

# REAUTHORIZATION OF SBA'S SMALL BUSINESS INVESTMENT COMPANY PROGRAM

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## HEARING BEFORE THE COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP OF THE UNITED STATES SENATE ONE HUNDRED SIXTEENTH CONGRESS FIRST SESSION

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JUNE 26, 2019

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COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP  
ONE HUNDRED SIXTEENTH CONGRESS

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## **REAUTHORIZATION OF SBA'S SMALL BUSINESS INVESTMENT COMPANY PROGRAM**

**WEDNESDAY, JUNE 26, 2019**

UNITED STATES SENATE,  
COMMITTEE ON SMALL BUSINESS  
AND ENTREPRENEURSHIP,  
*Washington, DC.*

The Committee met, pursuant to notice, at 3:17 p.m., in Room 428A, Russell Senate Office Building, Hon. Marco Rubio, Chairman of the Committee, presiding.

Present: Senators Rubio, Ernst, Young, Kennedy, Romney, Hawley, Cardin, Cantwell, Shaheen, Coons, and Duckworth.

### **OPENING STATEMENT OF HON. MARCO RUBIO, CHAIRMAN, A U.S. SENATOR FROM FLORIDA**

Chairman RUBIO. Today's hearing of the Senate Committee on Business and Entrepreneurship will come to order. I apologize. We are in the grips of a terrible plot against the Senate Small Business Committee. They keep scheduling like 18 votes at the same time as our meeting. I think we are going to change our name. But anyway, so the members will be coming in and out. I do not know what the—no one can tell us exactly what the future holds, but they will keep us up-to-date here on it. And Senator Cardin will be in in a minute.

I am going to abbreviate my opening statement in the interest of time so we can get through this and not delay it any further.

Today we are going to be having a pretty good conversation about the SBIC program, which is one of the earliest SBA programs. The impetus was a Federal Reserve Report that showed significant gaps in the business credit and equity markets, with the most prominent gap being found in the small business sector. And the report recommended the SBA to create a program to provide equity financing to small businesses. This resulted in the SBIC program that, in turn, popularized the venture capital model of investment in the 1960s and 1970s. And since then, the program has continued to provide venture capital financing to fill the gap in investment in small business by the private sector.

The impact of the program is immense. In 2017, the Library of Congress prepared a report that measured the role of the program in small business job creation. It only covered the timeframe between October 1995 and December 2014, but found that the program created almost 3 million jobs during this period, which is one

new job created for every \$14,000 in SBIC investment. It also looked at administrative costs, and found the average administrative cost was approximately \$35 per job created. So it is a clear example of the type of public-private partnership that fills a gap in the private marketplace and creates quantifiable results.

It is a proven program that has historically met investment needs not being met by the private sector, and so it is prudent to reassess the state of investment in the United States, identify gaps in financing, and evaluate the opportunities that exist for this program to fill those gaps under current example.

For example, there are meaningful market failures in the current configuration of the American innovation and advanced manufacturing ecosystem. The United States is beginning now the difficult work of confronting Chinese industrial policy, which has a clear goal of dominating the most important industries of the century, through government support, credits, access to guaranteed market share in their own large, domestic market. And so it is prudent for us to consider how we align public policy to address these market failures in the light of this direct national competition.

The access to capital challenge that is facing innovative American firms with high-growth potential is damaging our country's competitiveness, and the financing gap is not being filled by private investment. Today, venture capital funding in the U.S. is highly concentrated by geography, primarily in areas like San Francisco, New York, and Boston, and by industry, largely to information and communication technology companies.

The relatively short window for expected returns, combined with the prioritization of highly scalable, capital-light businesses for investment, skews funding toward digital technology and skews it away from capital-intensive manufacturing sectors with longer profit horizons. So creating an environment in which U.S. firms can compete globally, while creating jobs in the United States, is in our vital interest, because if the policy fails to address it, the United States will continue to lose to other nations, both in our capacity to produce now and our capacity to innovate in the future.

These small advanced manufacturing firms, in particular, face a debilitating lack of access to critical finance in the U.S. Innovative firms engaged in complex, advanced manufacturing production require larger amounts of capital and they also require more time than non-production firms. While these kinds of firms can often find financing for the earlier stages of their development, they face difficulty accessing financing when they reach the larger-scale production and commercialization stage. Since innovation and production are so closely interwoven in advanced manufacturing, losing the ability to engage in advanced manufacturing production is prohibitive to the ability to innovate and conduct high-level research and development.

So the SBIC program is uniquely positioned to play a role in filling this gap in financing and to leverage private domestic investment. After all, one of its tenets is to support industries that will undergird our national competitiveness.

Our discussion today will explore the role of the SBIC program, the role it can play in this national discussion, as well as further

expand upon its history, stability, and success. I look forward to discussing this with everyone.

Are you ready?

Senator CARDIN. I am ready.

Chairman RUBIO. All right. I will turn it over to the Ranking Member.

**OPENING STATEMENT OF HON. BENJAMIN L. CARDIN,  
A U.S. SENATOR FROM MARYLAND**

Senator CARDIN. First, let me apologize for the lateness of starting this. As I am sure the Chairman has explained, we have been in a series of votes on the floor of the Senate, and there has been some discussion as to how we are going to proceed later today. I was involved in some of those discussions so I apologize for being a little bit late.

I want to welcome all of our witnesses. This is our seventh hearing in regard to the reauthorization of the programs under the Small Business Administration.

I think we all understand that the building block needed to start and grow business is capital, so today's hearing is particularly important. It was in 1958 that the Small Business Investment Act was passed by Congress, which recognized the realities that for small business it is very difficult to find investment dollars.

Since then, the SBIC program has invested more than \$97 billion in 10,000 small businesses, including many well-known companies like Intel, Apple, and FedEx. Last year alone, SBIC facilitated more than \$5.5 billion in investment to more than 1,100 high-growth companies across the country, at zero cost to the American taxpayers. This funding is vital because traditional venture capital is overwhelmingly concentrated in urban centers in New York, Massachusetts, and California, with less than 1 percent of all venture capital going to businesses in rural communities.

The lack of diversity is not just geographical. Around 2 percent of venture capital goes to women-owned businesses, and only 1 percent goes to black- and Hispanic-owned businesses. That is not acceptable.

There are businesses in every community throughout America that could achieve growth if only they had the capital, and that is why we need the SBIC program.

Consider, for example, Zentech Manufacturing, a Baltimore company that designs and builds high-tech circuit boards, cables, and other parts for companies in the defense and medical technology industries. When Zentech needed capital to prevent a takeover that would have shut down the company in Maryland and shipped dozens of jobs overseas, an SBIC fund was the only entity that could provide the type of capital Zentech needed.

Since then, the company has increased its workforce by more than 60 percent and has successfully competed against overseas companies for contracts, reassuring manufacturing jobs here in the United States. These are well-paid jobs that are lifting families into the middle class.

The simple truth is that traditional venture capital industry is doing an inadequate job of directing capital to communities most

in need, and companies like Zentech are missing out on the opportunities for growth and job creation as a result.

The SBIC program fills a very wide gap in traditional venture capital markets. But more importantly, SBIC is a good investment for the taxpayers. According to the 2017 Library of Congress report, SBIC creates one job for every \$35 spent administering the program, and SBIC investments support minority- and women-owned businesses more than twice as often as traditional venture capital. That is not enough, but at least it is better.

While SBIC does is a better job of reaching underserved communities, we still have to do a lot more. Our focus today must be on how we can take the SBIC program from a good program to a great program, a more inclusive program that reaches underserved communities frozen out of the traditional venture capital markets.

We can begin by exploring how to build a pipeline of diverse investors into the SBIC program, because we know that racially and gender-diverse SBIC funds investment more frequently in minority- and women-owned businesses. We also need common-sense reforms to make the SBIC program more attractive to investors and more efficient for those who run SBIC funds, especially expediting the licensing process.

These are some steps that will significantly improve the SBIC program as well as create jobs and value in communities nationwide. So I am looking forward to the discussion we have today, how we can improve the SBIC program, and the role that this Committee can play in facilitating those changes.

Chairman RUBIO. Thank you. Our first panel is one witness. Joseph Shepard is the Associate Administrator of the Office of Investment and Innovation at the Small Business Administration. He held the same position in the Administration of former President George W. Bush.

Mr. Shepard, thank you for being here. We will begin with your testimony, and again, our apologies.

**STATEMENT OF JOSEPH SHEPARD, ASSOCIATE ADMINISTRATOR, OFFICE OF INVESTMENT AND INNOVATION, U.S. SMALL BUSINESS ADMINISTRATION, WASHINGTON, DC**

Mr. SHEPARD. Good. Good. Thank you, both, Chairman Rubio, thank you, and Ranking Member Cardin, thank you as well, and members of the Committee who will join us later, I am sure. I appreciate the opportunity to be here before you and discuss the reauthorization of SBA's Small Business Investment Company, or SBIC, program.

I have spent a great deal of my private equity career in and around the SBIC program. In addition to having worked for an SBIC, several of my mentors were trained in SBICs, and from them I learned much of my on-the-job training and due diligence, financial analysis, investment structure, and transaction processing.

Prior to assuming my current position at SBA on March 22, 2017, the SBIC program's capital-at-risk increased 1.8 times from \$7.9 billion as of September 30, 2010, to \$14.2 billion as of December 31, 2016. During this time, the SBA did not keep pace with this

growth in areas such as technology, examinations, risk, SBIC program costs, and personnel.

During my time at SBA, I have worked with the SBA team to identify challenges faced by the SBIC program, and together we have been endeavoring to modernize the program and make improvements. During this time, I have enjoyed the support and leadership of former administrator Linda McMahon, and I greatly appreciate the hard work of the SBIC program team and all my colleagues at the SBA.

Following is a brief summary of the select improvements that we have made within the SBIC program.

There have been no major technology improvements to the SBIC program since 1994. Since my arrival at SBA, it has been a priority of mine to modernize the SBIC program's information technology infrastructure. During the past two years, we have transitioned the legacy SBIC Web data collection system to SBA's Office of the Chief Information Officer, conducted an extensive review of the SBIC program's existing technology, procured a new software platform, and this year began the configuration of the new software. The implementation of this new software platform will allow the SBA to improve the information associated with the SBIC program and dramatically improve the SBA's data security, risk management and oversight capabilities.

Prior to my arrival, challenges associated with the SBIC examinations were present, as a result of issues and practices prior to fiscal year 2017. A 2013 SBA Inspector General report had also identified deficiencies in the management of the SBIC examination process.

Statute requires that SBICs be examined at least every two years. SBA began fiscal year 2017 with an estimated 56.9 percent of SBICs in statutory compliance. In fiscal year 2017, I recommended and then implemented an examination surge. Today, statutory compliance has improved dramatically and is now at 100 percent.

Additionally, to better mitigate current and future credit risk in the SBIC program, the SBA enhanced its credit standard to require that all SBICs with SBA guaranteed leverage be examined within an 18-month time period.

In fiscal year 2018, I initiated the creation of a new econometric subsidy model to replace the SBA's 27-year-old model. The result is an improved subsidy model that is reflective of the inherent risks associated with present-day private equity investing, and we believe will more accurately project future losses and long-term costs of the current SBIC program to taxpayers.

The SBIC program also has a total operating cost each year that is not covered by subsidy. SBA's total cost to operate the SBIC program during fiscal year 2018 was \$27.3 million. Since my arrival we have focused on ways to reduce taxpayer costs associated with SBIC program expenses.

In 2017, SBA increased licensing fees paid by SBIC applicants and examination fees paid by operating SBICs. Both fees had not been increased since 1996.

Finally, the SBIC program's workforce needs to evolve. Approximately 31 percent of the program's current position descriptions

are 15 years or older, and 41 percent are 7 to 13-years-old. The oldest position description is 22 years old and was last revised in 1997. A contractor has been engaged to assist us in revising all outdated position descriptions. SBA will continue to hire additional staff and fill current future vacancies. New positions are also being created and filled, including an IT project manager, IT data scientist, senior examiner, senior risk and investment policy officer, and an investment accounting and analytics officer. I am committed to hiring for an organization that can support the program of the future.

In conclusion, actions taken over the last two years have improved the SBIC program. Many of these changes and improvements are generational in nature with no previous such improvements occurring since the 1990s or for the past 20 years. As a result, the SBIC program is in a better position today to face the challenges of the future.

Thank you.

[The prepared statement of Mr. Shepard follows:]





**Statement of Joseph Shepard  
Associate Administrator  
Office of Investment and Innovation  
U.S. Small Business Administration**

**before the  
Senate Committee on Small Business and Entrepreneurship**

**Hearing on “Reauthorization of SBA’s Small Business Investment  
Company Program”**

**June 26, 2019**



**Statement of Joseph Shepard  
Associate Administrator  
U.S. Small Business Administration**

Chairman Rubio, Ranking Member Cardin, and members of the committee, thank you for the opportunity to discuss the reauthorization of SBA's Small Business Investment Company (SBIC) program and the state of the SBIC program.

I am the United States Small Business Administration (SBA) Associate Administrator for the Office of Investment and Innovation (OII), which oversees the SBIC program. Prior to the SBA, my business career has included leadership positions in consulting, investment banking, venture capital, private equity, and investment fund management for such organizations as KPMG, Texas Pacific Capital, Principal Financial Securities, Banc One Capital Markets, as well as a previous tenure in public service at the SBA.

Upon my arrival, I completed an initial assessment of the overall operating environment within the SBIC program and began identifying areas for modernization and improvement – including technology, examination processes and risk management, and personnel. We owe it to the American taxpayer to manage program risk and provide appropriate oversight.

During my time at SBA, I have worked with the SBA team to identify challenges faced by the SBIC program and together we have endeavored to make improvements. During this time, I have enjoyed the support and leadership of former Administrator Linda McMahon and I greatly appreciate the hard work of our team and my colleagues at SBA. Following is a summary of select improvements made within the SBIC program.

*Technology – Improving SBA's Information*

Technology plays a key role in improving effectiveness and efficiency. During my tenure, I've focused on opportunities to leverage technological improvements to modernize the SBIC program's information technology infrastructure to streamline processes, increase security, and facilitate information sharing throughout the SBIC life cycle.

To manage the SBIC program effectively, SBA needs to move its software and tools into the 21st century. My first action in FY 2017 was to seek collaboration with SBA's Office of the Chief Information Officer (OCIO) to assist in replacing SBA's legacy systems associated with the SBIC program. Our first action was to transition the legacy SBIC web system to the OCIO. For the remainder of FY 2017, we conducted an extensive review of the SBIC program's existing technology and legacy systems. In FY 2018, we then procured a new off-the-shelf cloud-based Software as a Service (SaaS) software platform to assist with modernizing the SBIC program. In FY 2019, the SBA began the configuration of the software platform to provide fully modernized oversight and risk management tools in OII to utilize in connection with all aspects of the SBIC program. The single platform will be used to manage the entire life cycle of an SBIC, from the initial inquiry regarding a potential SBA license, the licensing application process, operations oversight during the 10+ year period of an SBIC's life cycle, coordination of regulatory examinations, and finally, the wind-up or

liquidation of SBICs. The solution has been deployed in SBA's cloud environment, which will ensure the solution complies with the Federal Risk and Management Program requirement. Furthermore, consolidating the data from different workflows into a single structured data warehouse increases data integrity and information asset protection.

The introduction of this new software will allow the SBA to improve the information associated with the SBIC program and dramatically enhance SBA's data security, risk management, and oversight capabilities.

#### *Examinations – Improving SBA's Oversight*

In September 2013, the Office of the Inspector General issued its Audit Report 13-22, "Improved Examination Quality Can Strengthen SBA's Oversight of Small Business Investment Companies." The report identified deficiencies in the management of the SBIC examination process after it sought to determine the extent to which the SBA: (i) conducted SBIC examinations in accordance with the law, rules and regulations, and SBA policies and procedures; (ii) used SBIC examinations to mitigate the risk of financial loss; and (iii) managed the SBIC examination process effectively and efficiently.

The Small Business Act requires that SBICs be examined at least every two years. SBA began FY 2017 with 178 of all 313 SBICs (56.9%) in statutory compliance. In FY 2017, I implemented an immediate response to the problem through an intense focus on examinations. I'm pleased to announce statutory compliance improved dramatically and is now at 100%.

Additionally, to better mitigate current and future credit risk in the SBIC program, the SBA enhanced its credit standard to require examinations within an 18 month time period for all SBICs with SBA-guaranteed leverage. By the end of FY 2018, SBA credit standard compliance improved to 69.3%.

In FY 2018, I commissioned an evaluation to determine how the SBIC examination process can be streamlined, the potential role of technology in streamlining this process, and whether the program's current organizational structure optimally supports the examination process. SBA will review the forthcoming evaluation results and will begin implementing processes to enhance SBA's oversight capabilities.

#### *Risk – Improving SBA's Subsidy Model*

During the post-recession period from FY 2010 to FY 2018, the SBIC program experienced charge-offs for debentures totaling \$281.098 million, and for participating securities totaling \$1.384 billion. To account for annual cash in-flows and out-flows associated with charge-offs and determine fees needed to operate the program, SBA has used an historic-averages subsidy model for the past 27 years.

In an effort to improve the model used to calculate the cost for the SBIC program, I initiated the creation of a new econometric model to enhance forecasting of future performance and

losses associated with the SBIC program. The new model, created in collaboration with OCFO and OII, still considers past loan performance, but now and into the future incorporates assumptions associated with macro-economic factors, private equity elements, and private equity fund characteristics. The result is an improved model that is reflective of the inherent risk associated with present day private equity investing and we believe will more accurately project future losses and long-term costs of the current SBIC program to taxpayers. Importantly, the econometric model can more easily be revised in future years as changing conditions warrant reexamining model assumptions. The new and improved SBA subsidy model will be implemented beginning in fiscal year 2020.

#### *SBIC Program Costs – Improving SBA's Fee Collection*

The SBIC program has a total operating cost each year that is not covered by subsidy. The program's costs consist of direct costs from the operating budget, including contracts; compensation and benefits; agency-wide costs, such as rent and telecommunications; and indirect costs. SBA's total cost to operate the SBIC program during FY 2018 was \$27.337 million. The only fees currently collected by the SBIC program to reduce the amount are licensing and examination fees. In FY 2018, these fees totaled \$1.692 million.

Since my arrival, I've focused on ways to reduce taxpayer costs associated with these SBIC program expenses. In 2017, SBA increased licensing fees paid by SBIC applicants and examination fees paid by operating SBICs. In FY 2018, SBA began collecting the increased fees, which will increase gradually until FY 2020.

#### *Personnel – Improving SBA's Workforce*

SBA will continue to hire additional staff to fill current and future vacancies. New positions are also being created and filled, including an IT Project Manager, IT Data Scientist, Senior Examiner, Senior Risk and Investment Policy Officer, and an Investment Accounting and Analytics Officer. I'm committed to hiring for an organization that can support the program of the future.

#### *Conclusion*

Actions taken over the last two years have improved the SBIC program. As a result, the SBIC program is in a better position today to face the challenges of the future. SBA will continue to address challenges and make improvements in the SBIC program.

Chairman RUBIO. Thank you. Mr. Shepard, I want to begin my questions by—I want to read you the statement of policy of the Small Business Investment Act. It is the law that created this. In creating this program, this is what Congress stated as its intent.

Here is a quote: “Stimulate and supplement the flow of private equity capital and long-term loan funds which small business concerns need for the sound financing of their business operations and for their growth, expansion, and modernization, and which are not available in adequate supply.” End quote. That is the stated intent.

It seems to me that Congress made clear when they passed it, and it is reiterated in many reforms to the law, that the intent of the SBIC program is to provide patient capital to small businesses that private financial markets do not otherwise provide.

So let me ask, do you agree with Congress’ enacted law and stated intent—

Mr. SHEPARD. Oh, absolutely.

Chairman RUBIO [continuing]. The goal of the—well, do you agree that the intent—let me just ask it this way. Do you agree that the law and the stated intent is to supplement the private market by increasing the flow of long-term funds to small businesses?

Mr. SHEPARD. Yes.

Chairman RUBIO. Okay. Because in your testimony you implied that risk has increased in recent years, or at least has been undervalued, making necessary and update of the subsidy model SBA uses for the SBIC program. So, for example, you say that from fiscal year 2010 to 2018, the program experienced charge-offs where SBA expenditures on loans have defaulted, of \$281 million for the debenture program.

As you are aware, charge-off costs are not the only payment factor in the program. The SBA can recover assets on loans that have defaulted. They can charge fees on operating loans to cover costs.

Is it not it true that during the same period the SBIC debenture program operated on a zero-subsidy basis?

Mr. SHEPARD. That is correct, yes.

Chairman RUBIO. And is it also true that during this period the fees the SBA charges on the debenture SBIC program has been lower than the historical average?

Mr. SHEPARD. Yes, absolutely. That is correct.

Chairman RUBIO. So you say in your testimony that upon your initiative, the SBA will begin to use a new econometric model to calculate its costs, that the model will include new assumptions like macroeconomic factors, private equity elements, private equity fund characteristics.

You answered the first question agreeing, right, that the purpose of this is to provide funding that private market was not meeting. One of the purposes of the SBIC program is to fix that market failure, to increase the long-term patient capital that goes into small businesses, which would not be made available without the program.

It is true, I think you would agree, that part of achieving this purpose is investing in small businesses that are themselves investing in innovations and new products which are, by definition,

more uncertain investments than what the private market writ large has to offer.

Mr. SHEPARD. Right.

Chairman RUBIO. So will the assumptions you have added to the historical model SBA has used, will it increase or decrease the time horizon of capital financing for these small businesses?

Mr. SHEPARD. Yes. Thank you for—good question, Chairman. I thank you for the question. The intent of the subsidy model, that will not impact the disbursement of capital. The intent there, and with a lot of the things that I mentioned in the opening comment, were generational, things that have not been fixed, getting the program ready for the future, getting it ready for whatever may come.

We looked at the subsidy model and we looked at how the portfolio was constructed, currently about \$15 billion, and its move into more equity-oriented investments. When the model was built it was more debt-oriented, so I wanted to make sure—and we, as a team, wanted to make sure that we were accounting for future losses, and let's have a better model in place so as to stewards the taxpayer dollars we do not experience loss in the future. That was the intent.

Chairman RUBIO. You agree the metrics, the private financial markets are used, are more short-term, or sorry. I guess, let me ask you, are the metrics the private market uses more short-term or long-term in their views than the current SBA model?

Mr. SHEPARD. I think they are similar. I think a lot of the investing activity that takes place in the SBIC model, the majority of it is subordinated debt of mezzanine, and it has got, you know, a maybe 3-, 5-, 7-year time horizon, very similar to the private sector. So I do not feel like there is a disconnect there, by any means.

Chairman RUBIO. Well, and which private equity elements will be used in assessing the default risk of—say there is a company that is developing a new cancer drug or a telecommunications equipment that can compete with Huawei. And would private equity elements investment in small business taking on these challenges without an SBIC program?

Mr. SHEPARD. Well, to the subsidy model, we will be working with OMB. The implementation will occur in 2021. We are reviewing those right now, in terms of what those will be. They will be more macroeconomic in terms of trying to anticipate macroeconomic factors in our economy. And so it will be less oriented toward specific industries and more oriented toward the economy as a whole.

Chairman RUBIO. Well, I guess my last question—and I am going to turn it over to the Ranking Member—in developing the model, have you considered the shortfalls of equity valuation methods like the capital asset pricing model or others that are commonly used in the private markets, and undervaluing the development of long-term innovative product?

As an example, which investment would capital asset pricing model more highly value, buying a share in an index fund in the S&P 500 or taking an equity stake in a company that, for example, is making new agricultural machinery to pick crops like strawberries in Florida that have been done manually? So do you take

into account, in the model, the well-established shortfalls of this valuation method?

Mr. SHEPARD. Yes. We are going to need to do that, without question.

Chairman RUBIO. Thank you. Ranking Member.

Senator CARDIN. Mr. Chairman, thank you very much for being here and for your service. You heard in my opening statement the concern I raised about opportunities in the traditional venture capital markets for women-owned businesses and minority businesses. And then I cited the SBIC numbers, which are twice as strong but still, I hope we all would agree, unacceptable.

So what are your recommendations for how we can have a more diverse use of the SBIC funds and use it to help particularly women- and minority-owned businesses?

