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SBIR at the National Science Foundation

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Methodology

- Research Tools:
  - Surveys
  - Case Studies
  - Workshops
  - Interviews
  - Agency data
  - Literature Review
- 2011 Academies Survey
  - Effective population surveyed: 408; 44.6% response rate
  - Report discusses sources and directions of biases

The NSF SBIR program is meeting 3 of 4 legislative objectives:

- Stimulating technological innovation;
- Using small business to meet Federal R/R&D needs;
- Increasing private sector commercialization of innovations derived from Federal R/R&D, thereby increasing competition, productivity and economic growth.
- We find that more needs to be done to “foster and encourage participation by socially and economically disadvantaged small businesses (SDBs), and by women-owned small businesses (WOSBs), in technological innovation.”

The SBIR program at NSF is having a positive impact on SBCs

- SBIR funding makes a significant difference in the founding of small innovative companies and the decision to proceed with a specific project:
  - 45 percent of survey respondents reported that the SBIR program played a role in company foundation, and
  - Almost 70 percent of Phase II respondents believed that the surveyed project probably or certainly would not have proceeded without Phase II funding.
- Survey respondents reported that the SBIR had profoundly positive long-term impacts on their small company.
  - More than one-third of Phase II respondents reported that SBIR had a “transformative effect,” and
  - 88 percent reported a substantial positive effect or a transformative effect.

Substantial Commercialization

- SBIR-funded projects at NSF tend to reach the market in large numbers.
  - About 70 percent of surveyed Phase II projects reported sales of related products or services, and
  - almost two-thirds of the remainder expected sales in the future.
- But the scale of commercialization is not large for most projects.
  - Of those Phase II projects experiencing sales from the funded technology, only about 9 percent reported sales of $5 million or more.
  - A few projects produce most of the commercial impact.
- More than 60 percent of Phase II survey respondents reported receiving follow-on funding.

The Phase II-B Program Works

- The Phase IIB Supplement is designed to bridge the funding gap between the end of SBIR Phase II and the start of commercial revenues or investment.
  - Third-party validation is provided by the requirement that companies match Phase IIB funds at least 2:1
  - The maximum size of an NSF Phase IIB award is $500,000.
- Survey of Phase IIB projects shows increased commercialization and larger revenues.
  - Phase IIB projects reach the market at a high rate – 81 percent of surveyed Phase II projects reported that they had achieved some sales.
  - Just under half of the respondents to the Phase IIB survey report that their products, processes, or services are in use today.
  - By requiring matching funds, the Phase IIB program provides incentives for firms to acquire additional investment.
  - Companies had remarkably positive views of the impact of Phase IIB funding on both their projects and their companies as a whole.

Recommendations

While the NSF SBIR program generates substantially positive outcomes, the committee has identified a series of recommendations to improve its processes and outcomes.

Broaden Perspective on Commercialization

- The current approach is tightly focused on a venture capital model of commercialization.
  - NSF should review its conceptual approach to commercialization with a view to ensuring that different paths to commercial success are fully included, such as angel funding and strategic investments by other companies.
- In addition, NSF should explore newer alternatives – for example, open source models or use of equity crowdfunding.
  - This is to some degree implicit in the I-Corps model, and NSF should ensure that its grantees are aware of alternative funding paths.

Build on Phase II-B Success

- Consider expanding the size of the Phase II-B program.
  - NSF should not increase the dollars per Phase II-B maximum award if that reduces the number of Phase II-B awards.
- Clarify the criteria under which funding qualifies as an acceptable match for Phase II-B purposes.
  - Explore allowing the limited use of some specified in-kind contributions as part or all of the matching funds.
- Review the requirement that matching funds be developed during the timeline of the Phase II.

Improve Monitoring, Evaluation, and Assessment

- Data collected through the current process are a good start but are far from sufficient to underpin a data driven program.
  - NSF should more systematically collect a range of quantitative data and standardize key questions to improve program evaluation, management, and outcomes.
  - NSF should track commercialization outcomes using multiple metrics.
  - NSF should explore the development of an integrated information management system to improve the management of its SBIR program.
- The SBIR/STTR program should provide a comprehensive annual report to the National Science Board and Congress and the public on its operations.

Address under-served populations

- NSF should immediately examine past and current efforts to address the clear Congressional mandate to foster the participation of under-served populations in the SBIR program.
- It should examine and report on best practices and create benchmarks to relate the impact of such activities.
  - Quotas are not necessary.
  - Develop new benchmarks and metrics
  - Disaggregate measures of the participation of socially disadvantaged groups by race/ethnicity.
- Investigate why efforts to date to expand the participation of under-served populations have been largely unsuccessful.
- Ensure that there are no biases in the selection process that are adversely affecting the selection of women and minorities.

Thank you.