

## ASTRA Innovation Policy Papers

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### The Myth of the "Mills": SBIR and multiple award winners<sup>1</sup>

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<sup>1</sup> This article is based on the research conducted by the National Academy in the course of developing a six-volume report on the SBIR program at DoD, NIH, NSF, DoE, and NASA. See [National Academies SBIR Home Page](#) for links to reports. **NOTE: All opinions expressed here are those of the authors, not of the National Academy.**

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#### 1. Introduction

The SBIR program is widely viewed as a success story that underscores the pivotal role of Federal funding in addressing funding gaps experienced by many early stage technology firms as they race to reach the market before seed capital runs out. Operated separately by each Federal agency with significant R&D responsibilities, the program provides about \$2BN annually for small research firms.

However, one consistent criticism of the SBIR program is that some firms "game" the system by winning numerous awards but failing to commercialize these results – a core objective of the program.. These frequent winners are often referred to as "SBIR mills." They consider SBIR awards to be an integral part of their business model, and – critics argue – soak up funding that could be better spent on firms more closely focused on commercializing their research.<sup>4</sup>

This critique has gained some traction; some Congressional staffers believe that limits should be placed on the number of awards a single firm can win. At NSF, firms are already limited to four applications annually.

We believe both the critique and the resulting policy adjustments are profoundly misplaced: the problem of the "mills" is indeed a myth, for five interlocking reasons:

- first and foremost, the scale of the problem is overstated: only

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<sup>4</sup> See U.S. Small Business Administration Statement of Administrator Steven C. Preston House Small Business Committee Reauthorization of the Small Business Innovation Research Program March 13, 2008

a small number of firms, indeed very few, win any significant number of awards

- the purported problem – reduced commercialization - is also overstated. Overall, firms that win multiple awards generate on average more commercial returns per project than firms with fewer awards
- commercial returns are only one objective of the program. Congress has mandated other equally important objectives, which these firms help to meet
- some of the most criticized firms are no longer eligible for the program
- finally, the cure – limiting applications - is much worse than the disease

## 2 How many mills are there? And how many awards do they get?

In part, the answer here varies by agency. At the agencies with more limited funding, there simply are not enough awards available to support a company of any significant size. The biggest winner as NSF received 12 Phase II awards from 1996-2003;<sup>5</sup>

In contrast, some firms have been highly successful in winning awards at DoD, where 10 firms had at least 75 Phase II awards 1992-2005 inclusive,

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<sup>5</sup> This is the study period covered by the recent NRC report. See NRC An Assessment of the SBIR Program at NSF, <http://www.nap.edu/catalog/11929.html> p.72

accounting for 17.6% of all awards during this period. Less than 1% of firms received at least 25 Phase II awards – about two per year.<sup>6</sup>

Clearly, then, a small number of firms have been heavily focused on SBIR and have been successful in winning a lot of awards at some agencies. From the government's perspective, is this a problem?

## 3 What commercial results do they generate?

One of the core critiques against SBIR "mills" is that these are essentially contract research operations, providing sufficient services to attract more SBIR awards, but never making any real effort to commercialize their work independently of the SBIR program.

This critique is fundamentally misplaced. The plain fact is this: looked at in aggregate, firms with the largest numbers of awards on average generate more commercial results, not less, per project than firms with few awards.

The following table is taken from the DoD CCR database, which closely tracks commercial outcomes related to SBIR awards at DoD and other agencies.<sup>7</sup> It is the most accurate available gauge of outcomes at DoD, and provides some

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<sup>6</sup> See NRC, An Assessment of the Small Business Innovation Research Program at the Department of Defense (2007.) [http://books.nap.edu/openbook.php?record\\_id=11963&page=66](http://books.nap.edu/openbook.php?record_id=11963&page=66) p.66

<sup>7</sup> The Company Commercialization Record (CCR) reports company commercialization outcomes for all Phase II awards for the company. It is updated each time the company applies for anew SBIR awards at DoD.

insight into activities at other agencies as well. As the "mills" argument is applied most often to firms

preponderantly operating within DoD, it is especially relevant there:

# of Phase II SBIR per Firm*	# of Firms	# of Projects in CCR database	# of Projects with Award Years prior to 2004	Average Commercialization of projects with Award Years prior to 2004	Average Sales of projects with Award Years prior to 2004	Average Funding of projects with Award Years prior to 2004
>125 projects	5	941	823	\$2,067,719	\$1,384,571	\$683,148
>75 and <110 (no firms had between 111 and 124 projects)	5	485	411	\$1,117,325	\$526,623	\$590,703
>50 and <75	17	1067	945	\$4,103,125	\$3,586,611	\$516,514
>25 and <50	77	2692	2330	\$1,710,140	\$1,048,787	\$661,354
>15 and <25	101	1858	1535	\$1,375,061	\$863,310	\$511,750
>0 and <15	2715	8101	6243	\$1,300,886	\$751,418	\$549,468
* Awards are all Phase II from any agency, not just DoD awards						

These results are telling. They indicate that on average Phase II awards to firms with the most awards in fact generate more sales/revenues than do awards made to any other group – firms with more than 125 Phase II awards generated on average more than 50% more commercialization per project than firms with less than 15 awards. Indeed, the biggest winners were even more focused on sales than firms with few wins: 67% of commercialization for the biggest winners came from sales revenues, while only 57% came from sales for firms with fewest awards.