Mr. SHEPARD. Right. Well, you know, I publicly stated before that, as the Chairman read, looking for areas in the intent and the mission of the SBIC program, to look for areas where there is not an adequate supply of capital, and certainly women, veterans, minorities, rural areas hit all of those areas. And I would say, as you look at our numbers, and as we have talked in the past, they are anemic in the impact that the program has had in a lot of those areas. Much room for improvement.

And so I could not agree more that there is more that we should do and need to do. I will note that SBA invests and backs the capital that goes to the SBIC, and the SBIC investment managers are the ones who make those investments.

Senator CARDIN. I understand that completely. So how do we get—and that is why I said I think the key is to get more SBIC investors that are diverse, that represent diverse communities, including rural communities. How do we go about doing that?

Mr. SHEPARD. I think what we have got to do is we have got to back up and look at the licensing phase, and make determinations about what kind of SBICs are going to be licensed and what plan are they going to put before the SBA, in terms of where their focus is going to be. Are you going to focus in women and minority areas? Are you going to focus in rural areas? And we have got to make the determinations there and then keep them on plan once they get into the marketplace, if they successfully get an SBA license.

And I would look forward to working with your team to talk about—and the Committee—to talk about how can we do that? How can we do that inside the SBA to make that happen?

Senator CARDIN. So for entrepreneur development we have special programs to try to help our veterans, to help women. Do we need a similar program for the SBIC?

Mr. SHEPARD. I think we could certainly do it within the current framework, but again, it begins in how do we license and who are we licensing to?

Senator CARDIN. So let me get to the licensing issue here, because I know that Chairman Risch, when he was Chairman of the Committee, held a hearing that dealt with the concerns about the length of time on the licensures, the complications. We have been told a lot of potential licensees decide not to go through the process because they think it just takes too long, and that, at least the information that we have, it is getting worse rather than better, as

far as the process itself for licensure. The numbers of SBIC licenses that have been granted has gone down.

So how do you streamline the license process to encourage more investors but also do it in a way that recruits in underserved communities?

Mr. SHEPARD. Right. Well, the technology improvements that I have talked about are certainly going to help. We are hopeful, by the end of the summer—by the end of the fiscal year we will have implemented what we are calling the licensing tracker. So that should help us streamline and make our process more efficient. So that is one way, from a technology standpoint.

When we have more startup, first-time small business investment companies, and we have seen an uptick in those, it does take a little longer to vet those. In the private sector it take anywhere from a year to two years. We are nowhere near that timeframe. We do a much better job. But there is always room for improvement. And so do we add more people? I am taking care of the technology standpoint. So that speaks to process and improving the process and having a better process in place.

In terms of how do we get participants that are going to invest in some of these areas you have mentioned, we are going to have to do that by encouraging those people to come in, and again, are there ways to do that? Do we do that through regulation? Do we do that through statute? I think those are conversations that we need to have about the best way to impact the few, if you will, to impact those applicants that are coming in to invest in those types of small businesses.

So let me ask you one last question dealing with early stage investments, because that would also target more to underserved communities if we had early stage investment. The program we did start was terminated, I believe for the reason that it was claimed not to be cost-effective. Does this need still exist, and how do we make it cost-effective?

Mr. SHEPARD. Well, that was one of the reasons. There also was not a high degree of interest. A lot of it was the way the current program is built, is the majority of the funds that come in are subordinated debt or mezzanine. They are investing in operating companies that have existing cash flows that can service that debt that they are borrowing through the SBA guarantee. And so they are not early stage or seed companies.

And so that is what you are seeing in the portfolio right now, if you will. That is what you are seeing in the SBIC.

Senator CARDIN. But would not early stage investment have a tendency to reach more of the underserved areas that are more women, more minorities, more rural?

Mr. SHEPARD. Certainly startups and certainly early stage, and one other thing is we do have unleveraged small business investment companies. The majority of those do invest in early stage. They are welcome to come into the program at any time, because it is not a credit risk to the government. It is not a credit risk to the SBA. So they do come in to get the license, and many of them do invest in that area.

Senator CARDIN. Thank you, Mr. Chairman.  
Chairman RUBIO. Senator Romney.



Senator ROMNEY. Thank you, Mr. Chairman and Ranking Member. I appreciate the focus on this Committee on building our economy and providing opportunities for all our citizens.

I am interested in understanding just where it is in the entire spectrum of investment that this investment activity that you carry out is playing a meaningful role. I do recognize that there is an underrepresentation in the private equity and venture capital world in businesses that are led by or founded by minorities and women. Having worked in that industry for some time, I would note that in my own experience very few of the people that came to us with proposals were minorities or women, although we did invest in a number. Meg Whitman at FTD, Judy George at Domain, and Linda Mason at Bright Horizons. And like most, some were successful and some were not.

I do know that in the industry there is more money chasing deals than there are good deals, and my experience is that, well, at least from firms I knew, we would have invested in a Martian if we thought we could make money at it. So it was not that we were afraid of investing with a particular type of American. We just wanted the best deal we could possibly find that made a bunch of money for our investors, and, ultimately, for ourselves.

Given the fact that there is so much money in private equity today, billions upon billions, and so much money in venture capital, with SoftBank and others that are just flooding the market, where are the gaps where the private market is not reaching, that this investment activity on the part of the SBA is reaching?

Why do you exist, if you will, in this investment activity as opposed to just turning to the private market? Where are the gaps? Where are the places that you feel you need to play a role? Is it with regards to minority opportunities? Is it with regards to investing in things that have social values that may not have the high enough return to justify a standard venture capital investors? Is it a certain region of the country? Are you playing a redundant role that can be filled by the private sector, or are there really areas that you are filling that would not be filled otherwise?

Mr. SHEPARD. Yes. Senator Romney, thank you for your question. I will say that the small business investment companies are certainly internal-rate-of-return driven. They are trying to return to their limited partners a certain return that has been promised to them, and then return the capital back to the SBA, that has been borrowed from the SBA. So their incentive is often return-based as opposed to based on investing in certain types of businesses. It maybe women-, minority-, veteran-owned, or geographic as well, in terms of rural investing. We would need to make some modifications to the program to incentivize that investment activity, otherwise, than its current state.

In terms of gaps, we need more information, and I am working on getting a study together, hopefully beginning early in 2020, that will specifically address that issue, because we have a concern about it as well, and where in the marketplace is the need? I will tell you that in 1999, the program size was about \$3 billion. It is now close to \$15 billion. But there is a component of that portfolio that are business development companies, for example. They are now at about \$3 billion. It is a pretty large concentration of the

portfolio. It is between 20 and 25 percent. And the majority of those publicly traded companies do provide unitranche debt, which is also senior debt.

And so there are certainly places where you can look at the portfolio and you can look at the activity and you can see competition with the free enterprise system. And the intent, of course, is to provide capital in those areas where there is not an adequate supply and not be competitive.

And so not a great answer, because there are some unknowns, and we need to have some more information to define that better.

Senator ROMNEY. I would just note that I would think, in traditional venture capital and private equity, that there really is not a need for the government to participate and to, if you will, juice or leverage the returns that are available to private investors and private funds, that the reason for this activity potentially being supported by Congress and by our government and taxpayers is if it is focused on addressing a particular area where the need is not being met, where the private market is not reaching.

And if the private market is effectively reaching every area then there is no particular reason for the taxpayer to subsidize returns to private equity and venture capital funds. And even then, even if there are gaps, one would have to ask, are we better trying to find ways to get the people that live in those gaps, or the individuals that are affected by those gap areas, to have better access to the private markets, or should government step in?

So these are, I think, real questions that I hope we will be able to answer.

Mr. SHEPARD. Right. And one other thing I will add, we are certainly, as you have mentioned, at an all-time high, in terms of private equity, close to \$3 trillion, and maybe have surpassed that, private equity-based in the United States. And we have seen a decline in licensing activity because there is such an opportunity to raise capital in the private markets with LPs there, and I think that is part of the reason we have seen a steady decline of fewer SBICs, because they have been able to access that capital a different way.

Senator ROMNEY. Thank you, Mr. Chairman.

Chairman RUBIO. Senator Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman, and thank you again for introducing legislation that is topical today to fix this problem as it relates to women-owned businesses being penalized if they actually have equity investment from being able to participate in the SBA program. So I am assuming that you agree that that is a good solution to fixing that problem.

Mr. SHEPARD. I am not sure what.

Senator CANTWELL. So currently if you are a woman-owned business and you receive equity investment, they are saying that that counts against your minority ownership. Look, we have a major problem in America that women are underrepresented in our economy, and there are lots of reasons for that, but we need to work a lot harder on this Committee to make sure that access to capital, technical and skilled training, barriers that are inhibitors to that, we change the law to allow women-owned businesses to be sole-source, contract-approved at the Federal level. For the first time,

Federal Government made their threshold numbers. So capital importance of opportunity, the Women's Centers, all these things are important to bringing up that number, which is a very low number.

Frankly, my colleague, Senator Shaheen, and I, we like women as women-owned businesses because chances are they create products that we like and they are more geared toward the things that we are interested in.

But the bottom line is we need half of our economy to be more entrepreneurial, and to do that they have to have access to capital and changing this law so they are not penalized. That was my question. Do you believe that we should continue to help women-owned businesses not be penalized under the Federal law?

Mr. SHEPARD. Absolutely. That should not be a barrier to entry in our economy, by any means.

Senator CANTWELL. And you support the Women Business Centers?

Mr. SHEPARD. Absolutely. They are a great product and one of the good things we have at SBA.

Senator CANTWELL. And do you agree that they are key tools, because again, part of some of the other programs that we have, again, have been oriented more toward a lot of retired CEOs, and that is great, but again, women come in to pitch them on an idea that they have, and they do not have familiarity with what the women are talking about—the market, the product, the solution. And so the Women Business Centers of the SBA helps fund a really key tool for somebody to just show up in a community and go, “Where do I get started?”

Mr. SHEPARD. I agree. My mother was an entrepreneur when I was young, and she could have really used those. And so there are a lot of women today benefiting from that Small Business Administration resource, and it is a wonderful thing we have.

Senator CANTWELL. And the other thing we have figured out is they do not want to borrow as much as the guys want to borrow. They are just a little more—they did not want to borrow, you know, \$500,000. They wanted to borrow smaller loan amounts, so also achieving that.

But I want to, again, thank Chairman Rubio for co-sponsoring this legislation. I am hoping our colleagues will help support this so that that private sector investment will not penalize women ownership from getting access to these Federal programs.

Thank you, Mr. Chairman.

Chairman RUBIO. Senator Kennedy.

Senator KENNEDY. Thank you, Mr. Chairman. Thank you—what do I call you, Commissioner Shepard?

Mr. SHEPARD. Associate Administrator.

Senator KENNEDY. Administrator.

Mr. SHEPARD. Associate Administrator Shepard.

Senator KENNEDY. Okay. Thanks for being here today.

Mr. SHEPARD. Thank you, Senator Kennedy.

Senator KENNEDY. Why don't you like SBICs?

Mr. SHEPARD. I actually do.

Senator KENNEDY. Well, you know, one of the things that I have learned since I have been up here—I have not been up here for a while—but you have to watch what people do, not what they say.

Mr. SHEPARD. Right.

Senator KENNEDY. So you have been Associate Director I think two terms.

Mr. SHEPARD. Yes.

Senator KENNEDY. And you are—while you are in office, the average number of SBICs approved is 11.

Mr. SHEPARD. Mm-hmm.

Senator KENNEDY. When you are out of office, the average is double that.

Mr. SHEPARD. Mm-hmm.

Senator KENNEDY. That tells me you do not like them.

Mr. SHEPARD. Yes.

Senator KENNEDY. Why is that?

Mr. SHEPARD. Yes. I do. I think in the Bush administration I was in that position for a little over a year—

Senator KENNEDY. Yes, and you averaged 11.

Mr. SHEPARD [continuing]. And we had the Great Recession, and we had a lot of funds that—

Senator KENNEDY. And you are averaging 11 now.

Mr. SHEPARD. And—and—

Senator KENNEDY. And the normal is 20.

Mr. SHEPARD. Mm-hmm.

Senator KENNEDY. I mean, if I am a small business woman or man, and let's say I have got an \$8 million company—

Mr. SHEPARD. Right.

Senator KENNEDY [continuing]. But I have got promising new software, and I go to SoftBank or Sequoia Capital and ask for money, they are not going to even see me, are they?

Mr. SHEPARD. Right. Right. Probably not. Yes.

Senator KENNEDY. Okay?

Mr. SHEPARD. Yes. Yes.

Senator KENNEDY. That is the purpose of an SBIC. Correct?

Mr. SHEPARD. Mm-hmm. In many instances, yes.

Senator KENNEDY. So let me ask you again, why don't you like them?

Mr. SHEPARD. Yes. Yes. Well, I do. I absolutely do.

Senator KENNEDY. Well, then why don't you approve them?

Mr. SHEPARD. Yes. Well, we have been approving them.

Senator KENNEDY. Not very quickly.

Mr. SHEPARD. We are doing—we are doing as good a job as we can. We can always do better.

Senator KENNEDY. Do you need more people, or do you—

Mr. SHEPARD. We may need—we may need more people.

Senator KENNEDY [continuing]. Or do your people just—I mean, it is not only that you are not approving them—and I am not suggesting that your analysis should not be rigorous—

Mr. SHEPARD. Yes, sure.

Senator KENNEDY [continuing]. But when you are not in office—

Mr. SHEPARD. Right.

Senator KENNEDY [continuing]. It seems to go much more quickly.

Mr. SHEPARD. Mm-hmm.

Senator KENNEDY. And it is not just the denial, it is the delay.

Mr. SHEPARD. Right.

Senator KENNEDY. That is what most people hate about government. It is the stall and restall.

Mr. SHEPARD. Sure.

Senator KENNEDY. I mean, if you continue going at the pace you are going, the average age of your applicants for an SBIC license—

Mr. SHEPARD. Right.

Senator KENNEDY [continuing]. Is going to be deceased.

Mr. SHEPARD. Mm-hmm. Mm-hmm. Mm-hmm. Yes.

Senator KENNEDY. So what is the problem?

Mr. SHEPARD. Yes. Yes. Well, I think, you know, last year we licensed 25, and we had a period of time where we actually licensed faster than we had ever done before, in 5.1 months. We had a lot of subsequent funds, so we licensed faster.

We are seeing more startup funds or new funds. Those take a little longer to process, and so that extends our licensing time from five months to, say, seven months.

Senator KENNEDY. Well, but, isn't there a—I am sorry for interrupting you but I have only got 5 minutes.

Mr. SHEPARD. Sure. Sure. I understand.

Senator KENNEDY. Rubio is tough.

Mr. SHEPARD. Yes, sir.

Senator KENNEDY. He is tough.

Mr. SHEPARD. Yes.

Senator KENNEDY. But if you have got a brand-new license application, but you have a lot of folks who have had one SBIC—

Mr. SHEPARD. Correct. Yes.

Senator KENNEDY [continuing]. And they are applying for a second one—

Mr. SHEPARD. Right.

Senator KENNEDY [continuing]. It would seem to me that the second one should go more quickly.

Mr. SHEPARD. We can move them faster.

Senator KENNEDY. No, you do not. No, you do not.

Mr. SHEPARD. Yes.

Senator KENNEDY. It takes just as long, and in some cases, longer, and I do not get it.

Mr. SHEPARD. Yes.

Senator KENNEDY. I mean, to me there is a—yes, there is a lot of venture capital out there. There is venture capital all over hell and half of Georgia.

Mr. SHEPARD. Yes. Sure.

Senator KENNEDY. But unless you are a big girl or a big boy, you are not going to have access to any of it.

Mr. SHEPARD. Right.

Senator KENNEDY. That is what the SBIC is for.

Mr. SHEPARD. Right.

Senator KENNEDY. That is your job.

Mr. SHEPARD. Yes. Yes.

Senator KENNEDY. Not once I do get an answer out of you guys, you just say, "Denied," and I say, "Why?"

Mr. SHEPARD. Yes.

Senator KENNEDY. And you say, "If I told you, I would have to kill you."

Mr. SHEPARD. Yes. Yes.

Senator KENNEDY. Why don't you tell people why you are lying to them?

Mr. SHEPARD. Well, we do.

Senator KENNEDY. No, you do not.

Mr. SHEPARD. We have——

Senator KENNEDY. Why isn't there an appeals process?

Mr. SHEPARD [continuing]. We—we—we have not had any denials at the agency committee level.

Senator KENNEDY. Yes. It is because you do not give them an answer.

Mr. SHEPARD. Well, we——

Senator KENNEDY. It is because you stall them and restall them.

Mr. SHEPARD. Well, we—we—we answer them as quickly as possible at that level, and we have approved several at that level, and we have not had a lot of denials there. I think one of the things to keep in mind is we cannot force capital formation. They have to decide to apply——

Senator KENNEDY. Okay.

Mr. SHEPARD [continuing]. And——

Senator KENNEDY. I am about to run out of time and I want to land this plane on time.

Mr. SHEPARD. Understood.

Senator KENNEDY. Mr. Shepard, I do not know you. I know you are a fine person.

Mr. SHEPARD. Mm-hmm.

Senator KENNEDY. I do not think you like SBICs. Either that or you have got folks who just are not competent.

Mr. SHEPARD. Okay.

Senator KENNEDY. I think applicants deserve an answer when they are denied. I think you should tell them why. I think that if you really do not support SBICs you are in the wrong job.

Mr. SHEPARD. Right. Understood. Yes.

Senator KENNEDY. And it does not look to me like, based on your behavior, you support them.

Mr. SHEPARD. OK.

Senator KENNEDY. Now I am not telling you, do not be rigorous in your analysis.

Mr. SHEPARD. Understood. Yes.

Senator KENNEDY. This is taxpayer money.

Mr. SHEPARD. Right.

Senator KENNEDY. But I am telling you, I am suggesting to you, if you have a bias against SBICs, you ought to go run for the Senate or something.

Mr. SHEPARD. Right. Right.

Senator KENNEDY. But you should not be doing what you are doing.

Mr. SHEPARD. Right. Well, I do like the program and would look forward to visiting more with your staff about some of these instances, and making sure that we clarify some things.

Senator KENNEDY. Thank you for your service.

Mr. SHEPARD. Thank you very much.

Chairman RUBIO. Before I turn it over to Senator Shaheen I want to just take on that, because I do not want to forget to bring it up. When we talked about the new models that you are going to be using to calculate the costs, it is going to include assumptions—I read them out already—macroeconomic factors, private equity elements, private equity fund characteristics. And you initiated this new model.

Are these assumptions that you are coming up with, are those required by the Federal Credit Reform Act or the Office of Management and Budget?

Mr. SHEPARD. The Federal Credit Reform Act does speak to the fact that you should have a model, that underlying model that mimics the type of investment activity. And so that is what we are trying to do with this Federal Credit Program.

Chairman RUBIO. Right. But the FCRA and the OMB only require the use of Treasury discount rates.

Mr. SHEPARD. Mm-hmm.

Chairman RUBIO. That is the only ones they require. So these are ones you chose.

Mr. SHEPARD. We are working on selecting them. They have not been selected yet.

Chairman RUBIO. But those are the ones you are leaning toward choosing or using, correct?

Mr. SHEPARD. Yes, sir. Correct. And we will vet that with OMB and make sure that it is done right. There is no question about that.

Chairman RUBIO. Yes, and I guess, building on what Senator Kennedy's question was, how is this evaluation of the program not you substituting your own priorities for those that Congress has laid out?

Mr. SHEPARD. Oh, and it is not intended to be a substitution, by any means, Chairman. It is intended to do a better job of making sure that we secure taxpayer dollars and that we do not have losses. So it is trying to improve the program to make it better from a loss standpoint.

Chairman RUBIO. Senator Shaheen.

Senator SHAHEEN. Well, just—my time needs to go back up to five minutes.

Chairman RUBIO. I do not even look at it so you can go ahead. I do—only for Kennedy do I look at the time. Everybody else—

Senator KENNEDY. You better watch Rubio.

Senator SHAHEEN. I know. Really. Just to be clear, so that I understand what your response was to Senator Rubio, I understood you to say that the criteria that you have laid out are not criteria that are required by the law. Is that correct?

Mr. SHEPARD. I—we have—I am not sure about that. We have actually—

Senator SHAHEEN. Well, can you get an answer for this Committee?

Mr. SHEPARD. I absolutely can. Yes. Yes, ma'am.

Senator SHAHEEN. Mr. Chairman, if you could share that answer as soon as we get it, I would appreciate it.

Chairman RUBIO. Sure. I think we know the answer but we are more than happy to hear what—

Senator SHAHEEN. I agree.

Mr. SHEPARD. Thank you.

Senator SHAHEEN. So I guess I have to say, Mr. Shepard, I found your responses to Senator Kennedy totally unacceptable, because the SBA's statistics show that the average licensing timeline for SBICs rose to 8.2 months in 2017, from 5.1 months in 2016, and that the program has led new license requests to decline from 29 in 2017, to just 17 in 2018.

So again, I do not know what has caused this, but I know that you are in charge, and that the program is going in the wrong direction.

Mr. SHEPARD. Mm-hmm.

Senator SHAHEEN. So I think it is incumbent on you to find out what is causing the decline in license requests and the increasing timeline, so that we can fix that.

Mr. SHEPARD. Correct. Yes.

Senator SHAHEEN. Because I agree with Senator Cantwell. As I have traveled around and looked at what is happening in the economy right now, one of the things that we know is that women-owned businesses are increasing much more dramatically than other businesses, women- and minority-owned businesses, and that they are employing people at a greater rate. And we also know that women-owned businesses have a much harder time getting access to capital.

And so I guess what I want to know is what is SBA doing to make clear to women and minorities that the SBIC program is available to help reduce barriers to new entrants. So what are you doing to reach out to women and minorities to ensure that they understand that SBIC is something that they can participate in as well?

Mr. SHEPARD. Right. Well, there are two answers. The Small Business Investment Companies who actually make the investments are the ones that would be having the majority of the dialog with those women-owned businesses and making investment decisions about whether they are going to invest in them or not.

On our side, in terms of licensing, it would be making sure that the female fund investors can invest, using SBIC as a vehicle for an investment fund. And we have a few, but as I mentioned, Senator Cardin, we need more, and we do not have an issue with that at all. We just do not have very many female prospective fund managers that come in seeking an SBA license to operate an SBIC.

Senator SHAHEEN. And so are there things that you think SBA might do to encourage more women and minorities to be able to do that?

Mr. SHEPARD. I think we could certainly improve in that area. Yes, ma'am.

Senator SHAHEEN. And what kinds of things do you think might be possible for SBA to do?

Mr. SHEPARD. I think we could maybe use some of our other partners within the SBA to communicate that message better, and also use our education team that we have in-house within the SBIC program to have better outreach to those groups and those entities.

Senator SHAHEEN. Well, I would certainly encourage you to do that—



Mr. SHEPARD. I appreciate that.

Senator SHAHEEN [continuing]. Because as we look at where job creation is happening, there are tremendous opportunities there. And so I hope SBA will encourage the SBIC program to be more inclusive.

Mr. SHEPARD. Yes, ma'am.

Senator SHAHEEN. Thank you, Mr. Chairman.

Chairman RUBIO. Seven minutes left. You did not need the reset.

Senator HAWLEY.

Senator HAWLEY. Thank you, Mr. Chairman. Mr. Shepard, I have got to be honest with you. My office has heard a lot of complaints from SBICs about your process, and to be frank with you about your leadership. And so like other members of this Committee I think I am trying to get to the bottom of this. But when I say "a lot," I mean a lot.

So was the SBIC approval process inadequate before you came to office? I mean, is that the issue here, that you have had to clean up? Is your position that we are approving way too many of these, and the whole thing needed to be overhauled?

Mr. SHEPARD. Not at all. I mean, there are certainly improvements that need to be made, and I have put those in the written testimony, and before you got here talked a little bit about some of those enhancements and improvements. But the intent is to make the program better and to streamline.

Senator HAWLEY. So that explains why there has been a 50 percent reduction in the approvals, in the way that Senator Kennedy was asking?

Mr. SHEPARD. Just the processes alone should not account for that. I think—

Senator HAWLEY. So do you know—how many staff are in your office?

Mr. SHEPARD. Total? We have got 82 is our count.

Senator HAWLEY. So how many staff vacancies are in the office?

