The SBIR Program: making investments in innovation

In a world where large businesses and universities rule, the Small Business Administration's (SBA) Small Business Innovation Research (SBIR) Program encourages small businesses in the United States to seek federal Research & Development funding, and is at the heart of stimulating technological and scientific innovation in the country. Start-ups and small companies can realise their technological potential with the non-dilutive seed funding support of SBIR. The SBIR Program Director **John Williams** talks to *Research Features* about how the program works and the impact it has.

Finding and applying for funding from both federal and private investors is a hugely complicated and difficult process, especially for small and inexperienced technological and scientific companies and entrepreneurs. The Small Business Innovation Research (SBIR) Program is a fixed level of non-dilutive seed funding for high tech-focused small businesses and start-ups operated by 11 participating federal agencies but overseen by the US Small Business Administration (SBA). Through their various outreach programmes such as Federal and State Technology Partnership (FAST), Growth Accelerator and SBIR Road Tour Programs, the SBIR Program seeks out the brightest next generation technology focused ideas and helps people navigate the daunting application process.

In this interview, Director John Williams explains what the Program is about and where it stands in the United States in terms of technological and scientific development.

Hello John! Could you tell me a little bit about your role as the Director of the Small Business Innovation Research (SBIR) Program and what it involves?
I became SBIR Director in December 2014. The role has included monitoring of the 11 federal agency programmes and the $2.5 billion in annual funding, working with Congress and implementing policy, leading national outreach, as well as overseeing some four or five thousand new awards per year. At SBA we do not hand out any money ourselves. We are a policy and oversight organisation; looking at trends and seeing how the Program should move in the future. This includes things like focusing on manufacturing or whatever is politically hot, but also stepping back; how do we expand the Program? Should we push more commercialisation assistance as opposed to just research? We are trying to focus on the different agencies, how they attract new companies and why some constantly stay with old companies.

Can you tell me a bit about the SBIR in more detail and the relationship with the ▶

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Small Business Technology Transfer (STTR)?
The SBIR Program is a basically a tax on the Research & Development budget of federal agencies funding that would normally go to big businesses and universities. When SBIR was implemented in 1982, there was pushback from the university community especially as the set-aside level increased so in 1992, Congress created the STTR Program which required 30% of the funding to be subcontracted to universities. In reality, a high percentage of the SBIR awards include work that derived from universities or also includes them as a subcontractor. Both programmes are highly competitive and designed to encourage domestic small businesses to engage in federal R&D. The programmes allow small businesses to explore their technological potential and provides the incentive to profit from its commercialisation. By including qualified small businesses in the nation's R&D arena, high-tech innovation is stimulated and the United States gains entrepreneurial spirit as it meets its specific research and development needs.

I believe both programmes are great tools to help commercialise university research and I am trying to work with universities to focus more on getting their postdocs that are not going to stay in the educational system to submit proposals because that is the best way to transition university paid research.

Can you outline the application process?
The Program is run out of 11 different agencies and each one has legislation and rules on how they allow applicants to come in. If I had a magic wand and could go back and do this again, we would have a different way to contract with small businesses than we do with the universities and large businesses. It is a cumbersome process that is not designed to be friendly to new applicants and requires extensive documentation. The application process is one of our Achilles' heels. As a government, we build up these large systems that are aimed at reducing fraud and are catered towards large business and universities who submit many proposals. If you are just submitting once or twice, these systems are difficult because the learning curve to get up to speed on them is substantial.

Can you talk a bit about the Federal and State Technology Partnership (FAST) Program?
The concept with FAST was to fund the

John R. Williams, Director of Innovation and Technology (SES) at US Small Business Administration.

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local entrepreneurial ecosystems that could then build a network within their state; they would be there to assist people, especially first-timers, to write, submit and win SBIR awards. It was particularly aimed at under-represented states. The reason certain states do not have a lot of small high-tech firms is because the whole ecosystem

around what is required does not fully exist. We also work with accelerators in underrepresented communities with the expertise in technology fields to help young entrepreneurs, many whom have graduated from local schools that then stay in that area. This is part of our growth accelerator fund competition where we give $50,000

to an entity that is already an accelerator or incubator that is looking to incorporate an accelerating platform to help start-ups and/or small businesses scale and grow fast.