Many possible factors can help to explain these differences. The most

prolific winners are, typically, larger than firms with a handful of awards. They have often been in business longer, and have developed a better marketing network, especially within the somewhat arcane environment of DoD acquisitions.

Still, the bottom line is clear. Multiple award winners do not commercialize less than firms with few awards – on the contrary, they commercialize more.

#### 4 Agency mission and knowledge effects: meeting other SBIR objectives

The “mills” argument is also badly mistaken in its exclusive focus on commercialization. In fact, this is only one objective among the four detailed by Congress in the legislation. And at DoD in particular – which accounts for half of the overall program and much of the “mills” critique – a successful SBIR is defined not in terms of the revenues that it generates, but in terms of solving technical problems for DoD weapons systems.

It is therefore worth stressing that firms don't win SBIR awards on the basis of a lottery: the win awards because they can satisfy clients in the agencies. Three characteristics of multiple award winners are noted in the National Academy review,

- **Selection process.** All agency selection procedures are designed specifically to ensure that selected projects will help to meet agency needs. The Academy found no projects that were obviously misaligned with agency mission.
- **Repeat custom.** The fact that these firms consistently win awards suggests that they continue to provide effective services to their clients and customers – particularly as they have won awards at multiple agencies and multiple components, under different selection models and with different selection officials.

- **Specific projects.** All agencies maintain databases of “success stories” – projects funded by SBIR that were in the view of the agency noteworthy and successful. Multiple award winners are plentifully represented here.

In short, no critique of SBIR “mills” has established that these firms provide less value to the agencies than other firms. On the contrary, evidence from the National Academy review strongly suggests that the agencies are generally satisfied with the performance of these firms.

So far as knowledge effects are concerted, there is no evidence that multiple award winners generate fewer patents, publications, and other indicators of technical knowledge than do firms with fewer awards, on a per award basis.

## 5 Ongoing eligibility

Given the very small number of firms at issue, it is worth noting that some of the most prolific award winners are no longer eligible for future SBIR awards, and hence are no longer a problem even for critics of the “mills.” Foster-Miller, the most prolific of all, was acquired by a foreign corporation, making the firm ineligible. DSR is no longer independent.

Firms become ineligible because they are acquired, because they become too large, because their ownership structure changes in

some specific ways, and they become predominantly institution-owned.

This strongly suggests that counter-measures against "mills" are in fact being targeted at a declining handful of firms.

## 6 Why the cure is worse than the disease

Finally, we should consider possible effects of solutions to the "problem" of the "mills."

Most solutions are simple – they suggest that firms be allowed to apply for (or in some circumstances, win) no more than a set number of awards in a given fiscal year once the firm has reached a certain threshold for cumulative awards.

But this approach raises a stream of questions and concerns:

- **Who decides** which projects to accept? If it is the firm, their priorities may not be those of the agencies, and critically important research may not be done.
- **How many is "enough"?** Should the bar be set at 3 Phase II awards, four, five, ten? On what basis is this determined?
- **Should Phase I awards be limited, Phase II, or both.** There are some Phase I "mills," which seem to specialize in winning Phase I

awards. But Phase I awards can provide valuable results even if they are technical failures: as Edison famously observed, "I now know 2000 ways not to make a light bulb."

- **One year or cumulative?** Even the most prolific multiple award winners rarely receive more than a handful of Phase II awards in a single year. So should limits be imposed on a single year or multiple years? Over time, and the SBIR program has been making awards for 25 years, the cumulative number of awards will rise.
- **Coordination.** Firms apply separately to different agencies, which hold competitions at different times. How should this be coordinated? Or should the limits, if any, be on an agency by agency basis.
- **Exceptions.** What if an agency identifies a firm as having unique capabilities needed for a high priority project – but with no remaining allowable SBIR awards?

In the end, of course, firms can easily circumvent such regulations by reincorporating under a different name, which would presumably make the quantitative limits moot.

We therefore believe award and application limits to be both impractical and ineffective.

## 7 Conclusions

Critiques of the SBIR "mills" reflect a profound misunderstanding of the purposes of the SBIR program, as well as the limited data available prior to release of the National Academy studies.

Understanding that there are multiple goals, drawing on the NRC's commercialization data, and reviewing the practical implications of award limits lead inescapably to a single conclusion: there is no good

case for imposing further limitations on access to the SBIR programs for small businesses based on the number of awards they have won in the past. The only meaningful criteria are the needs of the agency, the quality of the proposal, and the past performance of the applicant.

Imposing limits is risky for the SBIR program, and would likely prove hard to design and harder yet to administer. That is why the Academy recommended that the only existing limit – imposed at NSF primarily for administrative convenience – be discontinued.