Mr. SHEPARD. We have got 11. Eight are in the process of recruitment and three are about ready to be recruited.

Senator HAWLEY. What about senior management positions? Do you have any of those that are unfilled?

Mr. SHEPARD. We have a deputy position that needs to be filled. That is the only senior management.

Senator HAWLEY. You know, a major complaint from the SBIC is the time it is taking to process applications, schedule interviews, classes, even doing something as simple as actually sending a license to the applicant once they have been approved. What accounts for that? Are you not adequately staffed? Is your staff not good at their job? I mean, what is the—what are we to believe? What are we to conclude?

Mr. SHEPARD. Our staff is fantastic at their job, and they are wonderful people. And I think more of it, we could certainly look at our personnel and look at our size.

Senator HAWLEY. I mean, if your staff is really good at their job, but the program does not seem to be functioning, and the processes are fine, I mean, what are we left to—I mean, who is the weak link then? I mean, where does that leave us?

Mr. SHEPARD. Yes. The program has doubled in size, and so we have got a lot more work to do. And so we are certainly—we certainly could look at personnel and driving up those numbers.

Senator HAWLEY. Why don't you give applicants who deny the opportunity, or who are denied approval, the opportunity to amend their application, to account for whatever would have caused the denial?

Mr. SHEPARD. I think unless—unless it is an issue of—unless it is some kind of a legal issue, I do not know why we would not do that, and that is something I will look into with our team, because they certainly should have an opportunity to adjudicate or to come back around and have a fuller discussion.

Senator HAWLEY. It just seems strange that after applicants spend who knows how many hours—tens, hundreds of thousands of dollars, raising millions of dollars in private capital, seeking a license, that you do not give them either the courtesy of an explanation, to Senator Kennedy's point, or the opportunity to fix their application. I mean, that seems strange to me. Don't you think so?

Mr. SHEPARD. I would agree, and I need to look into more of why that may be happening and some of those areas where that is happening.

Senator HAWLEY. Let me ask you something else. In December 2018, Chairman Rubio's Spurring Business in Communities Act became law. I was not here then but that is an important bill to me, because it gives first priority to SBIC applicants who are located in under-licensed states like mine, like the State of Missouri, and it removes certain capital requirements to make it easier for applicants from underserved states like mine to participate in the program.

So that was over six months ago. Where are we on implementation?

Mr. SHEPARD. We are close and we are going to have it done by the end of the fiscal year, so in this next quarter.

Senator HAWLEY. So when can I expect to see results in Missouri small business investment as a result of your implementation?

Mr. SHEPARD. Yes. I think at the beginning of the next fiscal year, starting in that first quarter, we will start promoting that and talking about that program.

Senator HAWLEY. So you have taken steps toward implementation?

Mr. SHEPARD. Oh, absolutely.

Senator HAWLEY. Yes. For example?

Mr. SHEPARD. Well, we have taken steps toward finalizing the legislation, and we are starting to plan outreach to talk about and announce it.

Senator HAWLEY. Wait. Okay, wait. So you are starting to plan outreach. So you have not actually done any implementation?

Mr. SHEPARD. We have an event in Oklahoma planned in August, to talk about—to talk about the underserved and the under-licensed.

Senator HAWLEY. Okay. So that will be your first event.

Mr. SHEPARD. Yes, sir.

Senator HAWLEY. So so far you have not done anything.

Mr. SHEPARD. So far what, sir?

Senator HAWLEY. So far you have not done anything. You said in August. This is June.

Mr. SHEPARD. Oh, this is outreach, outreach about the program. We are close to implementation and should have that done in about—

Senator HAWLEY. So you have not done any implementation yet?

Mr. SHEPARD. No implementation yet. No, sir.

Senator HAWLEY. Okay.

Mr. SHEPARD. Yes.

Senator HAWLEY. You know, are you aware that Committee staff invited several SBIC fund managers to testify here today but none agreed to do so, for fear of reprisal from you?

Mr. SHEPARD. I did not know that, and that—

Senator HAWLEY. Don't you think that is alarming?

Mr. SHEPARD. It is unfortunate.

Senator HAWLEY. What accounts for that?

Mr. SHEPARD. I do not know. I do not know. That should not be the case, but I do not know.

Senator HAWLEY. No, it should not be the case. What should we do about that, do you think?

Mr. SHEPARD. Yes. I do not know. They should be here. I would like them to be here. I would like us to have a good conversation with those SBIC fund managers.

Senator HAWLEY. Hm. Have you ever delayed or denied the processing of an applicant as a form of punishment or reprisal?

Mr. SHEPARD. Absolutely not.

Senator HAWLEY. You are sure about that?

Mr. SHEPARD. I am pretty sure. Yes, sir. I do not know why anyone would ever—

Senator HAWLEY. You are pretty sure or you are 100 percent sure?

Mr. SHEPARD. I am 100 percent sure I—

Senator HAWLEY. And you are—you are—

Mr. SHEPARD [continuing]. Would not do that.

Senator HAWLEY. Okay. You are on the record and you are under oath.

Mr. SHEPARD. Understood. Yes, sir.

Senator HAWLEY. Thank you, Mr. Chairman.

Chairman RUBIO. I guess, I know it has been a tough hearing. You can hear some of the pushback and I would just comment, you know, we read through some of this and you sort of see some of the language—we see the performance, and we see sort of in your testimony and this discussion about providing sort of private equity-type structures and metrics to the program moving forward as a way to justify sort of why the program is not delivering the same numbers as it did in the past or historically has done, and sort of couched in the sense that we want accountability for taxpayer dollars.

But I think one of the reasons why this program exists is the acknowledgment or the belief by members of Congress that private equity—I think this problem has gotten worse—fundamentally undervalues innovation. And so you see these buzz words like private equity to justify the reduced activity and I get concerned, I personally do, you know.

And I think one of the trends we have seen is the finalization of our companies, particularly the management of companies, has come into being. You have seen less investment in things that have a longer life, for example physical assets like equipment or machines or plants or even research and development. Industrial innovation has paid a price, in my view anyways, as we financialize corporate governance and corporate decisionmaking. At some point, the financial markets concluded that it was just too risky to invest in these sorts of things anymore.

And so it would be ironic if the very program that was designed to help small business overcome financialization of these decisions was financialized itself.

And so when we add what we have heard from you today, these new metrics that are being designed, with the numbers that we have seen and some of the other things that have been brought up, I think you understand that this Committee is pretty—for lack of a scientific term—fired up about not just the direction this program is going but our view as to the direction it is being taken.

And I hope that came across today. It certainly did for me.

Mr. SHEPARD. Yes, sir.

Chairman RUBIO. I do not know if the ranking member has anything to add.

Senator CARDIN. Thank you, Mr. Chairman.

Mr. Shepard, I think there is a general consensus here on a couple of things. First, we like the SBIC program. Democrats, Republicans, small businesses, we like the SBIC program.

Secondly, we are not satisfied with the time it takes for an application to be received and the numbers that are being approved and the outreach to underserved communities not having investors.

I would point out, you indicated that the program has grown. Our information shows that actually there was a reduction in the total funds in the SBIC from fiscal year 2017 to fiscal year 2018. It actually went down.

So that is unacceptable. When you look at the total volume today, it is about what it was four years ago. So it is not the type of growth that we would have expected in the SBIC program.

So this is a hearing on reauthorization. There is something not working. If it is the law, let us know how we need to change the law so Congress can give you the tools you need through statute. If it is the way that your agency is organized and the resources that you are getting, let us know that so that we can deal with it. If it is a matter of capacity in your agency, we need to know that also. That is our responsibility on oversight.

But the bottom line is this is a very important program. It is not meeting the expectations that we have set for it in total availability and it is not fairly distributed among all of the communities that need small business financing.

So this is an opportunity for you to present to us ways that we can improve the law and give you the tools you need because you have bipartisan support for this program. So I would just urge you to take advantage of that and get that information to this committee.

Mr. SHEPARD. We will do so and appreciate that, Senator. Thank you.

Chairman RUBIO. Senator Hawley, anything else?

Senator HAWLEY. No.

Chairman RUBIO. Thank you. Thanks for being here today. We are going to transition to the second panel. Again, our apologies for the late start.

I will introduce the second panel as they come up. It will buy us some time here.

Brett Palmer is the President of the Small Business Investor Alliance. In his role at the SBIA, he represents small business investment companies and the institutional investors in these funds.

Mark Muro is the Senior Fellow and Policy Director of the Metropolitan Policy Program at the Brookings Institution. He focuses his work on regional technology, ecosystems and economic development. He has published extensively on digital trends, automation, advance industries, and regional development issues.

Dr. Banu Özkazanç-Pan—did I say that right?

Ms. ÖZKAZANÇ-PAN. Pretty good.

Chairman RUBIO. I like getting names right.

Özkazanç-Pan—

Ms. ÖZKAZANÇ-PAN. Özkazanç-Pan.

Chairman RUBIO. Özkazanç, I have to say it faster, perfect. Dr. Özkazanç-Pan, is an Associate Professor at the University of Massachusetts and a Visiting Associate Professor of Sociology at Brown University. Obviously, you do not have a non-compete there. That is great, you are in two places.

Her work examines diversity and inclusion in organizations and entrepreneurship. Her latest research focuses on the effects the venture capitalists have on the flow of resources in entrepreneurial ecosystems.

So I will just begin from my left to my right. Mr. Palmer, thank you, and the floor is yours.

**STATEMENT OF BRETT PALMER, PRESIDENT, SMALL  
BUSINESS INVESTOR ALLIANCE, WASHINGTON, DC**

Mr. PALMER. Thank you, Chairman Rubio.

My name is Brett Palmer. I am President of the Small Business Investor Alliance.

I would like to thank the Chairman, the Ranking Member, and the other Senators participating today for taking part in this hearing, for reviewing the Small Business Investment Company program, discussing small business investment generally, and answering any questions you may have about it.

The SBIA is the trade association of small business investors that includes the SBIC industry. The goal of the SBIA is to promote a healthy ecosystem for small business investing, one that benefits both small businesses and their investors, and thereby promoting economic growth and job creation.

Small business investment companies have been around since 1958. And what was true in the 1950s will always be true. Small businesses need external capital to grow and to thrive and to reach the next level. And it is really hard to access that type of capital.

Debt and non-levered SBICs have increased the amount of small business investment capital, with over \$28 billion invested domestically over the last five years. All SBIC investments must be

used exclusively for domestic small businesses with at least 25 of those investments going to smaller enterprises, which is a smaller standard than the small business standard.

SBICs cannot be used for an investment for short-term projects and cannot be used for moving jobs offshore. By law, SBICs are focused on America.

SBICs provide an important national benefit because SBICs are often the first institutional capital into small businesses. SBICs help with not only capital but also expert advice on how to scale up and professionalize as a company grows.

SBICs invest across a broad range of industries and across a broad range of geographies. It is common to see investment in manufacturing and other not so flashy industries and in low and moderate income areas, as well as parts of the country generally overlooked or flown over.

In contrast, venture investment is extremely concentrated and a lot of private equity investment is also concentrated. SBICs invest in a far, far more broader footprint. This is one of the reasons why we need more SBICs and we need them in more places.

The SBIC program has a very strong taxpayer protection system built into the system. It is maintained at zero subsidy now, the SBIC debenture program, for about 22 years since Congress reformed in the late 1990s.

The SBIC program continues to have some of the healthiest and strongest payback period in its 60-year history. The annual charge that Chairman Rubio mentioned is a fee that covers potential losses to the program. It is at its lowest rate in 60 years. The SBIC leverage has continued to operate that zero subsidy and we expect that to continue.

There is a strong private sector interest in investing in small businesses, and particularly via Small Business Investment Companies, which is critical because the private sector is the leading component to make the program work. This is not a subsidy program. It is not a grant program. It is not a prop up failing businesses program. It is a market driven program where market forces are aligned with a clear public benefit of more jobs, more innovation, and more geographic dispersion of opportunity.

A 2017 Library of Congress study, which you all have mentioned, highlighted that the SBIC program has backed businesses that created 3 million jobs and support an additional 6.5 million jobs over the 20 year period, an incredibly efficient rate to the taxpayer. This study was performed by researchers from Duke and Pepperdine's Business School.

Your average debenture-backed SBIC business added 125 new jobs. Non-levered and equity oriented SBICs created over 530 new jobs per small business. That is an average, that is not universal for each one. But to put that into perspective, over the 20-year period of the study, that represents about 7 percent of the net new jobs in the United States from SBIC-backed businesses. That is an extraordinary number for a little known program, but that is what it is supposed to do.

Most of these companies will never even consider going public. They will never be written about in the Wall Street Journal. But they almost all grow, changing lives and supporting communities.

All of these quiet little business successes add up to something big, which is the reason the SBIC program has broad bipartisan support. The SBIC program is good, but it is not perfect and there are limits to any government program. Every government program can benefit from congressional oversight, regular reforms and updates, and we thank you for having this hearing.

We welcome the oversight and we want to work with Congress to make improvements. There are still significant market gaps that are leaving too many small businesses unable to grow due to a lack of capital.

My written testimony, which is far more robust than you see from normal congressional testimony—it is almost a phone book that you see before you—is broken into three categories because it is an unusual program. It is a plain English of how the program works, is the first section.

The second section is ideas for improving the operation of the program and for using the program to shrink what is commonly called the “valley of death” because there are still a lot of businesses that are good businesses that are not able to access the capital they need to access that next level.

And third, and regrettably, is a sampling of the profoundly frustrating dumbfounding mismanagement that is creating unnecessary risks and cutting off of capital to small businesses.

I would like to thank Senator Rubio, Coons and others here for their efforts to be thoughtful and deliberate about manufacturing in particular, and we would like to see an international policy as we compete globally against the Chinese and others to really create that long-term investing.

I would be happy to answer any of your questions.

I would also mention, with the few seconds I have left, that I would like, if the chance presents itself, to respond to some of the questions directed to the first witness that I think, frankly, need significantly more fleshing out to give a full picture of the truth.

But with that, I would hand it over to Mr. Muro.

[The prepared statement of Mr. Palmer follows:]



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SMALL BUSINESS  
INVESTOR ALLIANCE

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SBIA is the voice of small business investment. Over the past 10 years, SBIA's members and SBIC funds have invested more than \$42 billion across the United States.

## REAUTHORIZATION OF SBA'S SMALL BUSINESS INVESTMENT COMPANY PROGRAM (SBIC)

**SBIA's Testimony and Report**

1. Testimony
2. Report on the SBIC Program

Prepared by:  
**Brett Palmer**  
President, Small Business Investor Alliance (SBIA)

Prepared on:  
**June 26, 2019**





Brett Palmer  
President, Small Business Investor Alliance (SBIA)

June 26, 2019

The Honorable Marco Rubio  
Chairman  
U.S. Senate Committee on Small Business &  
Entrepreneurship  
Washington, D.C. 20510

The Honorable Benjamin Cardin  
Ranking Member  
U.S. Senate Committee on Small Business &  
Entrepreneurship  
Washington, D.C. 20510

**Re: SBIA Testimony and Report for Reauthorization of SBA's Small Business Investment Company Program**

Dear Chair Rubio, Ranking Member Cardin, and Senators of the Committee:

The Small Business Investor Alliance ("SBIA") is pleased to submit the following report about the U.S. Small Business Administration's Small Business Investment Company ("SBIC") program as our testimony regarding this hearing on the "Reauthorization of SBA's Small Business Investment Company Program." SBIA is the national association that has represented the Small Business Investing Companies since their inception over 60 years ago.

SBICs are an American success story and are an example of a successful public policy that aligns the power of private market with the public interest of job creation and economic growth. SBICs invest exclusively in domestic small businesses, creating jobs and empowering American small businesses to compete in a global economy.

The SBIC program, like all government programs, should be regularly examined for effectiveness and for opportunities to make reforms to better serve the American people. Our testimony explains the SBIC program; explains the role it fills in aiding small businesses and job creation; and puts forward several ideas for Congressional consideration to improving the program and broadening the numbers and types of small businesses that can benefit from accessing SBIC capital. SBIA is disappointed to also have to include a section listing some of the mismanagement that is currently plaguing the SBIC program and thereby harming small businesses and creating unnecessary risks to the taxpayer.

SBIA appreciates the opportunity to present these comments and looks forward to collaborating with the Committee in its work to reauthorize the SBA's SBIC program to ensure America's small businesses and the communities served have access to the capital they need. On behalf of the small business investors, I look forward to answering any questions you may have.

Sincerely,

Brett Palmer  
President  
Small Business Investor Alliance

## Report on the State of the Small Business Investment Company Program

*Prepared by the Small Business Investor Alliance (SBIA)  
June 26, 2019*

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## Section One

## SBIC Program Overview

- The 60+-year-old SBIC program is a market-driven platform that serves an important public purpose of facilitating and amplifying private investment into domestic small businesses. President Eisenhower, as the former Allied Commander in World War II, recognized that America had won World War II and would be competing to win the cold war with the dynamism of American industry and our system of free enterprise as a strategic alliance. Eisenhower signed the Small Business Investment Act and created the SBIC program in part to help ensure that the United States would continue to be a dynamic economy and industrial leader.
- Congress declared in its original authorizing legislation that the SBIC program should “stimulate and supplement the flow of private equity capital and long-term loan funds which small business concerns need for the sound financing of their business operations” while also stimulating the national economy and job growth.<sup>1</sup>
- As of March 2019—halfway through the fiscal year—the SBIC program included more than 300 licensed funds, representing approximately \$30 Billion in small business investment capital. Over the last five fiscal years, SBICs have invested nearly \$6 billion annually in over 1,100 small businesses.<sup>2</sup> Companies that in their early stages received SBIC investments and have subsequently grown into icons of American industry include Federal Express, Apple, Intel, and Callaway Golf. Many more small businesses backed by SBICs have grown from smaller businesses into robust, sustainable mid-sized businesses that bring prosperity and employment to communities across the country.
- SBICs are federally regulated, privately-owned and managed investment funds that invest exclusively in domestic small business. SBICs, primarily formed as limited partnerships, provide long-term loans, equity, or debt-equity investments along with management assistance to small businesses across a range of sectors, geographic locations, and stages of growth. Some SBICs specialize in an industry sector while others invest more broadly. There are various forms of SBICs:
  - *Leveraged (Debenture) SBICs* increase the amount of capital available for domestic small business investing by accessing the SBIC credit facility. SBIC leverage is borrowed at the fund level, not at the small business level.
  - *Non-leveraged SBICs* do not seek or receive SBA leverage. Non-levered funds can provide both debt or equity. They are able to provide more equity to small businesses than levered (debenture) SBIC funds because they do not need to make interest payments on SBIC leverage. Banks commonly invest some of the Institutional Capital into these funds. These funds have no taxpayer risk.

<sup>1</sup> Small Business Investment Act of 1958, Pub. L. 85-699 (Aug. 21, 1958). 15 U.S.C. 661.

<sup>2</sup> SBIC Program Overview, U.S. Small Business Administration (March 31, 2019). The number of licenses are inflated because SBA is not reporting a significant number of licenses that have been submitted for surrender or are inactive.

- Bank-Owned SBICs are fully owned or funded by a single bank. Like other non-levered SBIC funds, they do not access leverage and have no taxpayer risk. Like other non-levered SBICs, these bank-owned SBICs can provide debt or equity. Since these SBICs are unlevered, they are able to provide more equity because they do not have interest payments to make on SBIC leverage.
- Most SBICs are Levered (Debenture). These levered SBICs invest private capital that is amplified by access to an SBA-backed credit facility using the Federal Home Loan Bank system. This permits individual SBICs to multiply paid-in private capital up to three-times or up to \$175 million, whichever is less. The maximum leverage for an SBIC family of funds (a group that hold multiple SBIC licenses) is currently \$350 million. Three times leverage is the statutory limit, which is rarely used and which the SBA will only permit under unusual circumstances. Most levered SBIC funds lever private capital one to two times their private capital.
  - For example, an SBIC may raise \$87.5 million in private capital and then, after licensure, may access up to an additional \$175 million line of credit (SBA leverage), which combines for a total of \$262.5 million – a very large boost in the small business economy. The leverage is provided at a zero-subsidy rate (no appropriation necessary to fund up to \$4 Billion a year in SBC leverage) and is eventually paid back in full to the SBA (plus interest and fees).
- Unlike many government programs, the SBIC private capital is in first-loss position, meaning the private investors lose their money before the taxpayer is exposed to risk of loss. In practice there is generally a 33-50% private asset coverage of the leverage. This is an important taxpayer safeguard and a key reason why the SBIC program has been able to maintain its zero-subsidy rate. SBICs are also very different from the SBA's other capital programs because of the Portfolio Effect of the SBICs. A loss in a single small business investment does not have to expose the taxpayer to a loss – no individual small business investments are guaranteed by the taxpayer. Losses in a single investment can be backfilled by the profits of other small businesses in the portfolio. In the other SBA programs (504 and 7a), the government guarantees the performance of each loan to each individual small business and shares first loss position with the private sector (offset by fees).
  - The SBIC program is effective and distinct because the private sector leads with its capital and investment expertise, and then SBIC leverage follows to augment the impact of the private investment. The government does not pick winners and losers, private investors guide capital to the companies with the best potential.
  - It is a mark of SBIC industry pride that the program maintained its zero-subsidy throughout the Great Recession. It is important to SBICs that this zero-subsidy rate be protected by prudent regulatory policies and good program management.
  - This successful alignment of private markets with public goals where private capital leads and the SBA-leverage follows provides SBICs a deeper capital pool from which to make equity and debt investments in qualifying small businesses.

- A recent independent study prepared for the Library of Congress found that SBIC-backed small businesses created almost 3 million new jobs and supported an additional 6.5 million jobs over the 20-year period of their study.<sup>3</sup>
- Every one of the jobs created by each of those small businesses was a gain to the communities where they are located and to the broader regions from where they drew employees and to whom they provided goods and services. These businesses and jobs continue on, succeeding independently of SBICs after the investment is completed. These small businesses are not “propped up” or subsidized.
- These investments are in real companies with real staying power and real growth potential.

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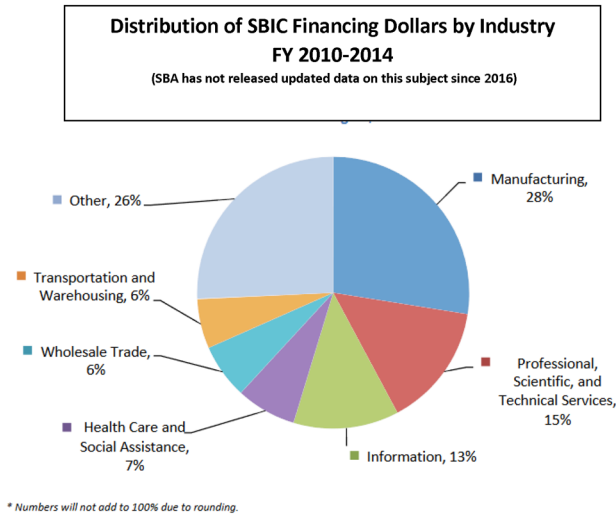
<sup>3</sup> Paglia and Robinson, Measuring the Role of the SBIC Program in Small Business Job Creation, Report for the Library of Congress, at 4 (January 2017) <[https://www.sba.gov/sites/default/files/articles/SBA\\_SBIC\\_Jobs\\_Report.pdf](https://www.sba.gov/sites/default/files/articles/SBA_SBIC_Jobs_Report.pdf)>.

### SBIC Frequently Asked Questions

#### *How does the SBIC Program Help the Taxpayer and the American Public?*

- The SBIC Program helps the taxpayer by providing capital to growing small businesses that in turn hire more employees, invest in capital improvements, and generally grow the economy. A 2017 study by the Library of Congress found that 1 new job was created for every 35 dollars of taxpayers' money spent administering the program. (The leverage operates at zero subsidy, but there are still some administrative costs.) Correlation is not causation, but there is no doubt that the ability of successful small businesses to access growth capital empowers them to grow and hire more employees.
- SBIC investments are made in areas of the country and in industry sectors that are commonly overlooked by conventional venture capital and private equity. The overwhelming percentage of venture capital is invested in Northern California and the New York to Boston corridor. While SBICs do invest in those areas, SBICs invest most of their capital in places other than this investment footprint. For example, from 2014-2018, 22% of SBIC investments were in areas certified as Low-Moderate Income. Even SBICs that are primarily located in population centers regularly invest well outside of their local area, so the SBIC program helps move capital to underserved areas – both urban and rural.
- SBIC investments are commonly made in industry sectors largely passed over by many conventional venture capital and private equity funds, including manufacturing and asset-light services businesses.

