644	234	878
FY2007	83.5	159.4	242.9	634	213	847
FY2008	61.2	178.4	239.6	483	251	734

Source: Small Business Administration data.

Issues for Consideration

Much of the debate over the reauthorization of the SBIR and STTR programs revolved around the regulations that require at least 51% ownership by an individual or individuals. Some experts argued participation by small firms that are majority-owned by venture capital companies should

be permitted. Proponents of this change maintain that, particularly in the biotechnology sector, the most innovative companies are not able to use the SBIR program because they do not meet these ownership criteria. Opponents of altering the eligibility requirements argued that the program is designed to provide financial assistance where venture capital is not available. They assert that the program's objective is to bring new concepts to the point where private sector investment is feasible. While the new law permits limited participation by majority venture capital owned companies, it remains to be determined how this will affect the goals of the two programs.

As the new legislation is implemented, the Congress may wish to explore how the new provisions impact program operation. Additional issues that might be addressed include whether the problems identified by GAO associated with the duplication of awards has been adequately resolved. Some experts question whether the SBIR and STTR programs are meeting their different mandated objectives and assert that they are serving identical purposes. Other critics maintain that the government has no role in directly supporting industrial research and development. These and other issues may be debated as the SBIR and STTR programs continue to function through September 30, 2017.

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