What is the significance of the SBIR Program as America's largest seed fund and how are these investments critical to American priorities to build up a strong national economy?
The SBIR Program has started major companies and created new technology areas. Companies like Qualcomm, Symantec, Illumina, MedImmune and technologies like LASIK surgery, and 3D printing received their earliest funding from the SBIR Program.

Firms that SBIR/STTR seeks to invest in are tackling issues in environmental security, artificial intelligence, national security, public health, cybersecurity, advanced robotics, space exploration, clean energy, and agro-tech, among many others. Many of these firms have been founded by technical inventors yearning to capitalise on their creations and unleash the true potential of their inventiveness for the benefit of the global community.

Some of the things that make SBIR work well are things that the private investment community is weak on; we will work with earlier stage technologies and take higher risks because as the government, we are not looking for a payback. We can do things without a market-driven need. Venture and angel investors love apps and similar technology but we do not fund anything like that. We are into materials, medical devices and software that address bigger issues and many of our companies do not need follow-on funding. They are not interested in winning huge investments and then selling a company in five years. They want to build a company that has a high amount of technical people working for good salaries. They might be a company of 1-400 people, and that is a very, very important part of the US economy.

Why is the SBIR Tibbetts Award necessary?
The Tibbets Award is the only recognition programme we have for SBIR and we have recently added the Hall of Fame award. The SBIR Program is well loved by Congress because it generates jobs and spends money across all the states but it's always important to show research that has transitioned. When you can show the successes, and how that company

started on SBIR, it is important that it is documented and then promoted. That is what Tibbetts is about. It is to say, 'we have started a lot of companies that would not have started without our investments'. An interesting example is, Illumina, the business we just awarded the Hall of Fame to.

Why was the SBIR Road Tour created and how important is it as a national outreach effort to convey funding opportunity?
There are states that are not getting as many as awards as well as women and other minorities that are under-represented. We came up with the idea to put 20 project managers on a bus and visit five states over a week and we do that three times in the year. The original vision was really to address Congress' concerns about having boots on the ground in under-represented states but the benefit to the Program managers has been huge as well (learning from each other, on the road) and we have met with thousands of entrepreneurs.

How important is it to have the big federal agencies as a part of the Program and do these agencies also have specific needs in mind when they solicit research?
It is important to have the big agencies involved because they have very large R&D budgets and this Program operates as a tax on the R&D dollars they contract out. About 45% of the US $2.5 billion a year comes from the Department of Defence and over 30% from the National Institute of Health (NIH), so it's critical they are part of the Program. But another key reason why it is critical to have all the agencies manage their own programmes and be involved is that these agencies have some of the best scientists in our country and these scientists and engineers are the ones that select the firms to be funded and they know where the long-term gaps in technology development roadmaps are. It's also important in instances like the DOD for example, where their big defence contractor is not motivated to come up with a new material for their engine blades if they just spent $100 million on a manufacturing facility for an existing material but the engineers at the DOD may ask an SBIR firm to come up with better material options. The SBIR is a great way to get innovation in areas that technology is advancing in, but you cannot motivate your existing contractor to do work on.

What are the latest updates or improvements for the SBIR and what does

the future hold?
In terms of improvement, we would like to streamline the application process. Unfortunately, these are issues that must be changed in legislation. Another weakness of the Program is the lack of attention paid by scientists to the market side of investment; we would like to have to legislatively require that more money goes towards addressing how you are going to commercialise the technology you have and not all have to go just towards the advancement of the science. We want to provide more assistance that addresses this side as well as understanding the market and what it takes to successfully commercialise a technology, is a common weakness for both the small business and the federal manager.

We talked previously about trying to get more engagement from universities and postdocs. I think there is a fantastic partnership that can be had there. SBIR is a great first source of money. We are also always getting new companies but also have firms that have participated in the Program for over 20 years and the issue comes up of how long a company should be in the SBIR Program. We are looking at how you ensure that if you are repeatedly funding a company, they still commercialise. Finally, we are conducting more data analysis; gathering more data on companies, but at the same time not putting any more burden on the small companies. Then we can do better analysis of what that data means; how we can create policies that can attract certain companies, female owned and driven companies, for example.

• *For more information about the work involved in the SBIR Program as well as the SBA itself, please their websites at https://www.sbir.gov/ and https://www.sba.gov/ respectively.*

Contact

E: technology@sba.gov
W: https://www.sba.gov/
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