Figure 1:



(Chart is from SBA's most recent Annual Report on the SBIC program FY 2014)

***Is the SBIC Program Effective?***

- Yes. Multiple studies, including a 2017 Library of Congress study (attached) have found the SBIC program is very effective at supporting growing small businesses and creating jobs.
- With modest reforms, it could be even more effective, with broader benefits to more communities.
- There are additional studies completed by the Library of Congress that were supposed to be released in 2017 but have yet to be released by the SBA.

***Is the SBIC Program an Efficient Use of Capital?***

- Yes. It is one of the most efficient, job-creating programs within the government. According to a 2017 Library of Congress study, only \$35 in average administrative government costs were associated with creating each new job. There were only \$11 in average administrative costs for each job created or sustained.<sup>4</sup> Further, the fact that the SBIC program's leverage has successfully maintained its zero subsidy for so long is a testament to its operational effectiveness and efficient use of capital.

<sup>4</sup> Paglia and Robinson, *supra* note 4, at 2.

***Is SBIC Investing the Same as Bank Lending?***

- No. SBIC investing and bank lending are very different.
- SBICs provide education, training, and professional guidance to their portfolio companies that banks generally do not provide.
- Banks are often only able to provide conventional lending to a small business *after* an SBIC has invested in a small business.
- SBICs provide long-term capital that empowers small businesses to survive and recover from the inevitable surprises that can happen in business.
- SBIC capital can be in the form of debt, equity, or both.
- Banks and SBICs collaborate but offer different types of capital, so they do not compete.

***Does SBIC Investment Displace Conventional Bank Lending?***

- No. Banks are partners, not competitors to SBICs.
- Banks are often only able to provide capital after a business has received SBIC capital because the SBIC capital changes the capital structure of the business and thereby makes it more “bankable.”
- Over 500 banks, ranging from small community banks to large banks, are investors in SBIC funds.
- Some banks own non-levered SBIC funds and other banks are forming their own internal SBIC units to provide equity capital that the banks cannot otherwise provide.
- If small businesses could access this capital from banks, they would get bank loans because there are thousands of banks and conventional bank lending is less expensive.
- The Library of Congress completed a SBIC study in 2017 (that SBA is still blocking the the release of) is expected to report that:
  1. SBICs spread capital in a more dispersed manner across the country than conventional venture capital and private equity.
    - a. The SBIC program provides funds for deals that are more widely geographically distributed than by the broader fund community.
    - b. There is a lower concentration of SBIC capital on the west coast.
    - c. More of SBIC funds go to underserved regions in the north and south.
    - d. SBICs deploy funds towards different sectors differently than other private sector funding.
    - e. SBICs are generally deploy their largest concentration of dollars towards the business-to-business sector. SBICs are also less likely to invest in sectors targeted by other types of financing.
    - f. Sectors with high capital requirements, like energy and healthcare are likely to have lower coverage by SBICs.
  2. SBICs investment supports companies less likely to be considered by traditional private equity investors.
    - a. SBICs invest in companies that are less profitable than those invested by traditional growth capital and debt funds of similar fund size.
    - b. SBICs are investing in companies that might look unattractive from the point of view of a traditional private equity investor, either because a company operates in a less profitable sector or because the small business faces risks not attractive to other investors.



Figure 2:

## Comparison of Conventional Bank Lending and SBICs

	Bank	SBIC
Provide Debt	Yes	Yes
Provide Equity	No	Yes
Provide Convertible Debt	No	Yes
Provide Unitranche Capital	No	Yes
Can revoke capital on 30 to 60-day notice in the event small business hits a snag or if there is a macroeconomic disruption?	Generally, Yes	No
Are loans required to be fully collateralized?	Generally, Yes	No
Cash flow lending	Limited	Yes
Able to provide Capital to businesses that are not otherwise bankable	No	Yes
Commonly has a formal role on the Board of the Small Business	No	Yes
Provides management assistance to help the small business grow and have good governance	No	Yes

**Does the Government Own Any Part of these Small Businesses?**

- No. The government does not invest in or own any portion of any small businesses.
- There was a time (1994-2004) when the government effectively participated in the ownership of some types of SBIC funds, and therefore the small businesses, but that program ceased licensing these funds 15 years ago (2004).

**Is the Government a "Limited Partner" in SBIC Funds or Does It Own a Part of the SBIC Fund?**

- No. The government manages access to and guarantees a private sector credit facility but is not a "Limited Partner." The government is in a far more advantaged position than the private sector limited partners because the SBA leverage must be repaid before private investors are repaid.
- The SBA does not own an interest in SBICs or their portfolio companies.
- The SBA stopped being a "fund of funds" and stopped being a "Limited Partner" with the end of licensing funds where the government participated in the profits and losses (last licensed in 2004).
- The SBA is a regulator and a guarantor of the SBIC leverage credit facility.

Figure 3: Can the 7a and 504 programs do what the SBIC program is doing?

	SBA 7a	SBA 504	SBA SBIC
<b>Government (Taxpayer) guarantee on each individual investment</b>	Yes	Yes	No
<b>Must the small business have collateral or a personal guarantee to loan against?</b>	Yes	Yes	No

**Does the Government Choose Which Small Businesses Receive Capital?**

- All SBIC investments are made entirely by the private sector via investing professionals without the government's direct involvement.
- Investments are made by the private sector for real economic reasons. SBICs invest in growing small businesses and then notify the SBA which small businesses received capital after the investment has been made. There are size standards and other basic requirements and taxpayer protections that must be adhered to, but government involvement stops there.
- The program is successful at creating jobs and growing small businesses because it allows the private sector to find the businesses with the greatest growth potential and direct capital to them.

**What Happens if an Investment Underperforms?**

- A single SBIC will invest in many different small businesses.
- Unlike the 7a and 504 loan programs, when a single investment underperforms or loses money, only private capital is lost, not taxpayer guaranteed capital (leverage). The profits from the other portfolio investments cover the losses from the isolated underperforming investment(s). If the profits from the other portfolio investments are inadequate to cover all the losses, then the private investors' capital is lost before taxpayer money is at risk. There normally a large private capital cushion that would need to be exhausted before the taxpayer guarantees would be realized.
- Even if the guarantees would be used, SBIC funds pay an annual fee on their leverage that is designed to offset losses and maintain the statutorily required zero subsidy rate. SBA can cut off SBICs from accessing additional leverage or trigger an orderly liquidation process run. Even if a fund is ordered into orderly liquidation, it does not necessarily lose private capital or realize losses for the taxpayer.
- The "annual charge" is a fee on leverage used to prevent taxpayer losses and to maintain the zero subsidy on the program. The current Annual Charge is the lowest rate in the 60+ years of the program because SBICs have done such a good job at investing and protecting the taxpayer. However, SBIA has for some time flagged this record low Annual Charge as worthy of cautious review because at some point investment losses will revert to something closer to the historical norm and SBICs want to make sure the taxpayer is protected for the long term.

***What Built-in Accountability Exists in the SBIC Program?***

- There is extensive accountability built into the program.
- Private capital being in first-loss position is a very effective accountability tool because there is no “gambling with other people’s money.” Private capital being in first-loss position is an important, built-in taxpayer safeguard.
- The SBA has reporting obligations that ensure the SBA is fully apprised of the health of the fund, and the funds receive independent audits plus SBA on-site examinations. The SBA can cut off underperforming SBICs from further leverage and can even require disgorgement if an investment does not meet the SBA’s statutory and regulatory requirements. SBA can require an orderly wind down of the SBIC and limit SBIC fund managers’ compensation. In extreme cases, SBA can remove the fund managers.

***Are Repeat Licensees a Good Thing?***

- Repeat licensees are exceptionally good for the small businesses and the taxpayer.
- Repeat SBICs specialize in small business investing, which is good for small businesses, the SBA, and ultimately the taxpayer.
- SBICs are only able to receive an additional license if their previous SBIC fund was a success and the private sector was willing to commit its own money first. The private sector leads, and only then can a license be issued: the market speaks before the SBA licenses. Keeping successful fund managers in the program and culling poor performers is one of the reasons the program has been so good at growing businesses and has been able to sustain its zero-subsidy rate.
- Congress recognized the importance of repeat licensees by raising the “family of funds limit” to allow more successful managers to continue to invest more money into more growing small businesses. The GAO studied this issue in 2016 and found repeat licensees were far less likely to be placed by SBA into an orderly wind-down than first time funds.

***Is the SBIC Program Stress Tested and Sound?***

- The Great Recession and Financial Crisis were a real-life stress test. Unlike other SBA programs, the SBIC Debenture program was able to maintain its zero-subsidy rate.
- Further, many small businesses were able to survive the Great Recession because they were backed by SBICs. Banks were forced by their regulators to pull lines of credit from thousands of small businesses, which then failed. SBIC-backed small businesses benefitted from the longer-term capital provided by SBICs and had a much better chance of surviving.

***What can under-licensed states do to get more SBIC small business investment?***

- In general, smaller states that are difficult to reach tend to attract less investment, but investments are still made in those states and more can be done to improve their attractiveness.
- First, since investing in small business is very much dependent on personal relationships, we need to build more of those relationships in under-licensed states. These relationships commonly start with relationships with banks. Getting banks to invest in SBICs would not only provide solid returns to the

banks, but it would also create a connection between SBICs and the small businesses served by the local banks.

- Banks in under-licensed states can form their own SBIC fund. These bank-owned, non-levered SBICs can use their extensive networks to provide equity to small businesses and create relationships with both the bank for senior lending and other SBICs for subordinated debt access.
- SBA needs to make the licensing process more consistent because newer, smaller small business investment funds are easily scared off by regulatory uncertainty.
- SBA needs to make it less painful and less expensive to start and run smaller small business investment funds outside of the major money center cities.
- Finally, investment bankers, business brokers, and small business owners themselves can reach out to SBICs and start the business relationship.

## Section Two

## SBA Reauthorization: SBIA Recommendations for SBIC Program Reforms

**All proposals are designed to create a more efficient private market for small business investing, reduce waste of taxpayer money at SBA, increase capital access for small businesses, and maintain strong taxpayer protections.**

Chairman Rubio and the Committee is undertaking a reauthorization of all SBA programs for the first time in 20 years. As it pertains to SBICs, SBIA has proposed reforms for all phases of the program. Below, the reforms are broken into several categories: 1) Operational reforms, 2) Licensing Reforms, and 3) New Proposals to expand access to capital, particularly access to smaller investments and smaller equity.

### *i. Operational Reforms*

- ***e-Signatures***

**Background**--SBA requires physical paper documents and physical "wet signatures" for many documents. Electronic documents and signatures are the norm in the private sector and are secure. Further, the Electronic Signatures in Global and National Commerce law ("E-SIGN") grants legal recognition to electronic signatures and records if all parties to a contract choose to use electronic documents and to sign them electronically.

**Suggested Change**--SBA cease requiring any documents to be submitted in physical form and should accept all documents electronically. SBA should not require "wet signatures" and should accept digital signatures.

**Impact of Change**--This will reduce costs, delays in transmitting documents, clutter, and lost documents/forms for both SBA and the private sector. This will also make it easier for SBA to find its own records.

- ***SBIC Statutory Minimum Capital***

**Background**--There is currently a minimum size limit for SBIC funds at \$5 million. This is appropriate for licensure, but becomes a problem as funds wind down, particularly smaller SBIC funds. A \$15 million SBIC will hit the limit far earlier in their lifecycle than a \$150 million fund. This limit should only apply to initial licensure. Further, the SBA is strongly averse to licensing, even on a non-levered basis, small business funds with less than \$20-30 million in private capital.

**Suggested Change**--Clarify the \$5 million minimum size limit for SBICs to apply only to the amount of capital at time of licensure and that SBICs (particularly smaller funds) can continue to operated fully below this threshold.

**Impact of Change**-- This will benefit very small funds who invest in the smallest businesses. This poses *no additional taxpayer risk*.

- ***SBIC Unwritten Licensing Minimums***

**Background**--There is currently a statutory minimum size limit for SBIC funds at \$5 million of private capital. This is appropriate for licensure, but becomes a problem as funds wind down, particularly smaller SBIC funds. However, in most cases the real licensing minimum is much higher than the statute indicates. The SBA is strongly averse to licensing funds with less than \$20-30 million in

private capital. That makes sense for SBIC funds in large money center cities, but it is a real barrier and discouragement for smaller funds to form. One key aspect of smaller funds is that they invest in the smaller end of the small business spectrum. Yes, smaller funds can be riskier because smaller businesses, particularly those that are below \$1 million in EBITDA, but with the SBIC program seeing investment losses at a 60-year low, there appears to be room to license more smaller funds in smaller cities and less populated regions. It is important to note that is far more labor intensive for SBA to review and license smaller SBIC funds, but it is worth the benefit to the public.

**Suggested Change—** SBA should encourage and welcome smaller funds to form SBICs. SBA should clarify what amount of capital they really require for licensure.

**Impact of Change--** This will benefit very small funds who invest in the smallest, growing businesses. There is a clearly a market gap for smaller businesses in the sub \$1 million EBITDA range for debt and particularly equity.

- **Structural Barriers to Smaller SBIC Funds**

**Background –** Most of the costs of forming an SBIC and running an SBIC are fixed costs. These costs are significant. Because most of the costs are fixed, it is far more painful and daunting to form a smaller SBIC than it is to create a larger fund. All SBICs are investing in domestic small businesses, but there are too few smaller SBIC funds who are better scaled to provide capital to the smallest businesses.

**Suggested Change –** SBA should reduce the licensing fees and regulatory costs for smaller funds. Smaller funds take more time and effort for SBA to vet, but this additional effort is worth filling more of the market gap.

**Impact of Change –** There will be a greater number of smaller SBICs formed and thereby increase the amount of capital available for smaller businesses and businesses located in less populated areas.

- **Overline – Timeline for SBA Action**

**Background--**SBA limits the amount of capital leveraged SBICs can invest in a single small business – an overline limit. To put this concept in a simpler vernacular, this regulation limits and prevents putting too many eggs in one basket. However, there are times, particularly for smaller funds investing in smaller businesses, that this overline needs to be waived. For instance, if a business hits a rough patch (not rare for small businesses) it may need a follow-on investment to weather the storm. These are very time sensitive investments. SBA is authorized to approve these overline investments. SBA often can take many months to decide, by which time the business may have failed due to a lack of investment. SBICs sometimes face the problem of saving a small business (and the jobs it supports) or violating the overline rules while waiting for a likely approval of a waiver.

**Suggested Change--**SBA should be required to give a yes or no answer to any overline request within 30 days of the request being filed.

**Impact of Change--**This creates certainty as to whether the SBIC can provide the capital to a small business in a timely manner. If SBA turns down the request, the small business may still have time to seek capital from other sources.

- **Investments by Successive SBICs – Timeline for SBA Regulatory Action (Conflict-of-Interest)**

**Background--**SBA limits which small businesses can receive investment if there is a “conflict of interest”(commonly a joint investment between two related funds – for example, Florida SBIC 1

and Florida SBIC 2 both provide capital to the same small business). Many of these conflict of interest limitations are appropriate and should not be changed. However, one form of “conflict of interest” is common and SBA can approve the investment: when two successive SBICs invest into the same company. For example, SBIC 1 and its successor fund SBIC 2 both invest \$1 million into the same business. Since SBIC 1 and SBIC 2 are related (same management team) there is a conflict. SBA is often taking many months to approve or disapprove these “conflict of interest” requests.

**Suggested Change**--SBA should provide a decision (approval or disapproval) of conflict of interest requests within 30 days of the SBIC applying for a conflict waiver.

**Impact of Change**--This creates certainty as to whether the SBIC can provide the capital to a small business in a timely manner. If SBA turns down the request, the small business may still have time to seek capital from other sources.

- ***SBIC License Surrender***

**Background**--SBIC funds have a finite life, generally 10 years. After paying off their leverage, a SBIC winds down and surrender its license. License surrenders used to be processed within a few weeks. Now license surrenders can take 10 or more months. These are unreasonable administrative delays that add unnecessary costs.

**Suggested Change**--SBA should approve or disapprove of a license surrender within 30 days and immediately notify the SBIC of their decision. If disapproved, then SBA must include in the disapproval specifically what the SBIC must do to satisfy terms for surrender.

**Impact of Change**--SBICs can avoid accruing additional expenses for wind down of phantom SBIC funds. There is no downside to the SBA.

- ***Treatment of State University Endowments/Public Pension Funds as Regulatory Capital***

**Background**--SBICs receive investment from their Limited Partners. Some of these Limited Partners are endowments from state-chartered entities (universities and pension funds). SBA has taken the position that since some of these endowments are state-chartered entities and therefore this capital cannot be considered “Regulatory Capital”. This decreases the utility of these entities investing in SBICs and reduces the amount of capital available in the small business economy.

**Suggested Change**--SBA should recognize investment from all universities, pension funds, and other state-chartered entities as regulatory capital.

**Impact of Change**--More capital from these sources would flow to small business via SBIC investment.

- ***SBIC Aggregate Performance Data***

**Background**--SBA does not regularly release aggregate data about the SBIC program. It has been 5 years since SBA released aggregate performance data.

**Suggested Change**--SBA must release to the public updated, current, and aggregated program data no less than bimonthly. SBA should make public aggregate performance data (aggregated by vintage year, investment style, and by levered vs non-levered funds).

**Impact of Change**--This is basic transparency that is produced by other SBA programs more often than required here. Performance data for SBICs is important for those considering investing into the SBIC asset class. All data must be aggregated to prevent the business confidential data of a single fund from being exposed.

- **Affiliation/Portfolio Companies**  
**Background**--Financial regulations of the SBA and SEC were made at different times and sometimes are not in sync, which causes regulatory confusion. One such mismatch—due to laws being created at different times—deals with “affiliation of portfolio companies”. Both SBA and SBICs have concerns that this mismatch may prohibit SBICs from investing alongside conventional investing vehicles at the same time. (Specifically, there is a lack of an exception from affiliation for portfolio companies that are owned by private equity funds exempt from registration under the Investment Company Act of 1940 because of Section 3 (c)(7), which may restrict or harm an SBIC’s investment activities.) This was not intentional and can be corrected easily.  
**Suggested Change**--Update the SBA affiliation rules to create an exemption under the Investment Company Act of 1940 3(c) (7) to marry the Small Business Investment Act.  
**Impact of Change**--This will clarify the law and take away confusion as to whether SBICs can provide capital to small businesses that also receive capital from conventional private equity or venture funds.
- **SBA Release of SBIC Examination Reports**  
**Background**--SBICs are required to be regularly examined by the SBA. SBICs have no control as to when these exams occur, but delays in getting an examination report can paralyze an SBIC from investing, accessing leverage, advancing in the licensing process, or other important regulatory processes.  
**Suggested Change**--SBA must release examination reports to SBICs no later than 4 weeks after completion of the on-sight exam.  
**Impact of Change**--SBICs should be able to receive the results of their examinations in a timely fashion and get back to small business investing.
- **Scheduling Of SBIC Examination**  
**Background**--SBICs are required to be regularly examined by the SBA. SBICs have no control as to when these exams occur, but SBA is using the SBA’s inability or unwillingness to schedule and execute examinations as a means to prevent SBICs from advancing a new license, reserving, additional leverage (that was approved at licensure), or other regulatory actions.  
**Suggested Change**--SBA should be prevented from blocking licensed SBICs from fully operating because SBA has not been willing or able to perform their own examination. Applicants for an SBIC license should not be delayed because SBA has been unwilling or unable to execute the SBA’s examination in a timely fashion.  
**Impact of Change**--SBICs could continue to serve and invest small businesses while SBA gets their examinations system operational.
- **SBIC Aggregate Examination Findings – SBA Summary**  
**Background**--SBA performs examinations on SBICs. SBA releases the number of examinations with findings but does not release any aggregated information about them. If there are common findings in examinations, then it would benefit the SBIC industry to know what they are so that the SBIC industry can make informed improvements in their operations to proactively make corrections.  
**Suggested Change**--SBA should annually release the top ten most common examination findings that were discovered in that year’s examinations.



**Impact of Change--**SBICs would have the information to proactively make corrections and better establish best practices for regulatory compliance. This will make for a better, healthier, and more regulatory compliant small business ecosystem.

- **GAAP Definition of “Tangible Net Worth”**  
**Background--** SBA defines small businesses by measuring “Tangible Net Worth”. SBA does not use the Generally Accepted Accounting Principles (GAAP) definition of this term. In GAAP, Tangible Net Worth is defined as Total Net Worth minus all Intangibles. The SBA defines it as Total Net Worth minus Goodwill. Intellectual property is a critical intangible that SBA also does not recognize. This discourages or prevents investments in companies that are highly innovative, have a lot of intellectual property, or invest heavily in research.  
**Suggested Change--**SBA should use a Tangible Net Worth test that is defined by Generally Accepted Accounting Principles: Tangible Net worth equals Total Net Worth minus All Intangibles (ex: intellectual property/patents, goodwill, contracts, etc.).  
**Impact of Change--**Allows more companies, particularly innovative companies with a great deal of intellectual property, to receive investment. Public policy should not punish companies for doing research and development.
- **Prepayment**  
**Background--**SBICs are prohibited from putting any prepayment restrictions when they invest. There should be a reasonable size restriction because prepayments add administrative burdens to the SBICs. Small business should continue to be allowed to pre-pay investments to SBICs, but SBICs should be allowed to have a reasonable minimum size for prepayments (5% or larger of amount owed) which is a market norm.  
**Suggested Change--**Allow (not require) SBICs to have minimum prepayment sizes of no more than 5% of the outstanding principal.  
**Impact --** This will make it a little easier to administer an SBIC fund.
- **Limited Partner Capital from Bona Fide “Funds of Funds” Should Be Recognized as Institutional Capital**  
**Background--** There are a number of well-established, proven “Funds of Funds” whose investments in SBICs are not treated as institutional regulatory capital. This harms capital inflows into domestic small businesses and does not treat all significant LPs similarly. Well-known and established Funds of Funds with strong bona fides and who meet or exceed the qualifications to be an “institutional investor” should be treated as providers of institutional, regulatory capital. We recognize that a new Fund of Funds might warrant scrutiny and a review, but there are top-tier, long established, SEC-regulated Funds of Funds that are not treated as institutional capital. Further, better treatment of the Funds of Funds model will allow new entities to form to provide professional investment opportunities to unique sources of capital that may need to be pooled to gain the benefits of scale, to access unique market expertise, or to find particularly SBIC characteristics (looking for SBICs that focus on rural areas, for example).

## ii. Licensing Reforms

### • Repeat SBIC Licensees

**Background**--SBA used to provide follow-on licenses to experienced SBIC funds in a much faster fashion than new funds that are unknown to the SBA. Recognizing the record with SBA of repeat SBIC funds used to be an efficient use of SBA resources and allowed SBA to focus on bringing in new funds. The GAO studied repeat SBICs and found them to be much less risk to the taxpayer<sup>5</sup>. Previously licensed SBIC funds have been regulated, examined annually, and have been reporting quarterly to the SBA for years and sometimes decades and are well known to SBA. Treating repeat SBICs as if they are unknown wastes SBA time and resources and provides minimal if any benefit to the SBA. SBA also wastes the time and money of existing SBICs duplicating reporting that SBA already possesses.

**Suggested Change**--SBA should have a real fast-track process for follow-on licenses to SBIC applicants that meet the following criteria:

- Have substantially the same management team with substantially the same investment committee
- Are applying for the same ratio leverage (or less) as their prior fund
- Have substantially the same investment strategy
- Are no more than 50% larger than previous fund
- Have a significant number of Institutional Limited Partners returning from the prior fund (market validation)
- Have no unresolved findings outstanding for prior fund

However, applicant must still be subject to the following:

- New FBI background check
- SBA review of Limited Partner Agreement
- Provision of capital certificates for SBA review
- SBA review of any side letters
- SBA may reject an applicant if licensure would be contrary to public policy or the public interest, but must inform applicant of reason and provide opportunity to cure any issue

This would have several benefits:

- SBA would stop wasting their time and resources.
- SBA would have greater resources to review new SBICs in new areas of the country, new small business investors with unconventional backgrounds, or applying new strategies for new industries.
- Successful SBIC funds would waste less time and money with the licensing process which free them to focus on investing in small businesses.

1. <sup>5</sup> U.S. Government Accountability Office. (2016). *Small Business Investment Companies: Characteristics and Investment Performance of Single and Multiple Licensees*.

- **Bank-Owned SBICs**

**Background**--Some SBICs are "bank-owned". Bank-owned SBICs do not access leverage and therefore there is no financial risk to SBA. Banks forming SBICs are treated like other funds and face years of licensing delays, despite their permanent nature and being subjected to the rest of the banking regulation. By statute, these bank owned SBICs are exempt from the Volcker Rule. Bank-owned SBICs commonly invest in underserved areas. Bank-owned SBICs also can invest equity, which is more "patient capital" than debt. There is always a shortage of equity capital for smaller businesses.

**Suggested Change**--SBA should license non-levered, equity-only, bank-owned SBICs within 30 days of applying, and these funds should not be subject to all the licensing reporting and applications that other SBICs must undertake. The licensing should be automatic subject to several restrictions:

- The bank's name must be in the name of the SBIC.
- The bank must be domiciled in the US.
- The bank must not have had its license revoked or involuntarily surrendered within the past 10 years.
- SBA must approve the Limited Partner Agreement (SBA should produce a standard limited partner agreement for use by banks for immediate approval).

**Impact of Change**--

- More banks would form SBICs in more parts of the country, including serving parts of the country not currently served by SBICs.
- There would be more equity investing in small businesses which produces a high rate of job creation.
- Banks are big enough that they have effective diversity recruiting programs that attract some of the best minorities in finance. Banks could seed the next generation of private equity and venture capital fund managers with a far more diverse talent pool than exists today.
- Banks can use their existing networks to find and provide equity capital to small businesses that otherwise would never be found by venture capital or private equity funds.

- **Non-Leveraged SBICs (Not Bank-Owned)**

**Background**--Some non-levered SBICs are not singularly owned by banks but have a conventional partnership structure and many institutional investors committing capital to the SBIC. These non-levered SBIC funds pose no financial risk to the taxpayer. The venture capital industry has as one of their top priorities allowing venture funds to access bank capital via the Volcker Rule, which venture funds cannot do today. Very few venture funds form as non-levered SBICs because the delays and costs are not worth the protracted effort, cost and the limitations to domestic investment. By removing the licensing delays, reducing the costs of licensing and compliance, and welcoming equity investing SBA can increase the number of venture funds (early stage investors) forming as SBIC funds. This would increase the number of small venture funds (there are very few small venture funds forming, but there are great deal of very large VC funds) and increase the amount of conventional venture capital funds in more states than the three that get almost all of the domestic venture capital investment. SBA should not be making it hard to form a non-levered fund that invests in innovative, early-stage American small businesses.

**Suggested Change**--Applicants for non-levered SBIC funds should be approved for licensure within 90-120 days of applying for a license subject to the following limitations:

- Successfully pass a new FBI background check
- SBA review of Limited Partner Agreement
- Provision of capital certificates for SBA review
- SBA review and approval of any side letters

- Fund managers with findings of serious inappropriate conduct by financial regulators are not part of the fund.
- SBA may reject any applicant for whom the SBA believes it would be against the public interest to license.

**Impact of Change--**

- There is no taxpayer money at risk so the barrier to forming this type of small business investing fund should be lower, but still subject to limitation.
- More SBIC funds could form across the county, including in underserved areas.
- More early stage venture funds can be formed outside of the three states with nearly all the venture capital.
- More equity-oriented funds could form to fill the market gap for small equity.
- More investors that come from non-conventional backgrounds (people who have not been on the investment committee of a venture or private equity fund) could form an SBIC.
- This would liberate SBA resources to reviewing and licensing applicants where there is taxpayer exposure.

• **SBIC License Rejections**

**Background--**SBIC Licensing is a long, complicated, and expensive process. When applicants are turned down for licensure the SBA provides no written explanation and often no clear or meaningful explanation as to why they have made the decision. There is sometimes no opportunity to cure the perceived deficiency that triggered SBA's adverse decision. Further muddying the issues is the fact that the decisions made by SBA are not required to be based on facts in the application record.

**Suggested Change--**SBA should provide clear, specific reasons for rejecting an application. SBA should provide applicants the ability to cure the deficiency identified by SBA. SBA should make their decisions based upon facts in the record.

**Impact of Change--**This is simply a matter of fairness. Spending years forming a fund and spending hundreds of thousands of dollars in the process to be turned down without clarity and a chance to cure is not fair or reasonable.

• **SBIC License Delivery**

**Background--**Applicants for an SBIC license go through a long and expensive licensing process during which most fund managers have no income. Timely processing of licenses is a real financial risk. The last stage of the licensing process is approval by the "Agency Committee". After approval by the Agency Committee, it used to take one week (two at the latest) to receive a license. Now it is commonly taking months and direct Congressional intervention to get the Office of Investment to release approved licenses to the approved applicant.

**Suggested Change--**SBA should transmit a license to applicants within 10 business days of being approved by the Agency Committee for licensure and final action of SBA Administrator.

**Impact of Change--**

- This provides certainty and clarity to SBIC applicants.
- This reduces costs for SBIC applicants.
- There is no added burden to the SBA.

• **"Green-Light" Process for SBIC Repeat Licensees**

**Background--** SBA does not allow anyone to apply for an SBIC license, unless SBA has invited the potential applicant to apply. This invitation to apply is commonly called a "Green Light" or "Go Forth" letter. For funds holding an SBIC license who are regulatory compliant and economically performing and therefore are extremely well-known to the SBA, this "Green Light" process used to take weeks.

Now, getting this Green Light can take a year or longer. It now can take longer to get a “Green Light” for a successful repeat SBIC than it used to take for the Green Light and Licensing processes combined.

**Suggested Change**--For repeat SBIC funds, SBA should decide whether to issue a “Green Light letter” in no less than 20 business days after receiving a request. If the request is turned down, then clear, specific reasons must be provided to the applicant. The applicant must be given the chance to cure the deficiency and reapply immediately.

**Impact of the Change** – This would remove unnecessary delays and costs for both the SBA and the SBIC. Further, this would free up SBA resources to review new entrants into the program.

- ***Timing of Capital Call/SBIC Licensees***

**Background**--SBA requires applicants for a license to call capital from their investors prior to licensure. This makes sense because it confirms the investors are real and can deliver the money they promised. The problem is SBA requires this money to be called before the “Agency Committee” meeting, which means applicants may have investor capital sitting idle for months waiting for the SBA to have the Agency Committee meeting. Making matters worse, if the meeting is delayed or they delay their decision then millions of dollars sitting idle for an even longer period of time. Further, even approved applicants have to wait, sometimes for months, to receive the actual license after Agency Committee approval during which time millions of dollars sit idle. This has the effect of damaging one of the core performance metrics of the fund: IRR (Internal Rate of Return), which artificially lowers the perceived performance of the fund.

Further, if the Agency Committee rejects the application, then capital has been called and must be returned. This causes harm both to the applicant (general partners) and their investors (limited partners). If the applicant is rejected, then they should not have to call capital.

**Suggested Change**--SBA should require capital to be called before an SBIC receives a license, but after being approved by the Agency Committee.

**Impact of Change**--This would maintain protections to SBA and require the validation of the capital commitments to the SBIC while reducing the inadvertent harm to the fund’s IRR performance metric. It also adds a level of fairness to funds that are not approved by the Agency Committee.

### iii. New Proposals

- **SBA – Office of Investment**

**Background**—The SBIC program is a unique, very technical program that promotes long-term small business investing. It takes time to learn the nuances of the program and the very complex venture capital and private equity industry. Also, decisions made by an Associate Administrator will be manifest years later. A revolving door of Associate Administrators is not conducive to consistent policy or with the long-term aspects of the program. Further, an unstable or incompetent appointee can do harm that is far longer lasting than his or her term.

**Suggested Change**—Congress should consider whether the Associate Administrator for the Office of Investment and Innovation should be a career Senior Executive Service position. There would still be political oversight from the Administrator, Deputy Administrator, and General Counsel.

**Impact of Change**—Having competency and long-term continuity for a long-term investing program is prudent public policy and a taxpayer protection.

- **Growth Equity Debentures**

**Background**—Levered SBICs are very limited in the amount of equity they can provide to small businesses because the SBA leverage requires interest payments every six months. Non-levered SBICs can invest more equity, but they do not get the benefit of the capital amplification of the SBIC Debenutres/Leverage. The limitations on equity also limits most SBIC investments to later stage business that have enough cash flow to make interest payments. This also inhibits investments in companies that are pre-revenue or for whom their revenue or profitability is currently too small, despite their growth potential, to make interest payments. SBIC capital is more “patient capital” than is largely available in the small business economy, but SBA should add tools that allow for great access to capital that is even more patient. SBA already has an “LMI Debenture” that is proven to be zero subsidy and allows for more growth equity, but it is geographically constrained and the potential for excess interest fees makes it very unattractive and unknown to most SBICs. Growth Equity is a clear market gap for small businesses that SBIC partly fill but could be better filled with more equity or equity-like tools.

**Suggested Change**—Congress should create a “Growth Equity” Debenture modeled nearly identically on the LMI Debenture with a few differences:

- Should be location agnostic
- Should be accessible to all SBICs
- SBA should not discriminate for or against SBICs as to the mix of Growth Equity or conventional Debentures
- Any excess prepaid interest fees should be counted as payment of principal if the Growth Equity Debenture is paid back early

**Impact of Change**—This will be a useful tool to facilitate investment in growth stage small businesses that can become profitable or bankable within 1-5 years. This will encourage the creation of more small businesses in their earlier stages (but not “bleeding edge” startups).

- **Early Stage SBICs**

**Background**--SBA recently ran a pilot program to facilitate earlier stage investing for the SBIC program. Only 5 "early stage" SBICs were licensed. These funds were successful and maintained the zero subsidy. SBA let the regulations lapse that allowed the program to license and operate, but these could (and should be reinstated) very quickly.

The only change needed is move to rolling licensing instead of licensing only once a year. With a single licensing period there is no room for any changes or back and forth with SBA -- either you are a perfect fit at that moment in time, or you have to be out of the market for a year and try again, which does not work. Also, the singular licensing deadline requires a bit of luck that the fund in formation's lifecycle has to coincide with an arbitrary SBA date.

**Suggested Change**--Reinstate Early Stage SBIC program with rolling licensing.

**Impact of Change**--This can immediately create an earlier stage platform for SBICs that has already been tested and proven to be successful.

- **Opportunity Zone SBICs**

**Background**--Opportunity Zones create a powerful incentive to bring investment and prosperity to underserved communities. The tax law is more geared toward real estate investing and not job-creating small business investing. Creating branded "Opportunity Zone SBICs" would allow and encourage more small business investing in these zones in a way that is regulated to protect both the small business and the investors into the SBIC fund. It is also worth noting, that because of the way SBICs are regulated, SBIC investment affords small businesses protections and benefits that they would not have from the broader investing market (FBI background checks on fund managers, limits on interest rates that can be charged, etc.).

**Suggested Change**--SBA can license "Opportunity Zone SBICs" that invest exclusively or primarily (75% or more) in Opportunity Zones. These SBICs should not be limited by SBA to invest a single Opportunity Zone. Per existing tax law, only investments in Opportunity Zones would qualify for OZ tax benefits.

**Impact of Change**--Get more capital into small businesses that create ongoing jobs in economically disadvantaged communities (not just one-time, construction-related jobs).

Rather than trying to "retrofit" the current opportunity zone structure, which is better suited for real estate investments, this approach would utilize the existing SBIC program (with its 60+ year history) that was explicitly created for small business investing.

Leverage existing infrastructure of the SBIC program to vet and qualify appropriate funds and their strategies and provide ongoing monitoring and evaluation.

- **Bonus Leverage to Shrink Market Gaps**

**Background**--The government wants to encourage more small business investing in some specific areas, but the government cannot direct investment and should not mandate these investments. However, the government can create an incentive, without subsidies or additional risk to the taxpayer, to invest in these targeted areas.

"Bonus leverage" would exempt from the leverage limits investments that meet specific criteria. The ratio of private capital to SBA leverage must be maintained at 2:1 or less. This would create an

incentive to proactively look at smaller business opportunities that are in low income areas, manufacturing, veteran-owned, or other targets. SBICs would still only invest or decline investment on economic terms, but SBIC would be able to invest more capital if they are able to find promising businesses in the targeted categories.

**Suggested Change**--Bonus leverage for investments in smaller enterprises that are in: veteran owned businesses; opportunity zones; defense priority industries; advanced manufacturing; LMI areas; women-owned businesses, minority-owned businesses, etc.

**Impact of Change**--Creates a zero-cost, market-driven incentive to encourage SBICs to seek out investment opportunities in smaller businesses that are in: smaller businesses, underserved areas; advanced manufacturing; etc., without a subsidy.

- **Venture SBIC Program**

**Background**--SBIC previously had a version of the SBIC program that was extraordinarily good at facilitating investment in early stage American businesses. However, it had several, very easily addressed flaws that should be corrected legislatively to protect the taxpayer and enhance investment in innovative early-stage companies. Further, foreign countries are actively investing in their early stage companies and the United States does not have a coherent policy to ensure American entrepreneurs have similar access to capital. There are also concerns that some countries, China in particular, appear to be investing in early stage American companies as part of their economic and espionage efforts (see chart and commentary from Politico article titled "How China Acquires "the Crown Jewels" of U.S. Technology below). The United States should be deliberately and thoughtfully fostering domestic private investment in earlier stage businesses.

**Suggested Change**--

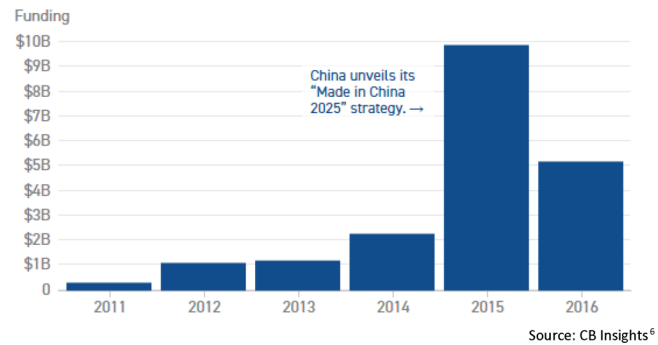
- Congress could reform the Participating Securities SBIC platform that was early stage focused and last license a fund in 2004.
- Limit Leverage to Participating Securities SBICs to a ratio of 1:1 private capital to SBIC leverage. Internal SBA studies found that had SBA had a leverage ratio of just less than 2:1 then the previous early stage focused SBIC program (1994-2004) would have fully paid back the government. For early stage investing a ratio of 1:1 leverage would be far safer than the 2:1 used for the Participating Securities SBIC program.
- SBA should streamline the payback model used to make sure the SBA gets paid back *pari passu* (at the same time and proportion as the LPs) until all principal and interest are paid back to the government. The old model effectively had the taxpayer paid back last and in a very complicated manner, which was a poor policy
- After SBA has been fully paid back all the leverage that was borrowed, then SBA would receive distributions at a lower rate (1:4) of all remaining distributions to LPs and GPs. This keeps the financial incentives for Institutional Investors to invest in these funds, but also allows a level of profit participation to cover any potential losses in the highly variable early stage investing market.



Figure 4:

**Money invested in U.S. tech from China region**

Investments from the Greater China Region (China, Hong Kong, Taiwan) to U.S. tech companies skyrocketed from \$2.3 billion in 2014 to \$9.9 billion in 2015, though they fell in 2016.



<sup>6</sup> Chart and comment take from Politico 5/22/2018 How China acquires 'the crown jewels' of U.S. technology"  
[www.politico.com/story/2018/05/22/china-us-tech-companies-cfius-572413](http://www.politico.com/story/2018/05/22/china-us-tech-companies-cfius-572413)

## Section Three

## Serious Mismanagement Issues Undercutting the Effectiveness of the SBIC Program

For the past two years SBICs have been unable to determine whether the leadership of the Office of Investment and Innovation is just ineffectual or hostile to the existence and operation of this small business program. It is the consensus view of the small business investors that it is both.

Small Business Investment Companies need and want regulations that are reasonable, clear, predictable, and maintain the alignment of interests between the private and public sectors. However, small business investors see a pattern of mismanagement by OII leadership using or warping the regulations not for good faith execution of the law and the benefit of small business, but instead to set up a near never-ending series of delays, roadblocks, and unnecessary costs at every step of the program. Every process with which the Associate Administrator is involved has become slowed, erratic, and unpredictable. When there is any regulatory or procedural question small business investors now are forced to assume that the most adverse interpretation is the likely outcome.

With reasonable regulation and effective management, the SBIC program can serve many more small businesses. The SBIC program is a long-term platform and the successes for the past several years and the current year are lagging indicators. For example, the majority of licenses issued and the small businesses receiving capital are largely the results from the previous management of the Office of Investment. The leading indicators are the result of the current leadership of the SBIC program and are trending very negatively. With the current program management of this otherwise successful small business program, the amount of small business investment is on a downward path where the future will have fewer small business funds with fewer small businesses able to access capital. This mismanagement is also creating unnecessary risk to the taxpayer.

In some cases, the SBIC processes work adequately and as they should, but in too many other cases random delays and unpredictable outcomes have been the growing norm. There are numerous, interdependent steps in the many SBIC processes. The regulatory steps that do not involve the Associate Administrator generally seem to be working adequately. Nearly all processes involving the Associate Administrator are delayed, commonly for exceedingly long periods of time. Since many processes have multiple steps, the delays build upon other delays and to the point of near programmatic dysfunction. Regulation of a \$30 Billion dollar small business program should not be so unpredictable and unsteady.

- **SBIC Program Only Works When There is Impending Oversight.** Without public review and Congressional oversight, the current leadership of the SBIC program will not let the SBIC program operate effectively or efficiently, but when there could be public scrutiny the program is allowed to work (albeit only until the threat of oversight wanes).
  - The first licenses for fiscal year 2019 were issued less than 24 hours before the SBA Administrator was scheduled to testify before the Senate Small Business Committee in February 2019.
  - In the closing months of FY 2018 the rate of Debenture licenses issued dramatically accelerated in advance of the SBA Administrator speaking to a large gathering of small business investors.
  - A SBIC license was only delivered to the applicant, who had been waiting months for the license documents, when OII was informed that the Administrator was going to be appearing with the home state Senator of the applicant.
  - After waiting for an extended period of time for an approved license to be sent, it was emailed an hour after a Senate office was forced filled out SBA's required paperwork before the SBA would talk to the Senate office about the reason for the delays.
  - Several Representatives had to intervene with SBA to get the OII to release the approved licenses of their constituents after months of delays.
  - Senators and Representatives should not have to personally involve themselves in the SBA operations to get the leadership of the Office of Investment and Innovation to his job.
  - The small business investing community expects that a number of the metrics for the SBIC program will noticeably improve just prior to this Congressional hearing – only because of this hearing. However, the small business investing community also expects that shortly after any Congressional oversight of the SBIC program, the current leadership of the Office of Investment and Innovation will quickly return the program to near dysfunction.
- **Undercutting the Implementation of Chairman Rubio's "Spurring Business in Communities Act".** A new law sponsored by Chairman Rubio requires SBA to prioritize licensing small business investment funds in states and regions where there are too few. The Associate Administrator's response to this law has been to gut the staff charged with fulfilling this statutory mandate.
  - The Program Development team had four (4) FTE's prior to the law being signed. This team was responsible for outreach to underserved areas and to educate the small business investing community about how to amplify small business investment by accessing this program.
  - Since the law's enactment, the Associate Administrator has reassigned the people on the team and reduced it to one person: The Director of Program Development. The program's data tells the story. Instead of increasing licensing in underserved states, the number of applicants entering the licensing pipeline has dropped precipitously. Rather

than growing the program, it appears that the Associate Administrator's model for achieving small business investor parity between the states is apparently to stunt SBIC growth for all the states.

- OII has not released guidance on the implementation of this Act nor proposed regulations.

Figure 5:

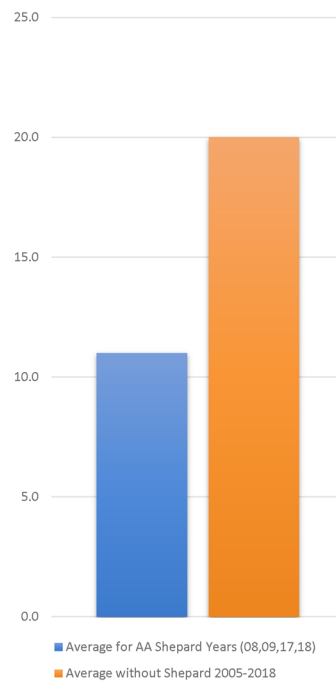
<b>Program Development and Licensing Activity</b> <b>Applicant Initial Review/Program Development</b> <b>SBA Data through March 31, 2019</b>						
SBA'S REPORTED DATA AS OF 3/31/2019						YEAR OVER YEAR CHANGE
	FY 2015	FY 2016	FY 2017	FY 2018 (FIRST FULL FY WITH AA SHEPARD)	FY 2019 (HALF FY YEAR, THRU 3/31/19)	3/31/2018 VS 3/31/2019
<b>Total Received During FY</b>	48	57	55	39	11	(45%)
<b>1<sup>st</sup> Time SBIC Applicants</b>	24	30	27	17	5	(44%)
<b>Subsequent Fund Applicant</b>	24	27	28	22	6	(45%)
<b>Processed in FY</b>	44	50	52	41	9	(50%)
<b>Green Light Letters Issued</b>	25	32	31	28	7	(42%)

- **Faux-Outreach to the Small Business Investor Community.** Under the Associate Administrator's management taxpayer money has been spent to do "outreach" that has been so badly handled that is at best ineffective and has built a paper trail of faux outreach with no follow up:
  - The Associate Administrator was so disorganized and late in organizing an "outreach" event in New York that there were only eight attendees – four from SBA and three were asked by SBA to be there on the SBA's panel – one independent attendee.
  - On October 17, 2018, the Associate Administrator held an SBIC rural investing outreach seminar the morning after the SBIC community's annual event over 700 hundred miles away, ensuring minimal participation from SBICs who want to invest in rural areas.
  - On May 21, 2019, the Associate Administrator held an SBIC event in Maine. The only SBIC in Maine was disinvited by SBA from attending.

- The OII held three SBIC “Listening Sessions” in 2018. Taxpayers funded mediators to facilitate discussions that have been held for decades directly between SBA and the private sector without intermediaries. There has been no follow up or improvements stemming from these sessions. The private sector put a good deal of effort in preparing constructive input to SBA, but it appears that these events created a paper record of engagement without any outcome or improvement.
- The Associate Administrator has stated he will not participate in any forum where he has not pre-screened all the questions and removed any substantive questions. This communications approach has been received poorly by small business investors, the institutional investors that provide the provide capital into SBICs, and those considering forming a new SBIC fund. Further, because of the hollowing out of the Program Development Team, there is effectively no follow up to the check-the-box outreach that has occurred, ensuring minimal positive impact.
- **Refusal to Share with Congress Taxpayer Funded Reports on the SBIC Program.** The taxpayers paid for three (3) in-depth studies of the SBIC program by the Library of Congress in conjunction with academics from Duke and Pepperdine University’s business schools. Two of these studies were released during the prior Administration.
  - The final Library of Congress study on the impact of the SBIC program on the health of the private small business capital market has been blocked from release by the Associate Administrator, despite being completed.
  - The House Small Business Committee asked for this completed report, but the Associate Administrator has blocked the sharing of the report with the Committee. As the Committee is reauthorizing the SBIC program it is owed full access to all studies on the SBIC program so it can make informed decisions. Further, it is unclear how a single office in an executive branch agency is able to block Congress’ own Library of Congress from sharing its research with the authorizing committees of the House and Senate.
  - It is also worth noting that the Senate Small Business Committee submitted numerous questions for the record to the SBA about the SBIC program following a February 2019 hearing with then-SBA Administrator McMahon. Four months later, it appears the SBA has still not responded with answers to all the Senate Committee’s questions about the SBIC program.
  - The Associate Administrator has also blocked the release of the SBA’s annual reports for the SBIC program for FY 2015 and FY 2016, which are both completed. There are no annual reports expected for FY 2017 or FY 2018.
  - The SBA has hired dozens of contractors to do studies and work on projects related to the SBIC program. While some of them are likely valid, value-producing work, none of these studies have been shared with the public or the committees.

- **License Surrenders.** SBICs have a finite life of about 10-12 years. As the SBIC fund winds down it pays off all money owed to the SBA, including fees and leverage. Once the SBA is fully paid off, then the SBIC surrenders its license and ceases to be an SBIC. Prior to the current management, a surrender was a pro forma exercise which was uniformly accepted and processed in a matter of days.
  - Under the current management SBICs are being forced to wait as long as 10 months for the Associate Administrator to approve license surrenders.
  - During these periods of unreasonable administrative delays, forms must be filed, examinations may be required, and as results SBICs are bearing unnecessary costs and their other active SBICs can face unnecessary delays or barriers to reserving leverage for prospective investments or advancing an application for a new SBIC licenses.
  - There is no statutory or regulatory reason for these excessive periods of inaction by the Associate Administrator. (See the letters dated April 18, 2019 and May 8, 2019 to the SBA regarding this issue in the appendix to this testimony.) It appears that license surrenders might be delayed until a new license is issued to make the reported data artificially appear to reflect that the number of small business investment funds is stable and not declining.
- **Receiving License After Approval.** By statute and regulations, SBICs are not legally licensed and very restricted in their ability to invest in small businesses until they have a license in their possession, either digital or paper from the SBA. Applicants for an SBIC license go through a rigorous, multistep vetting process. The last vetting is performed by the SBA's "Agency Committee". Prior to current management, the period from approval by the Agency Committee to receiving a license number ranged from 0 to 10 business days. The period to receive a license number now regularly takes months. There is no reasonable justification for these delays. These delays appear to be caused by several actions/inactions by the Associate Administrator.
  - The Associate Administrator sometimes will not send a license until he has found time on his calendar to personally call the applicant to tell them that they have been licensed. This can take over a month to receive this unnecessary call. In some cases funds have received a call that they were licensed and then were unsure if they were able to legally operate because they did not receive anything in writing for a very long time. A phone call is not a license to operate a multimillion dollar fund.
  - An additional source of delays is the inability of the Associate Administrator to submit the paperwork with all the approvals for processing in a timely manner. SBICs and SBA staff have expressed concerns about backdating of documents. It is worthy of investigation by either the Small Business Committees or the Inspector General as to whether the Associate Administrator has been withholding signed documents or backdating the documents or approvals to misrepresent or redirect the culpability for these delays.
  - Finally, on numerous occasions it has taken the direct intervention by Members of Congress for the Associate Administrator to release the approved licenses, after extensive delays. (See letters in the appendix to this testimony dated August 10, 2018, February 7, 2019, and February 27, 2019 to SBA and to the Committee regarding these delays.)

Figure 6:

**Comparison of SBIC Licensing of  
Current Management and Historical Norms****Average SBIC Levered  
Licenses Per Year  
FY 2005-2018**

- **Green Light Letters.** The first major step in the licensing process is receiving a “Green Light” letter inviting the applicant to apply for a SBIC license subject to meeting or exceeding several SBA-determined criteria.
  - For existing SBIC funds forming a new small business fund, the Green Light process used to take several weeks because the SBA already has detailed performance and regulatory information about the applicant. This process can now take over a year.
  - The Associate Administrator has inserted a series of new unnecessary delays that have severely slowed the formation of more SBIC funds. For example, repeat funds seeking subsequent licenses face unnecessary hurdles and delays despite the SBIC having been in the program for years and the SBA having extensive knowledge of their operations. Repeat SBIC funds are subject to examination delays that can exceed those experienced by first time applicants. Repeat funds must travel to Washington to be re-interviewed at the sole scheduling discretion of the Associate Administrator, which can add months of delay. Prior to the current Associate Administrator, decisions on “Green Lights” would occur shortly after any interview. It now can take several months after the interview to receive the “Green Light” decision.
  - The current Associate Administrator is not only wasting taxpayer money and small business investors’ time with these Green Light delays for repeat small business investors, but these new practices are absorbing finite resources that should be deployed to expand the program such as fulfilling Chairman Rubio’s *Spurring Business in Communities Act*. By statute SBA should be directing its energies to adding more small business investment companies in more parts of the country to gain more small business investment parity.

Figure 7:

SBA’S REPORTED DATA AS OF 3/31/2019						YEAR OVER YEAR CHANGE 3/31/2018 VS 3/31/2019
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019 THRU 3/31/2019	
<b>Green Light Letters Issued</b>	25	32	31	28	7	<b>(42%)</b>



- **Examinations as a Delaying Tool, not as Compliance Tool.** By statute SBA must examine SBIC funds for regulatory compliance. These examinations are in addition to the normal independent audits performed annually on SBIC funds.
  - Beginning with the current Associate Administrator the examinations process has been used as a tool to insert delays into nearly every core SBIC operation (e.g., licensing, accessing leverage, normal regulatory approvals, surrendering licenses).
  - It is critical to note that the delays that have been created are not because examinations found a violation, but because 1) the Associate Administrator created new arbitrary timelines completely outside the control of the SBICs; 2) SBA could not schedule an examination in a timely fashion (SBICs have no control over when these exams occur); 3) SBA could not finalize the examination in a timely fashion; 4) The SBA was unable or unwilling to transmit the results to the fund; or 5) the Associate Administrator has inserted himself into the examinations process and the release of the examination to the SBICs adding further delays. Examinations should be used to monitor regulatory compliance.
  - The Associate Administrator has repeatedly misrepresented the issue by accusing SBICs of not being in examination compliance for examinations. The timing issues and the processing of examinations are solely under the Associate Administrator's control.
  - Even after completing examinations, it now can take up to six months or longer for SBA to share the examination report with the SBICs, during which time the SBIC is frozen regulatorily and unable to reserve investment leverage or submit a license application.
  - The precipitous drop off in leverage reserved (a measure of future small business investing) and in funds forming is in part due to the misuse of the examination regime. According to SBA's most recent year-to-date data, there has been a 31% drop in the amount of leverage issued/reserved - \$690.6 million. If OII continues to stifle SBICs from reserving leverage for the rest of the fiscal year, the results will be a reduction in leverage issued of over just over \$1.1 billion, indicating a reduction in future small business investment by about \$1.6 billion (assuming 2:1 leverage ratio).

Figure 8:

Debenture Leverage Issued – SBA Data as of March 31, 2019

SBA'S REPORTED DATA AS OF 3/31/2019						YEAR OVER YEAR CHANGE 3/31/2018 VS 3/31/2019
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019 PARTIAL THRU 3/31/2019	
<b>Leverage Commitments Issued</b>	\$2,553	\$2,514	\$1,960	\$2522	\$690	<b>(31%)</b>

- **Licensing Interviews.** Applicants for an SBIC license are being required to come to Washington for a personal interview, even repeat SBICs. Applicants are very willing to come in for interviews. However, the Associate Administrator commonly will not schedule the required interview for months – adding unnecessary delays on top of the already unnecessary other delays.
  - The SBIC licensing process is a complicated legal process that is alien to most small business investors who are experts in growing small businesses, not navigating the federal regulatory gauntlet. As is their right, small business investors use legal/regulatory counsel to help them prepare their applications and to serve as a translator to better understand the government’s questions and statements.
    - The Associate Administrator has made it clear that he disapproves of applicants having regulatory counsel present in meetings between the SBA and the applicant. Fund managers report that the Associate Administrator has even walked out of such interviews if counsel is present, but he then adds delays to the process with subsequent questions that he could have asked if present or if the applicant’s previously submitted materials had been read.
    - The Associate Administrator asks for post interview materials after almost all interviews, much of which were already in the application, but in a different form. This causes an additional delays.
    - In some cases, the Associate Administrator has asked to meet privately with applicants without counsel or other SBA staff present, which is not only inappropriate but effectively an offer that applicants cannot refuse without risking additional delays and an adverse decision by the Associate Administrator.
- **Timing of Regulatory Responses.** Many regulatory decisions are time sensitive with serious ramifications for small businesses, their employees, and the SBICs. SBA must make an informed decision so that SBICs can know how they are allowed to help small businesses. But, instead of making timely informed decisions, matters involving the Associated Administrator often are so delayed, creating impossible situations for the SBIC and their portfolio companies.
  - For example, SBICs have been faced with the choice of saving a small business and the jobs it provides or violate the regulations because the leadership of OII has been unable to decide when to approve a regulatory request in a reasonable time.
- **Refusal to Allow the Office of Investment to Fulfill its Mission by Refusing to Hire.** The Office of Investment and Innovation oversees nearly \$30 billion dollars of domestic investment with approximately 88 staff positions. This office has been operating without nearly 20% of its workforce with approximately 17 vacant positions because the Associate Administrator will not approve filling the vacant positions. Many of these positions are mission critical, senior management positions that have been vacant for over two years.
  - Vacancies in these positions are causing significant increases in risk to the taxpayer.

- Some of the vacant leadership positions include: Deputy Associate Administrator (the most senior career management position in the office, Director of Licensing, and two Operations Chiefs (there are only 3 total Operations Chiefs and these staff oversee the regulation and operations of \$30 billion dollars).
- **Inability to Execute Basic Program Operations.** According to the SBA's published Standard Operating Procedures, an applicant for an SBIC license will not be issued a license until after the management team has attended an SBIC Regulations class taught by the SBA. For decades these classes have been held at least once a quarter and sometimes more often. However, the SBA has not held any SBIC Regulations classes in 2019 and none are scheduled. The last SBIC Regulations Class was held on November 29, 2018, more than seven months ago.
  - The OII, at the direction of the Associate Administrator, has provided conflicting and inconsistent guidance as to why SBA is not able to hold these classes and what the plan is going forward.
  - To the private sector this appears to be one more step in the SBIC process that has collapsed due to mismanagement.
- **Inability or Unwillingness to Communicate Effectively with the SBIC Licensees.** Communication is critical in a complicated, highly regulated program like the SBIC program. The communications from OII are minimal and often not informative.
  - For example, the OII informed SBICs that because of the January 2019 shutdown it would delay by one month the due date for certain required filings. However, shortly before the original deadline some funds were informed that the delay was revoked, and they must file their forms by the original deadline. But, shortly after this revocation and without explanation, OII disabled the computer systems for an extended period that allowed SBICs to file their required forms. This made it nearly impossible to comply with these moving deadlines. There was no communication about OII taking the computer system down or when it would reopen. Once the computer system was finally opened up, SBA directed SBICs to wake up and log in at 3:00 am in the morning to access SBA's computer system. The extension date was for a Sunday, initially leaving SBICs unclear as to whether the real deadline was the previous Friday or the following Monday.

## Section Four

## Appendices

Letters Submitted; Studies and Reports; and  
SBIC Data

**Small Business Investment Company (SBIC) Program Overview**  
as of March 31, 2019

<b>PROGRAM COMPOSITION</b>					
<b>Program Composition of Operating SBICs</b>					
	<b>FY End 2015</b>	<b>FY End 2016</b>	<b>FY End 2017</b>	<b>FY End 2018</b>	<b>as of 03/31/19</b>
<b>Total Number of Licensees</b>	303	313	315	305	304
Debenture	205	216	227	227	227
Participating Security	46	41	33	25	23
Bank-Owned/Non-Leveraged	43	47	47	47	48
Specialized SBICs	9	9	8	6	6
<b>Private Capital of Operating SBICs by Fund Type (\$ in millions)</b>					
<b>a. Regulatory Private Capital</b>	<b>\$12,995.0</b>	<b>\$14,115.3</b>	<b>\$15,014.7</b>	<b>\$15,808.2</b>	<b>\$16,203.3</b>
Debenture	10,414.2	11,357.7	12,259.3	13,252.8	13,234.2
Participating Security	887.8	716.8	504.6	352.3	340.7
Other	1,693.0	2,040.8	2,250.8	2,203.1	2,628.5
<b>b. Leverageable Private Capital</b>	<b>\$ 7,930.5</b>	<b>\$ 8,897.1</b>	<b>\$9,565.1</b>	<b>\$10,015.0</b>	<b>\$10,167.9</b>
Debenture	6,413.4	7,309.8	7,974.6	8,533.4	8,638.1
Participating Security	684.7	571.1	383.5	262.5	250.9
Other	832.4	1,015.5	1,207.1	1,219.1	1,278.8
<b>c. Unfunded Private Commitments</b>	<b>\$5,064.4</b>	<b>\$ 5,218.2</b>	<b>\$5,449.6</b>	<b>\$ 5,793.1</b>	<b>\$6,035.5</b>
Debenture	4,000.8	4,047.9	4,284.8	4,719.4	4,596.1
Participating Security	203.1	145.0	121.2	89.8	89.8
Other	860.6	1,025.3	1,043.7	983.9	1,349.6
<b>Leverage from SBA of Operating SBICs by Fund Type (\$ in millions)</b>					
<b>d. SBA Capital at Risk (e+f)</b>	<b>\$12,351.2</b>	<b>\$13,696.7</b>	<b>\$13,996.5</b>	<b>\$14,280.7</b>	<b>\$13,887.1</b>
Debenture	11,883.6	13,356.3	13,810.2	14,203.4	13,838.1
Participating Security	392.6	249.5	96.8	18.0	5.8
Other	75.0	90.9	89.4	59.3	43.2
<b>e. Outstanding SBA Leverage</b>	<b>\$ 9,157.2</b>	<b>\$10,330.4</b>	<b>\$10,708.9</b>	<b>\$10,860.5</b>	<b>\$10,829.5</b>
Debenture	8,712.0	10,010.8	10,525.3	10,785.8	10,783.1
Participating Security	384.6	244.6	96.8	18.0	5.8
Other	60.6	75.0	86.8	56.7	40.6
<b>f. Outstanding SBA Commitments</b>	<b>\$ 3,194.0</b>	<b>\$3,366.3</b>	<b>\$3,287.6</b>	<b>\$3,420.2</b>	<b>\$3,057.6</b>
Debenture	3,171.6	3,345.5	3,285.0	3,417.6	3,055.0
Participating Security	8.0	4.9	0.0	0.0	0.0
Other	14.4	15.9	2.6	2.6	2.6
<b>g. Unreimbursed Prioritized Payments</b>	<b>\$142.2</b>	<b>\$113.1</b>	<b>\$55.5</b>	<b>\$0.1</b>	<b>\$0.0</b>
<b>Combined Private Capital and SBA Capital at Risk of Operating SBICs (\$ in millions)</b>					
<b>h. Total Capital at Risk (a+d)</b>	<b>\$25,346.1</b>	<b>\$27,812.0</b>	<b>\$29,011.2</b>	<b>\$30,088.8</b>	<b>\$30,090.4</b>
Debenture	22,297.8	24,714.0	26,069.5	27,456.2	27,072.2
Participating Security	1,280.4	966.3	601.5	370.3	346.5
Other	1,768.0	2,131.7	2,340.2	2,262.4	2,671.7

**Small Business Investment Company (SBIC) Program Overview**  
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Program Composition in Liquidation (\$ in Millions)					
	FY End 2015	FY End 2016	FY End 2017	FY End 2018	as of 03/31/19
<b>Total Number of Licensees</b>	115	104	97	87	87
Participating Security	81	76	72	66	66
Other	34	28	25	21	21
<b>Leverage Balance</b>	\$959.2	\$810.5	\$671.7	\$413.1	\$419.5
Participating Security	697.5	571.1	451.8	257.1	253.3
Other	261.7	239.4	219.9	156.0	166.2
Program Funding (\$ in millions)					
<b>Debtenture Authorization (\$ in Millions)</b>	<b>\$4,000.0</b>	<b>\$4,000.0</b>	<b>\$4,000.0</b>	<b>\$4,000.0</b>	<b>\$4,000.0</b>
<i>Annual Charge</i>	0.742%	0.672%	0.347%	0.222%	0.094%
<i>Average Debtenture Pooled Interest Rate</i>	2.68%	2.29%	2.70%	3.35%	N/A

ECONOMIC IMPACT: SBIC FINANCINGS TO SMALL BUSINESS REPORTED *						
Total SBIC Program						
	FY End 2015	FY End 2016	FY End 2017	FY End 2018	as of 03/31/19	Chg. from 03/31/18
<b>Financing Amount Reported (\$ in millions)</b>	\$6,285.5	\$5,991.7	\$5,727.3	\$5,502.6	\$2,887.2	14%
<b>Type of Financing (\$ in millions)</b>						
Straight Debt	3,810.5	3,791.7	3,720.2	3,543.0	1,799.8	5%
Debt with Equity Features	1,351.2	1,157.1	859.8	807.3	405.2	23%
Equity Only	1,124.8	1,042.9	1,147.4	1,152.2	682.1	35%
<b>Number of Companies Financed</b>	1,210	1,201	1,077	1,151	701	13%
<b>Special Competitive Opportunity Gap</b>	288	332	308	315	170	16%
Businesses Located in LMI Areas*	229	284	262	265	142	25%
Women, Minority, Veteran Owned*	73	61	68	66	36	(14%)
<b>Number of Jobs Created or Sustained**</b>	129,749	122,382	112,865	106,021	55,672	8%
Debtenture SBICs						
<b>Financing Amount Reported (\$ in millions)</b>	\$5,939.6	\$5,653.8	\$5,353.8	\$5,159.0	\$2,641.9	9%
<b>Type of Financing (\$ in millions)</b>						
Straight Debt	3,701.8	3,665.5	3,617.6	3,422.1	1,737.5	4%
Debt with Equity Features	1,265.9	1,110.6	835.4	791.8	388.3	19%
Equity Only	971.9	877.7	900.9	945.0	516.1	21%
<b>Number of Companies Financed</b>	1,010	986	904	940	586	14%
<b>Special Competitive Opportunity Gap</b>	226	260	245	238	142	30%
Businesses Located in LMI Areas*	182	232	212	206	117	34%
Women, Minority, Veteran Owned*	51	35	47	39	31	15%

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<b>Number of Jobs Created or Sustained**</b>	122,608	115,481	105,505	99,400	50,943	4%
<b>Non-Leveraged, Bank-Owned, and Specialized SBICs</b>						
	<b>FY End 2015</b>	<b>FY End 2016</b>	<b>FY End 2017</b>	<b>FY End 2018</b>	<b>as of 03/31/19</b>	<b>Chg. from 03/31/18</b>
<b>Financing Amount Reported (\$ in millions)</b>	<b>\$300.1</b>	<b>\$307.0</b>	<b>\$357.7</b>	<b>\$328.0</b>	<b>\$228.6</b>	<b>102%</b>
Type of Financing (\$ in millions)						
Straight Debt	98.8	116.5	94.1	111.9	56.6	80%
Debt with Equity Features	72.6	38.2	23.4	13.4	15.5	216%
Equity Only	128.8	152.3	240.1	202.6	156.5	103%
<b>Number of Companies Financed</b>	<b>147</b>	<b>203</b>	<b>189</b>	<b>236</b>	<b>129</b>	<b>10%</b>
<b>Special Competitive Opportunity Gap</b>	<b>48</b>	<b>70</b>	<b>67</b>	<b>84</b>	<b>32</b>	<b>(18%)</b>
Businesses Located in LMI Areas*	34	50	54	66	29	0%
Women, Minority, Veteran Owned*	21	26	22	27	5	(67%)
<b>Number of Jobs Created or Sustained**</b>	<b>6,196</b>	<b>6,271</b>	<b>7,048</b>	<b>6,319</b>	<b>4,408</b>	<b>99%</b>
<b>Participating Security SBICs</b>						
<b>Financing Amount Reported (\$ in millions)</b>	<b>\$46.8</b>	<b>\$30.9</b>	<b>\$15.8</b>	<b>\$15.7</b>	<b>\$16.7</b>	<b>114%</b>
Type of Financing (\$ in millions)						
Straight Debt	9.9	9.7	8.6	9.0	5.7	16%
Debt with Equity Features	12.8	8.3	0.9	2.0	1.5	1400%
Equity Only	24.1	12.9	6.3	4.6	9.5	252%
<b>Number of Companies Financed</b>	<b>53</b>	<b>40</b>	<b>23</b>	<b>15</b>	<b>10</b>	<b>25%</b>
<b>Special Competitive Opportunity Gap</b>	<b>14</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>0%</b>
Businesses Located in LMI Areas*	13	9	6	3	1	0%
Women, Minority, Veteran Owned*	1	0	0	0	0	0%
<b>Number of Jobs Created or Sustained**</b>	<b>945</b>	<b>630</b>	<b>312</b>	<b>302</b>	<b>321</b>	<b>104%</b>
<b>PROGRAM OFFICE ACTIVITIES</b>						
<b>New Licensees</b>						
<b>New Licensees by Fund Type</b>	<b>25</b>	<b>21</b>	<b>15</b>	<b>25</b>	<b>5</b>	<b>(55%)</b>
Debenture	22	17	11	21	3	(67%)
Bank-Owned/Non-Leveraged	3	4	4	4	2	0%
<b>Initial Private Capital (\$ in millions)</b>	<b>\$1,236.4</b>	<b>\$1,188.0</b>	<b>\$831.7</b>	<b>\$1,224.2</b>	<b>\$490.1</b>	<b>(12%)</b>
Debenture	1,204.1	893.0	656.5	1,137.9	252.5	(47%)
Bank-Owned/Non-Leveraged	32.3	295.0	175.2	86.2	237.6	213%

\* The Office of Investment and Innovation reports financing information based on data collected on the SBA Form 1031. Information is aggregated, by fiscal year, based on the date of the submission of the form and not on the date of the financing to the small business.

\*\* SBA estimates jobs created or sustained using "The 1999 Arizona Venture Capital Impact Study" (confirmed by the DRI-WEFA study of 2001) indicating that 1 job is created for every \$36,000 of SBIC Program investment (adjusted for inflation).

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Licensing Pipeline *						
	FY End 2015	FY End 2016	FY End 2017	FY End 2018	as of 03/31/19	Chg. from 03/31/18
<b>Total in Pipeline</b>	37	49	62	53	53	(12%)
In Applicant Review/Program Development	13	20	22	20	22	(8%)
In Capital Raising	14	22	26	23	21	5%
In Licensing	10	7	14	10	10	(38%)

Program Development and Licensing Activity **						
<b>Applicant Initial Review/Program Development</b>						
<b>Received during FY</b>	48	57	55	39	11	(45%)
1st Time SBIC Applicants	24	30	27	17	5	(44%)
Subsequent Fund Applicants	24	27	28	22	6	(45%)
<b>Processed in FY</b>	44	50	52	41	9	(50%)
<b>Green Light Letters Issued</b>	25	32	31	28	7	(42%)
<i>% of Processed Receiving Green Light</i>	57%	64%	60%	68%	78%	16%
1st Time SBIC Applicants	11	10	18	10	4	0%
Subsequent Fund Applicants	14	22	13	18	3	(63%)
Number Denied -- 1st Time and Subsequent	17	15	15	7	2	0%
Number Withdrawn -- 1st Time and Subsequent	2	3	6	6	0	(100%)

<b>Capital Raising Completed/Terminated</b>						
<b>Green Light Letters Expired/Other Licensing Applications Submitted</b>	10	0	5	7	4	33%
Total, Capital Raising Completed/Terminated	25	24	22	24	5	(67%)
<i>% in Capital Raising Completed/Terminated Submitting Applications</i>	35	24	27	31	9	(50%)
	71%	100%	81%	77%	56%	(33%)



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**Licensing \*\*\***

	FY End 2015	FY End 2016	FY End 2017	FY End 2018	as of 03/31/19	Chg. from 03/31/18
<b>Received during FY</b>	<b>25</b>	<b>24</b>	<b>22</b>	<b>24</b>	<b>5</b>	<b>(67%)</b>
1st Time SBIC Applicants	15	2	9	8	0	(100%)
Subsequent Fund Applicants	10	22	13	16	5	(50%)
Otherwise Resolved During FY	7	6	0	3	0	(100%)
<b>FY Number of New Licensees</b>	<b>25</b>	<b>21</b>	<b>15</b>	<b>25</b>	<b>5</b>	<b>(55%)</b>
1st Time SBIC Applicants	12	8	1	11	1	(67%)
Subsequent Fund Applicants	13	13	14	14	4	(50%)
Average Months to Process	8.4	5.8	5.1	8.2	7.7	1%

\* OII re-evaluated the data collection in the Office of Program Development. Consequently, the content of Licensing Pipeline, for previous years, was updated and therefore may not be consistent with previously issued Program Overview reports.

\*\* OII identified several historical data discrepancies. Consequently, the content of Program Development and Licensing Activity, for previous years, was updated and therefore may not be consistent with previously issued Program Overview reports.

\*\*\* FY2019 Licensing data has been adjusted for the lapse in appropriations.

**Leverage Activities in Operations****Debtenture Leverage**

Commitments Issued	\$2,553.0	\$2,514.3	\$1,959.8	\$2,521.9	\$690.6	(31%)
Draws	\$2,337.4	\$2,157.6	\$1,901.8	\$2,118.7	\$915.1	(21%)
Redemptions (Pre-Paid and at Maturity)	\$806.1	\$807.8	\$1,372.0	\$1,893.5	\$920.2	25%
Transfers to Liquidation	\$ 26.5	\$38.6	\$42.4	\$0	\$13.7	100%
% of Beginning Leverage Transferred	<1%	<1%	<1%	0%	.1%	100%

**Participating Securities Leverage**

Prioritized Payments (PP) Advanced	\$28.4	\$15.5	\$8.9	\$3.3	\$0.3	(86%)
<b>SBA Distributions</b>	<b>\$201.6</b>	<b>\$137.4</b>	<b>\$73.1</b>	<b>\$56.6</b>	<b>\$1.1</b>	<b>(97%)</b>
Prioritized Payments	\$24.8	\$13.1	\$1.8	\$4.0	\$0.0	(100%)
Adjustments and Annual Fees	\$3.7	\$4.0	\$0.4	\$17.0	\$0.0	(100%)
Profit Participation	\$13.3	\$5.1	\$11.3	\$13.6	\$1.1	(90%)
PS Redemptions--Operating SBICs	\$159.8	\$115.2	\$59.6	\$21.9	\$0.0	(100%)
Transfers to Liquidation	\$109.2	\$22.8	\$49.3	\$51.7	\$1.2	(25%)
% of Beginning Leverage Transferred	18%	7%	25%	60%	10%	429%
Prioritized Payments at Transfer	\$42.8	\$11.1	\$49.6	\$59.2	\$0.3	275%

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SBIC Examination Activities						
	FY End 2015	FY End 2016	FY End 2017	FY End 2018	as of 03/31/19	Chg. from 03/31/18
<b>Exam Reports Issued</b>	222	186	167	177	54	17%
Exam Cycle (months)	12.7	13.0	16.3	17.3	17.6	(7%)
% of Reports with Major Findings	19%	19%	17%	24%	13%	(63%)
<b>Licensees with Leverage</b>	173	137	126	139	44	19%
Exam Cycle (months)	11.2	11.5	15.4	16.9	16.2	(13%)
% of Reports with Major Findings	21%	19%	19%	26%	16%	(58%)
<b>Licensees without Leverage</b>	49	49	41	38	10	11%
Exam Cycle (months)	18.1	17.1	19.2	18.8	21.0	2%
% of Reports with Major Findings	8%	18%	12%	16%	0%	(100%)
Surrenders and Transfers to Liquidation						
<b>SBIC License Surrenders</b>	13	7	7	31	4	(75%)
Debenture	4	3	0	21	2	(85%)
Participating Security	4	4	3	5	1	(50%)
Bank-Owned/Non-Leveraged	5	0	4	4	1	100%
Specialized SBICs	0	0	0	1	0	(100%)
<b>SBIC Licensee Transfers to Liquidation</b>	3	2	6	4	2	0%
Debenture and Specialized SBICs	0	1	1	1	1	0%
Participating Security	3	1	5	3	1	0%
Activities in the Office of Liquidation						
<b>Participating Security Leverage</b>						
<b>Total Leverage Collections</b>	\$170.7	\$98.6	\$118.4	\$200.0	\$5.9	(93%)
Collections as % of Beginning Leverage	22%	14%	21%	44%	2%	(88%)
Leverage Write-offs	\$34.4	\$52.5	\$51.4	\$89.9	\$0	0%
Prioritized Payments Collections	\$14.1	\$2.7	\$0.4	\$50.7	\$8	(86%)
Prioritized Payments Write-offs	\$55.9	\$15.7	\$14.0	\$14.6	\$0	0%
<b>Debenture Leverage</b>						
<b>Total Leverage Collections</b>	\$83.6	\$54.0	\$37.8	\$9.2	\$3.5	(85%)
Collections as % of Beginning Leverage	24%	21%	16%	4%	2%	(80%)
Leverage Write-offs	\$36.0	\$7.1	\$24.7	\$12.7	\$0	(100%)

**SBIC Program**  
**Financing to Businesses by State**  
**Fiscal Year 2014 through Fiscal Year 2018**

State Name	FISCAL YEAR 2018			FISCAL YEAR 2017			FISCAL YEAR 2016			FISCAL YEAR 2015			FISCAL YEAR 2014		
	# of Financing	# of Businesses	Amount of Financing (\$M)	# of Financing	# of Businesses	Amount of Financing (\$M)	# of Financing	# of Businesses	Amount of Financing (\$M)	# of Financing	# of Businesses	Amount of Financing (\$M)	# of Financing	# of Businesses	Amount of Financing (\$M)
Alabama	1	1	9.6	5	4	17.3	8	7	71.4	9	3	21.6	7	6	42.1
Alaska	4	1	1.7	4	1	14.4	0	0	0.0	1	1	20.0	0	0	0
Arizona	56	26	96.6	62	18	168.5	79	26	95.5	57	24	82.8	33	21	64.7
Arkansas	13	5	53.4	11	6	24.6	5	2	6.5	26	5	57.8	11	1	2.5
California	392	175	1,040.1	447	169	893.5	463	192	1,041.3	438	196	1,015.3	297	151	785.2
Colorado	74	30	121.8	71	28	155.7	84	30	160.3	71	23	164.6	47	21	133.1
Connecticut	26	15	55.4	22	8	28.9	32	17	102.5	32	16	64.5	42	16	130.9
Delaware	3	2	2.4	4	3	16.6	9	3	20.3	5	2	27.0	5	5	9.4
District of Col.	7	5	14.7	3	2	2.0	5	3	6.0	0	0	0	1	1	0.3
Florida	154	63	256.5	202	70	417.8	176	62	418.5	217	74	476.6	136	52	335.1
Georgia	61	28	147.2	87	28	183.2	124	49	250.6	101	37	183.6	74	32	223.5
Guam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0	0	0	0	1	1	0.5	3	1	1.5
Idaho	8	4	35.3	7	5	9.3	7	3	22.1	4	3	5.0	6	3	15.6
Illinois	164	66	341.5	184	46	288.7	222	70	386.0	172	52	244.5	118	49	262.2
Indiana	45	16	96.7	50	16	104.3	34	16	32.8	27	15	142.9	24	8	53.2
Iowa	4	2	4.1	5	2	16.0	4	3	18.6	1	1	1.8	6	3	23.4
Kansas	30	16	58.0	25	9	20.5	36	13	75.4	29	10	53.9	20	12	21.7
Kentucky	6	5	28.7	8	5	49.3	12	6	15.4	23	9	25.7	11	5	14.7
Louisiana	16	8	104.1	20	8	55.3	20	10	55.2	32	14	74.1	36	10	53.5
Maine	12	7	34.1	8	3	18.8	5	3	26.1	5	3	8.6	3	2	4.2
Maryland	42	11	57.0	38	16	76.0	36	12	61.3	32	17	126.5	18	12	33.4
Massachusetts	105	53	258.5	96	51	229.1	126	60	264.3	144	71	266.4	138	73	231.5
Michigan	72	28	116.6	59	20	133.7	44	21	107.7	83	36	254.4	18	12	82.1
Minnesota	69	28	92.7	124	30	185.2	83	29	145.3	55	26	165.7	54	26	106.3
Mississippi	7	4	26.4	17	3	17.6	22	3	21.5	7	2	6.4	2	2	23.4
Missouri	61	23	108.9	63	24	85.7	46	17	66.2	51	22	107.7	37	16	99.0
Montana	14	3	23.4	11	2	12.4	4	1	23.0	1	1	1.0	4	1	4.5
Nebraska	11	6	52.7	11	5	37.7	2	2	11.8	2	1	10.9	5	3	20.4
Nevada	7	4	23.3	6	3	1.3	12	2	16.7	16	4	53.5	6	3	28.6
New Hampshire	9	6	25.5	13	5	26.3	9	6	34.5	2	2	7.9	15	9	43.3
New Jersey	111	46	241.9	87	37	208.7	81	30	166.8	86	52	152.0	110	59	187.0
New Mexico	4	2	2.2	5	3	15.3	10	6	17.2	11	5	20.9	5	3	3.6
New York	233	124	482.6	178	94	389.9	247	123	373.1	183	106	329.0	236	139	506.1
North Carolina	72	28	138.5	84	36	167.3	114	40	164.5	140	41	198.8	137	49	271.5
North Dakota	21	2	10.3	18	4	12.9	16	4	15.0	0	0	0	0	0	0
Ohio	97	46	136.9	81	29	111.5	95	41	297.0	57	26	132.7	45	22	111.8
Oklahoma	27	8	29.8	22	10	27.8	32	12	52.1	40	15	85.2	31	9	36.7
Oregon	40	16	118.7	19	11	44.5	14	6	34.7	27	10	142.3	24	10	57.7
Pennsylvania	77	31	130.0	134	40	317.3	99	37	254.4	110	50	331.1	68	33	228.0
Puerto Rico	3	2	2.8	1	1	1.5	3	2	8.0	0	0	0	3	2	5.6
Rhode Island	9	2	10.0	3	2	1.1	4	2	15.7	6	2	6.1	6	3	10.6
South Carolina	16	10	53.6	49	10	46.0	36	16	96.4	14	7	38.5	33	13	73.2
South Dakota	3	2	20.0	0	0	0	2	1	0.4	2	1	8.9	9	3	30.4
Tennessee	48	23	123.2	50	25	124.7	44	19	100.2	43	20	73.9	41	21	137.5
Texas	276	89	427.6	253	94	486.1	273	107	527.4	299	108	701.9	237	85	532.2
Utah	49	31	75.6	43	23	61.3	57	34	90.6	71	40	125.4	39	21	129.5
Vermont	2	1	3.0	1	1	3.1	2	1	16.5	4	1	8.9	6	5	30.8
Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Virginia	47	19	72.1	37	21	153.8	36	21	75.6	33	16	73.4	52	23	80.7
Washington	33	10	37.4	41	12	79.7	28	10	41.9	43	21	107.8	25	15	90.3
West Virginia	0	0	0	0	0	0	0	0	0.0	1	1	0.3	0	0	0
Wisconsin	37	15	91.3	32	14	105.3	28	17	78.0	29	14	79.0	25	12	83.0
Wyoming	1	1	0	0	0	0	2	1	4.8	0	0	0	0	0	0
	2,711	1,151	\$5,502.6	2,779	1,077	\$5,727.3	2,962	1,201	\$5,991.7	2,815	1,210	\$6,285.5	2,309	1,085	\$5,464.6



December 1, 2017

The Honorable Linda McMahon  
 Administrator  
 Small Business Administration  
 Washington, DC 20416

Dear Administrator McMahon,

With the transition completed, fiscal year 2017 closed, and the calendar year coming to an end, I write you today to provide an update on the Small Business Investment Company (SBIC) program from the perspective of the small business investor community.

While no program is perfect, the SBIC program inherited by this Administration was operating well and had been for a very long time. SBICs were investing near record amounts in domestic small businesses, losses were at record lows, licenses were being processed in a timely manner, quality fund managers were being attracted to the program, jobs were being created, and there was record interest from institutional investors to provide capital to small businesses via SBICs. The program was working to benefit America's small businesses. With the increased small business optimism spurred by the election of President Trump and with your appointment to lead the Small Business Administration, SBICs were optimistic that they could be a constructive partner in translating that optimism into positive outcomes.

By the close of FY 2017, the optimism around the operation of the SBIC program has changed. Licensing for first time SBIC funds was down 92% year over year. Licensing for all Debenture SBICs funds (first time and repeat SBICs) was down 35%. This reduction in licensing appears less precipitous than it really was because the licensing numbers in FY 2017 included strong licensing results from the previous Administration. For example, through March 31 of this year total licensing was up 40% year over year, but then there was a change and licensing finished the fiscal year down 35%. The number and amount of investments by SBICs were down in FY 2017 as were the jobs created, but the actual amounts are not known because the SBA's Investment Division ceased releasing most SBIC data to the public. Some private institutional investors (e.g., endowments, banks, pension funds) that provide the bulk of the private capital into SBICs have become unnerved by the slow pace of the operations of the program, the unpredictability of licensing and operations, and the lack of constructive engagement by the political leadership of the Investment Division. Some of these institutional investors are now building in an additional four to six month waiting period for each stage of the licensing process, while others are completely stepping back from the SBIC program until there is new management of the program. The new management culture and practices are discouraging the best fund managers from being in the program and this will create an adverse selection problem and create unnecessary downside risk that previously did not exist. In sum, there is now a serious leadership problem at the Investment Division that has not existed since the nadir of the program during the period of mismanagement from 2007 through January of 2009.

The pro-small business regulatory reforms and performance of the 7a program are clear examples of what the Trump Administration, as good stewards of a small business program, is accomplishing. However, and in contrast to the successes of the 7a program, there is very deep and broad-based concern across the small business investor community about the management of the SBIC program. Given that this program was fully operational less than a year ago, there is still time to address the problem before the current situation is institutionalized. Given your unwavering commitment to American small businesses and your entrepreneurial and executive experience, I ask that you address the problem in the SBIC program before a stable, productive small business resource becomes neither stable nor productive.

The SBIC industry is committed to improving the nation by empowering small businesses and the SBIA would welcome the opportunity to work constructively with the SBA to make effective use of the Small Business Investment Company program.

Sincerely,

A handwritten signature in blue ink that reads "Brett Palmer" with "P.S." written below it.

Brett Palmer  
President  
Small Business Investor Alliance

cc: The Honorable Althea Coetzee Leslie



August 10, 2018

Joseph Shepard  
Associate Administrator  
Office of Investment and Innovation  
Small Business Administration  
409 3rd Street SW, Suite 6300  
Washington, D.C. 20416

Re: Industry Comments on Reducing Regulatory Burden

Dear Associate Administrator Shepard:

For 60 years, the Small Business Investor Alliance (SBIA) has been the trade association that serves as the collective voice of the Small Business Investment Company (SBIC) industry. SBIA's membership includes both GPs and LPs in the SBIC program. This membership ensures that our SBIC policy proposals are solid, balanced, and aligned with promoting a healthy capital market for small businesses.

Debenture and non-levered SBICs are highly-regulated private funds that serve the important public purpose of facilitating private investment into domestic small businesses. Core to the success of the program is that investments are market-driven and not government-chosen. A 2017 Library of Congress study found that SBIC-backed businesses created 3 million net new jobs and supported an additional 6.5 million jobs from 1995-2014 (a period of 20 fiscal years that included the Great Recession and the tech bubble recession). The underlying economics of the SBIC program are sound: for years it has maintained its zero subsidy, and for several years it has been operating at or near the lowest loss rates in the 60-year history of the program.

On August 15, 2017, SBA published in the Federal Register a request for public comment entitled "Reducing Unnecessary Regulatory Burden." The request was issued in accordance with three executive orders aimed at reducing regulatory burdens. Executive Order 13771 was issued by President Trump on January 30, 2017 and has the goal of reducing regulatory costs by eliminating two regulations for every new regulation that is issued. Executive Order 13777, issued by President Trump on February 24, 2017, aims to—among other things—repeal, replace, or modify regulations that "eliminate jobs, or inhibit job creation; are outdated, unnecessary, or ineffective; impose costs that exceed benefits;" and "create a serious inconsistency or otherwise interfere with regulatory reform initiatives and policies." Executive Order 13563, issued by President Obama on January 11, 2011, requires agencies to propose regulations whose benefits are justified by their costs and to issue the least burdensome regulations possible. In November 2017, SBIA submitted a comment letter in response to the August 2017 request from SBA. SBIA stands by that letter and would like to see those recommendations implemented. We submit the comments below as additional items that would make the SBIC program operate more efficiently.

President Trump deserves credit for his pro-small business efforts to reduce regulations and taxes. Further, SBIA is supportive of the goals laid out in the President's executive orders and appreciates the opportunity to comment on ways to reduce unnecessary regulatory burdens. SBICs embody SBA's goal "to preserve free competitive enterprise and to maintain and strengthen the overall economy of our nation," while instituting strong taxpayer protections. SBICs are proof that these goals can coexist, and we welcome the opportunity to offer suggestions to extend and enhance that record.

The recommendations contained below are all in line with the goals of the executive orders issued by Presidents Trump and Obama and applying them would ease burdens on small business investors and help unleash more capital to domestic small businesses in a more efficient manner.

In preparation for the SBA's regulatory review, SBICs and Limited Partners (LPs) were surveyed about the regulations and, equally important, the SBA's real-world application of the regulations. Many of our LPs participated in a conference call to help us further flesh out our comments to reflect their views. SBIA staff also spoke to many more SBICs, LPs, lawyers, and accountants to ensure we were capturing and communicating critical issues. The survey produced results based on a very large sample size of all actively investing SBIC license holders. Fund managers who hold over 100 active SBIC licenses completed the survey as did LPs who have investments in a similarly large number of SBIC funds. The survey encompassed the four main regulatory aspects of the SBIC program: licensing, operations, examinations, and forms.

This comment letter includes some of the findings of the survey. For the sake of brevity, we are including only comments which received overwhelming consensus from the SBIC industry and which are appropriate for this specific comment letter. It is important to note that a number of SBICs had serious concerns about responding to the survey out of an explicitly stated fear that SBA would trace back their responses and retaliate against them if SBA was able to identify fund managers who had raised concerns about the regulations or how they were being applied. As such, SBIA will only be describing the results of the survey and not be releasing the survey or any other information that could be tied back to any specific person, group, or SBIC fund.

#### **Overall Regulatory Challenges**

The Debenture and non-levered SBICs have been successfully operating for decades under regulations that have barely changed. Most of the regulations are time-tested and reasonable. While the regulations have been adequate to the task, with the passage of time, personnel, and management philosophies, a review and update of the regulations and their applications are appropriate. Our survey documented a significant number of regulations, policies, and practices that are unnecessary, outdated, burdensome, conflicting with other law, and hindering job creation. By an overwhelming margin in our survey, respondents noted that the biggest challenge facing the SBIC program is uncertainty about the management of the program and confusion about the current leadership's vision for the operation of the program, not the regulations. Not only was this the answer to the specific question about the biggest challenge facing the SBIC program, it also showed up in the "word cloud" of responses to the survey. Words like "confusion," "delays," and "uncertainty" were some of the most common concerns. Words like "clarity," "timelines,"

“consistency,” “standards,” and “communication” were some of the most common in the questions where suggestions for improvement were sought. SBIA applauds SBA’s efforts to clean up and modernize the regulations, but we also strongly encourage SBA to focus on fixing the delays, uncertainties, and other execution problems that may continue long after any written word of regulation is changed. LPs described it this way:

[It is now] about 20 months into the Administration and the leadership of the SBIC program has not articulated what they want to accomplish with the Small Business Investment Company program.

Improved regulations are welcome, but how the leadership of the SBIC program implements the regulations has a far bigger effect on how effective SBICs are allowed to be.

LPs choose between competing investments every day. If the leadership of the SBIC program makes it difficult to invest in SBICs and for SBICs to operate, then we can redirect our investments away from SBICs and small business and into other investments.

#### **SBIC Licensing**

SBIC licensing is core to the program because without a license, no investments can be made into small businesses. SBA has an extraordinary group of public servants doing the best they can to fulfill the demands of their jobs. They are at the front lines of both taxpayer protections and small business access to capital. The SBICs and LPs are concerned that licensing is understaffed and that the staff does not have the adequate technological resources needed to perform at their full potential. LPs in particular see the SBIC licensing team as disciplined professionals who complement the private sector’s efforts to vet and approve fund managers. Further, there are a number of regulatory and policy improvements that can make licensing clearer, faster, and better for both applicants and the SBA.

#### Green Light letters

SBIA’s members believe that the SBA’s Green Light letter process should lay out the specific targets that the applicant must reach to be licensed. SBA should honor their letter and license applicants who meet the standards set therein, provided that no new material adverse information develops during the review of the license application. If SBA’s expectations are clear, quantifiable, and written, then there is greater transparency and less regulatory frustration for both sides. Clear standards must be communicated from the Agency Committee to make this happen. Also, LPs commit to GPs and their business model. SBA forcing changes to the business model that was approved for the Green Light, by significantly reducing leverage late in the process, is not fair to LPs or GPs.



#### Agency Committee

The survey shows there is overwhelming confusion or doubt about the value that the Agency Committee brings to the licensing process. The Agency Committee was created under the Administration of President Bill Clinton to get more political appointees involved in SBIC licensing. The Agency Committee makes decisions without many of its members having ever met an SBIC fund manager, without any members ever meeting the applicant whose fate they are deciding, without clearly documenting and communicating their expectations and standards to the Office of Investment, and without ever communicating their expectations and standards to the small business investing community. By the time applicants reach the Agency Committee for their consideration, hundreds of thousands of dollars and up to two years may have been spent forming the SBIC, but these expenses and applicants' work going through the process is not necessarily valued or respected.

It should be noted that, according to SBA's Standard Operating Procedure (SOP), all issues must have been dealt with satisfactorily before being presented to the Agency Committee. So, if all the legal, financial, and other approvals have already been satisfied, then it is not clear what value this body adds to the process. SBA should either have the Agency Committee communicate their standards and expectations to the SBIC community, or it should reconsider what value this additional step adds to the process beyond more time and expense. Every member of the Agency Committee was invited to meet the SBIC industry at SBIA's 2018 Washington Fly-In, and none accepted the invitation. SBIA would welcome the chance to have members of the Agency Committee engage the SBICs and understand more about our market.

#### Licensing Decisions Based on Facts in the Record (13 CFR 107.305)

Licensing decisions by SBA should be based on the facts in the record that are discovered during the process of approving a fund. The licensing team in OII does excellent diligence, a very small amount of which must be kept confidential, but there is no documentation of how decisions are made or what facts were used to make determinations. Applicants should have the right to address or correct any issues, but they cannot do so if they do not have a chance to address and correct the record.

#### Specific Reason for Non-Approval with Opportunity for SBIC Applicants to Cure

SBIA's survey respondents believe that SBA should give applicants clear and specific reasons for non-approval with an opportunity to cure any issues that SBA raises. Not every applicant for a license is worthy of licensure, but some issues deemed worthy of non-approval by SBA can often be cured by the applicant. If applicants cure the issues, SBA should promptly reconsider the application and grant approval if all conditions are met. An applicant should not be turned down or prohibited from filing a formal application without a clear, meaningful, written explanation from the SBA and a good faith opportunity to fix any issues. The SBA should also recognize that some of the reasons SBICs are being delayed or prohibited from filing an application are 100% due to SBA's actions or inactions and are on matters over which the applicant has zero control (timing of exams, for example).

#### Clear Appellate Mechanism for Adverse Decisions

SBIA members also believe that a clear appellate process should exist for funds who receive an adverse regulatory decision, particularly, but not limited to, licensing.

#### Meaningful Fast-Track Licensing for Known, Repeat SBIC Applicants

SBIA members surveyed unanimously support a meaningful fast track licensing process for repeat SBICs. The GAO has studied the risks of first-time and repeat licensees and found that repeat SBICs are lower risk<sup>1</sup>. Repeat licensees (some of whom have been successfully operating SBICs for decades) are fundamentally less risky and more well-known to SBA than first time applicants. SBA is intimately aware of their investments and is very familiar with their management teams and investment strategies. Beyond a new FBI background check and review of new capital certificates, nothing is not already known to the SBA. If there are no material changes, the process should be significantly expedited.

Existing SBICs have the added burden of not being able to apply for a license until SBA's (recently broken) examinations process has run its course. Existing SBICs may already have had dozens of clean exams previously, but that is not considered. First-time licensees have never been examined and therefore do not face these unnecessary delays. Existing SBICs should not face delays or have limitations put on the amount of leverage they can access because of an examination process that is completely outside of their control. (Greater explanation of the issues surrounding the problems with examinations are covered later in this letter.)

Recognizing the inefficiencies created by the treatment of existing SBICs and how that removes resources from attracting and vetting new SBICs from across the country, the House and Senate Appropriations Committees' Financial Services and General Government appropriations bills for FY 2019 recommended a 60- to 90-day window for repeat licenses.

#### Transparency During the Licensing Process

SBIA members surveyed unanimously agreed that the licensing process should be more transparent, more predictable, and that applicants should know where they stand at all stages during the process. As one LP described it, "The inability to forecast licensing causes cash flow and allocation planning problems for many LPs." Further, an LP described the following:

SBA wants banks to finalize their commitments to SBICs before licensure, but banks investing in SBICs are being forced to withhold their commitments until after licensure because we don't have insight into the timing of the licensing process. Banking laws do not allow us to be put in the position of being held hostage to the SBA's uncertainties.

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<sup>1</sup> U.S. Government Accountability Office, *Small Business Investment Companies: Characteristics and Investment Performance of Single and Multiple Licensees*, GAO-16-107 (Washington, DC, 2016), 14-18.

Other SBIA members described the situation this way:

Institutional Investors need to plan allocations yearly. SBA's delays have caused us problems with planning our allocations. Further, we have been forced to go back to our investment committee to get renewed approvals or to rebalance our allocations because of SBA's actions and timing.

For those of us (LPs) that are publicly traded companies, this is a problem because we want to be transparent with our shareholders who hold us accountable for meeting the investing goals that we set.

Acknowledging Receipt of Materials and Accepting All Forms (Including Licensing Materials) Electronically without a "Wet Signature"

The requirement for a wet signature of licensing or regulatory materials is unnecessary, and the survey showed that removal of this requirement is overwhelmingly supported by SBIA members. With current technology, all required signatures can be collected safely and securely electronically. SBIA's membership recognizes that this is not a requirement that is peculiar to SBA. Accepting materials electronically will also address the issues/questions about when materials were received. The date SBA received regulatory or licensing requests should not be a question. This could easily be addressed with the use of virtual data rooms and other off-the-shelf technology, like email.

SBICs Should Receive Their Actual License within Two Weeks of Approval

SBICs need their license to operate and for their bank LPs to comply with banking law. Upon approval, SBICs should receive their actual license as soon as possible and definitely within two weeks. SBIC survey respondents overwhelmingly agreed on this point.

Recently, it has taken months to get a written confirmation of licensure. This time frame is arbitrary, expensive and challenging for the licensee, and does not benefit small businesses seeking capital. These delays are an added headache for bank LPs who need the letter to document compliance with banking laws. SBA should have a regulation providing SBICs with a timely confirmation of licensure. SBA should also publicly announce when funds are licensed and when licenses are surrendered.

SBICs Should Be Able to Maintain Their Licenses in Wind Down after Paying Down Their Leverage Below the \$5 Million-Dollar Threshold

When SBICs complete their life cycle, their fund size will eventually reduce to zero, but before they get to zero, they generally drop below the \$5 million minimal threshold that SBA requires. Surrendering the license can harm bank LPs because of the banks' allowance to invest in SBICs under the banking laws. Survey respondents feel that SBA should allow SBICs to hold onto their licenses as they wind down and should make regulatory changes to significantly reduce the cost of operating SBIC funds that are in wind down. At the final stages of a fund's life there is minimal fund income, so it is important that SBA reduce regulatory costs so as not to create an artificial incentive to surrender the license.

SBA's Model Limited Partnership Agreement (LPA) Should Be More Customizable

SBA has a fairly rigid model LPA. SBIA recognizes that the lawyers reviewing the SBIC LPA are severely under-resourced, which requires some level of standardization. It is very hard for an applicant to make changes to the LPA, even the "non-bold" language that is theoretically flexible. SBIA members surveyed believe that there should be more flexibility for General Partners (GP) and institutional Limited Partners (LP) to negotiate market terms for their LPAs. SBA should require LPA language that is necessary to fulfill its statutory mandate and provide the necessary protections to serve its role as a guarantor of a credit facility and as a regulator. Since SBA is a guarantor of a credit facility and not an LP, it should leave the non-statutory and non-credit related terms to the GPs and LPs to negotiate.

Affiliation

The SBA's affiliate rules need to be updated to ensure that investments with private equity funds are not inadvertently limited, survey respondents agreed. Some SBA regulations were written before related SEC regulations were written and now the SBA regulations need to be updated to reflect these changes. The lack of an exception from affiliation for portfolio companies that are owned by private equity funds that are exempt from registration under the Investment Company Act of 1940 because of Section 3(c)(7) only restricts or harms SBICs' investment activities. The exemptions from the Affiliates definition should be changed to expressly include 3(c)(7) funds. Many SBIC funds are affected by this regulation, and a simple fix would be to remove the current exception under 13 CFR 121.103(b)(5)(vi) and replace it with a reference to any "private fund" as defined by SEC Rule 203(m)-1, which includes any 3(c)(1) or 3(c)(7) fund.

**Capitalizing an SBIC: Private and Regulatory, Institutional Capital**

LP Capital from Bona Fide "Funds of Funds" Should Be Recognized as Institutional Capital

There are a number of well-established, proven "Funds of Funds" whose investments in SBICs are not treated as institutional regulatory capital. This harms capital inflows into domestic small businesses and does not treat all significant LPs similarly. SBIA's survey revealed that well-known and established Funds of Funds who meet or exceed the qualifications to be an "institutional investor" should be treated as providers of institutional, regulatory capital. We recognize that a new Fund of Funds that might warrant scrutiny and a review, but there are top-tier, long establish, SEC-regulated Funds of Funds that are not treated as institutional capital. Further, fair treatment of the Funds of Funds model will allow new entities to form to provide professional investment opportunities to unique sources of capital that may need to be pooled to gain the benefits of scale, to access unique market expertise, or to find particularly SBIC characteristics (looking for SBICs that focus on rural areas, for example).

Pensions and Endowments from State-Chartered Universities Should Be Recognized as Private, Regulatory Capital Instead of as "Instrumentalities of the State." (Instrumentalities of the State May Not Qualify as Regulatory Capital.)

Recently, SBA has started treating endowments and pension funds from some universities as "instrumentalities of the states." This is not an accurate description of what they are. Further, this

treatment effectively blocks other endowment and pension funds from investing in an SBIC that has these investors. As one large LP described it, “SBIC investments are only a fraction of our multibillion dollar endowment’s overall capital. If SBA continues to make it difficult to invest in SBICs, then we can and will redirect our investments away from domestic small businesses to other investment opportunities.” This new interpretation of the regulations runs directly counter to the President’s goals for fostering domestic investment and small business job growth.

SBA Should Recognize LP Investments from Canada and Other Treaty Countries as Regulatory Capital

Under US law, investments from certain countries may not be discriminated against. Canada, Australia, and Mexico are three examples where this US law applies. Contrary to US law, SBA is not treating investments from these countries as regulatory, institutional capital. Survey respondents agreed that SBA’s regulations should be modified to reflect existing law. Creating barriers for our trading partners to empower domestic small businesses via SBICs appears to run counter to the President’s goals for job creation and more equitable treatment of American small businesses.

Transfer of LP Interests That Represent 10% or Less of an SBIC Fund Should Be Streamlined or Permitted without Prior SBA Approval

SBICs have Limited Partner Advisory Committees (LPACs). Survey respondents feel that if an SBIC has the approval of its LPAC, then it should be allowed to transfer smaller LP interests (10% or less of the committed capital). Existing restrictions are cumbersome and unnecessary.

Side Letters

Side letters are necessary documents for many LPs, particularly banks. Many banks have their own standard side letter to reflect their bank’s (banking) regulatory requirements. Side letters are extremely time consuming to the under-resourced legal staff because they are commonly treated as if each were *de novo*. SBIA’s survey found that side letters that have already been approved and used numerous times by LPs (commonly from bank LPs) should be presumed by SBA to be acceptable for future commitments. Alternatively, LPs should be able to get a standard side letter pre-approved once for use across multiple and future funds that they plan to invest in for a set period of time. SBIA’s LP Council could work with SBA to provide guidance and standards for these side letters.

**SBIC Operations**

Common Contact File/Resource to Prevent Multiple Requests for Information

Survey respondents said that SBA should have a common contact file/resource/customer relationship management system in place that will prevent SBA from asking for the same information that has previously been submitted – often many times or in many similar ways. Redundant requests of information are common, burdensome, and could be easily remedied. A system of this type could expedite processes at SBA significantly and reduce burdens for both SBICs and the SBA.

#### Addressing Regulatory Questions through a “No Action Letter” System

SBIA survey respondents overwhelmingly support the establishment of a no action letter system, modeled off that of the SEC, to help SBIC industry participants address good faith regulatory questions that may arise. SBIA believes this would help facilitate productive communication between industry participants and regulators and would provide an outlet to address questions and potential issues early. As appropriate, no action letters should also be shared with the SBIC community so there is clarity in the regulatory environment.

#### Conflicts of Interest (13 CFR 107.730)

The conflict of interest rules are being interpreted so narrowly that in some cases they are now harming LPs and GPs by preventing or terminally delaying legitimate small business investments. Similar to transfer of LP interests below a certain threshold, if the LPACs from two affiliated SBICs (often two successive SBIC funds, e.g., SBIC Fund 1 and SBIC Fund 2) both agree that an investment is appropriate, then it should be allowed. With LPAC approval, and when two SBIC entities are financing a small business under the same terms, this should be automatically approved and should not be viewed as a conflict of interest. SBIA survey respondents recommend that the regulations follow 13 CFR 107.730(d)(2) for conflicts of interest. The regulations should also provide automatic approval if all SBIC LPACs have been approved and the SBA has not made a determination within 30 days.

#### Overline Requests (13 CFR 107.740)

SBIA’s members recommended in the survey the establishment of clear, binding timelines within which SBA must make a determination on overline requests, or else the request should be deemed approved if the LPAC has already been approved of the investment. Such timelines will be helpful in reducing uncertainty and providing structure for industry participants. If SBA does not decide on an overline request within the time allotted (30 days), requests should be granted automatic approval. It should be noted that during the economic stresses of 2008, small businesses failed, and Americans lost their jobs because SBICs were not able to get timely approvals for follow-on SBIC investments from the SBA. The economy is solid now, but the regulations will need to be applied in tougher times, too. No American should lose their job because paperwork was pending for month after month at SBA.

Similarly, SBIA and its members overwhelmingly feel that the SBA should develop clear and binding timelines for processing all regulatory requests, not just overlines, to promote efficiency and certainty in the industry. SBA should create a list of regulations that will be deemed approved if SBA does not make a decision within a pre-determined amount of time.

#### Personnel Changes and Absences

By regulation, the SBA should provide SBICs with a formal notification when their analyst, examiner, etc. is reassigned or on extended leave. It is not uncommon that an analyst leaves the government, leaves SBA, goes on extended vacation, is out ill, or otherwise becomes unavailable. Often, no notice is given to the SBIC, and no information is given as to whom critical and time



sensitive requests should be submitted. In this scenario, SBICs could unknowingly submit time-sensitive regulatory requests to a person who is unable to receive the filing.

SBIA members surveyed believe that SBICs should be aware of whom they are supposed to communicate with at all times. SBIA hopes that informing SBICs of analyst changes will facilitate improved communication between SBA and the industry and contribute to the smooth functioning of regulatory processes. Further, the use of virtual data rooms and other off-the-shelf technologies commonly used in the private sector will make it easier for SBA staff to find information and records when assigned to a new SBIC.

#### Fund Expenses vs. Management Company Expenses

According to the survey, SBIA members feel that the allocation of an expense as either a fund expense or a management company expense should be negotiated between the private LPs and the GPs in the LPA. The expense allocation should not be decided solely via SBA regulation; rather, a negotiated decision made jointly by LPs and GPs in the LPA will allow for a mutually beneficial solution. It is appropriate that expense allocations should be included in the LPA which is shared with SBA.

#### Technological Modernization

Similarly, SBIA's members support the removal of regulations related to outdated technological requirements. Specifically, SBICs should no longer be required to maintain a fax machine at the primary office (13 CFR 107.504), as email and mobile communication systems provide faster, more reliable, and more ubiquitous forms of communication.

Additionally, to prevent fraud and protect market information, the SBIC industry participants responding to SBIA's regulatory survey agreed unanimously that the SBA should have a secure, encrypted mechanism for communicating sensitive materials and information such as leverage commitments and wiring instructions. Cybercrime is a growing problem across all industries, and SBICs, their LPs, and the SBA all should have more secure communications for the movement of large financial transactions than conventional email provides. It should be noted that the survey received comments about making sure any new communications system or portal not be too cumbersome, expensive, or limiting.

#### Recordkeeping

SBIA survey respondents recommend that SBICs be allowed to use a single safe to maintain the records for all affiliated SBICs. SBICs should also be allowed to keep records electronically in secure virtual data rooms or other secure cloud services.

#### Prepayment of Financing (13 CFR 107.830)

SBIA survey respondents also recommend that SBICs be allowed to put modest pre-payment limitations on the capital they invest in small businesses. Small businesses should be allowed to make prepayments, but reasonable limitations should be permitted. Every prepayment requires time and some expense by the SBIC. Being paid a penny (or a single dollar) is not reasonable. Perhaps prepayments of at least a certain percentage—5%, for example—would be reasonable.

#### SBIC Industry Data

SBA should return to publishing SBIC industry data on a regular, timely basis, according to the majority of survey respondents. The 7a and 504 programs release their data weekly. The SBIC program used to release the data monthly, and it would be released within a week of the month ending. Now SBA releases the data quarterly and waits an additional 6 weeks to release the data. LPs and GPs would benefit from having fresh, not stale, data. SBIC industry participants rely on up-to-date data to identify industry trends and remain informed as they make key decisions pertaining to their businesses. This data should be released monthly and within 5-10 business days of the end of the month.

#### Cost of Money

SBIA members believe that cost of money regulations should be made more flexible. Further, the definition of “default interest” should be revised to allow for increased charges without violating the Cost of Money. The definition of default should be expanded to be more consistent with the market and to not leave SBICs and the SBA in a disadvantaged position. SBICs should be allowed to be more proactive in taking necessary steps to address risks to investments.

#### Liquidations

SBIA members who were surveyed also overwhelmingly believe that an SBIC should be able to get out of “liquidations” and back into regular operations if the issues that caused them to be moved to liquidation are cured, and they otherwise would be able to operate as an SBIC. This is an unusual circumstance, but it should be addressed.

#### Debenture Pooling

SBIA survey respondents feel that the SBA should pool SBIC debentures four times a year (instead of the current two) and allow repayment four times a year (instead of the current two). Until about 10 years ago, SBA pooled four times a year (twice for Debenture SBICs and twice for the defunct Participating Securities program). SBICs may draw leverage and have to wait up to six months to know the interest rate on that leverage. SBICs also may be paid back from a small business and have millions of dollars sit idle for up to six months. If SBA were to keep the exact terms on the SBIC debentures, but pool/price four times a year instead of two, then SBICs would often have less timing/interest rate risk and would be able to pay back debentures sooner and reduce risk to SBA. This could be achieved without any change to the offerings other than adding summer and winter pooling/pricing dates.

#### OII Interaction with SBIC Fund Managers and Limited Partners

SBIA members would also like to see more engagement by OII leadership with the SBIC industry via SBIA. If there are regulations that are somehow preventing the OII leadership from attending industry gatherings, then those regulations should be changed. The leadership of OII has attended only one of the many SBIA industry events held since January 2017. These events are an opportunity to learn about what is happening in the market the SBA is regulating. Industry dialogue has been exclusively in closed, invite-only settings where the government chooses the participants;



in private, one-on-one meetings with LPs and GPs; or in settings where all questions are screened/chosen by SBA and all the answers are pre-scripted. This lack of engagement by SBA is not only an inefficient and ineffective way of having two-way communication, but it also raises doubts that market participants are being told the same information. As one LP put it, “The leadership of the SBIC program should be engaging the SBIA to work with SBICs and with LPs. Engagement should be regular and two-way.”

## **Examinations**

### Examination Reports

SBIA survey participants recommend that examination reports be provided to the SBIC within four weeks of a completed examination. Despite recent massive increases in examination fees, the examination process has recently become a choke point for the effective operation of the program. Currently, exams are being completed with the examiner verbally informing the SBIC that there were no findings, but the actual letter informing the SBIC of the results of their exam may not be given for up to six months later – awaiting approvals from higher ups at SBA. There is no justification for these delays in issuing the examination letters. This means that the SBIC may be blocked by SBA from reserving leverage or from submitting a licensing application for another entire year and exam cycle because their exam results are considered out of date and stale. It is also inappropriate for SBA to exclude from the licensing times report the amount of time SBA blocked SBICs from filing for a license due to SBA’s inability to produce an examinations letter.

It should be noted that licensed SBICs have been unable to invest because they have been waiting many months for the results of their examinations and therefore cannot purchase leverage. There is no reason SBICs are not given their results promptly after the examination. Further, the SBIC has begun misusing the existing regulations by applying a “must” standard to regulations that clearly state “should” regarding a fresh examination. Further, SBA’s delays in issuing exam reports prevent SBICs from responding to potential findings and resolving any outstanding concerns – meaning that they may get findings two consecutive years because SBA withheld that there was a finding, adding to SBICs’ expenses under the new higher fee regime. Timely exam results empower the SBICs to make needed changes prior to their next review.

Finally, it is critical to note that SBICs have absolutely zero control over when they receive an exam, but SBA is holding SBICs accountable for the timing of the exams by blocking their ability to file for a license or access leverage. Ultimately, both of these withholding actions hinder the ability of small businesses to access capital.

### Examinations for Multiple SBIC Licenses

The overwhelming number of survey respondents thought it best to have all licenses of an SBIC platform examined at the same time. It is not uncommon to have multiple licenses under common control examined at different times by different examiners. This is inefficient for both the SBIC and the SBA. Further, during examinations, many smaller SBICs are unable to continue their normal operations until the exam is complete, so spreading out the exams is particularly disruptive. Finally, having all licenses reviewed simultaneously by the same examiner will prevent getting

different results for the same practice inside the same SBIC group. However, simultaneous or sequential examinations should not be a reason for SBA delaying examinations in a way that could delay licensure, leverage, or other actions.

#### Examination Issues Shared with the Industry

There was overwhelming support in SBIA's member survey for the SBA to share an annual notice of the most common examination findings. Once a year, the SBA should share with the entire SBIC industry the most common negative findings from examinations. SBIA would be happy distribute this information and help the SBIC industry develop "best practices" to make regulatory violations far more rare. If GPs and LPs are informed of the most common errors, then GPs will have the opportunity to proactively review their practices to make sure they are in full compliance, and LPs will be able to consider these matters when interviewing funds for future investments. All parties will benefit from SBA sharing this information.

#### Examination of the Management Company

SBIA members also responded in the survey that examinations should be limited to the examination of the SBIC. SBA commonly examines things well outside of the scope of their legal and regulatory authority, specifically the management company contracted with SBICs. SBA should not conduct such examinations unless there is a specific, clear, and compelling reason to review the management company. Management companies regularly manage SBICs and non-SBIC vehicles, and the examiners confuse the two, causing SBIC regulations questions to be raised on entities that are not SBICs. SBA should clarify the regulations and SOP to make sure they are not wasting the time of SBA examiners and the money of SBICs by examining issues outside their legal mandate.

#### Choice of Accounting Method

SBICs should be given the option of using Generally Accepted Accounting Principles (GAAP) instead of statutory accounting at the time of licensure. Given the unique nature of leveraged SBICs, statutory accounting is needed while leverage is outstanding. Once leverage is paid off, SBICs should be allowed to reduce their operating expenses by going to GAAP.

#### Updating Forms

The survey received many comments that most SBA forms relating to the SBIC program are outdated, confusing, redundant, or overly cumbersome and require updating. SBIA's survey participants specifically identified Form 468 as confusing and difficult to read, with no opportunity to amend or correct investments that were entered erroneously. SBIC participants also identified Form 1031 as particularly dated, complicated, and in need of reform. SBA and SBIA should conduct a joint review of its SBIC forms to streamline and remove duplicative content.

The SBIC-Web system was always clunky, but recently it has become at times almost unworkable – with delays for each data entry being measured in seconds. With hundreds of entries required, it takes days and nights to enter the data. With the recent changes, SBIC-Web is also regularly unavailable to even access. Recently, SBA's use of technology has been getting worse, not better. SBA should allow SBICs to submit an Excel spreadsheet if SBIC-Web is not working.

SBIA thanks the Small Business Administration for its attention to SBIC regulatory issues and appreciates the opportunity to share feedback from the SBIC community. We look forward to a thoughtful and continued dialogue throughout the regulatory review process.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brett Palmer".

Brett Palmer  
President  
Small Business Investor Alliance



February 7, 2019

Mr. Joseph Shepard  
Associate Administrator  
Office of Investment and Innovation  
U.S. Small Business Administration  
409 3<sup>rd</sup> Street SW  
Washington, DC 20416

Dear Associate Administrator Shepard:

As the appointee leading the Office of Investment and Innovation (OII), your responsibilities include overseeing and executing the Small Business Investment Company (SBIC) program. SBIA again requests you take corrective action to address what appears to the small business investing community to be another breakdown of the SBIC program, particularly the delays with the delivery of licenses.

Today, over four months into the new fiscal year, only one SBIC license has been issued and received by an applicant. This license was issued last week despite being approved by the Agency Committee on November 16, 2018. This single new license is a non-levered SBIC. With more than a third of the fiscal year completed, not a single levered SBIC license has been issued and delivered. This inability to license any levered SBIC funds is confounding because there are several SBIC applicants that also completed SBA's entire licensing process and were approved by the Agency Committee on November 16, 2018. These would-be-SBICs are in limbo and are currently not able to operate and invest in small businesses until SBA issues the licenses.

It is important to also put on the record that the single license issued and the several would-be-licenses-in-limbo are all repeat SBICs with well-established, successful track records in the program. These applicants are extremely well-known to the SBA. Not a single license has been issued to a new SBIC platform in FY 2019. Our industry wants to see more small business investment with more women, more minorities, and more veterans running SBICs. Our industry wants to see more SBIC funds licensed in more geographies – under licensed states and underinvested areas. Our industry wants to see more SBIC funds investing in a broader array of investments in a broader mix of small businesses. How can SBA expect any investing professional, but particularly new entrants to the program who are women, minorities, veterans, or investors from new areas, to take the entrepreneurial risk of forming an SBIC fund when even established and successful SBIC funds are facing unpredictable delays and are struggling to be licensed? Even longtime institutional investors in SBICs, who know the program well, are worried about deploying capital into SBICs that are entering the licensing process because many aspects of the program are now unpredictable and slower than ever.

The government shutdown is not a meaningful cause of these licensing delays. The licenses-in-limbo were approved by the Agency Committee on November 16, 2018. The government did not shut down until December 23, 2018. These licenses should have been issued well before the shutdown. The government reopened on January 25<sup>th</sup>, almost two weeks ago and still there are approved applicants without an SBIC license.

The private sector is having difficulty making sense of the delays. Applicants and their investors can only sit and wait. The civil servants in the Office of Investment and Innovation are not the cause of these licensing delays. By all accounts the civil servants appear to be doing their work professionally and with a sense of purpose. The Agency Committee, composed of both political appointees and civil servants, appears to have done their job and approved applicants for SBIC licenses months ago.

Other parts of the Trump Administration have done an excellent job in promoting small businesses, reducing taxes on small businesses, reducing regulations on small business, and prioritizing capital access to small businesses. The SBIC program is completely in line with the President's goals of supporting small business, promoting investment in domestic companies, and promoting hiring American workers and limiting offshoring of jobs. The SBIA wants to partner with and support this Administration to aid growing small businesses, but the SBIC program must be allowed to function.

On behalf of the small business investing community, the SBIA asks that OII ends these delays and release to the applicants all approved licenses. OII should also prevent these delays from happening in the future. Further, we ask that the SBIC program's other operational issues, not just licensing, be righted so the program can become reliable again. Small businesses, their employees, the private sector investors into SBICs, and SBA's SBIC partners expect a functional Office of Investment and Innovation. SBIA stands ready to assist you in this undertaking in any way that we can.

Sincerely,



Brett Palmer  
President  
Small Business Investor Alliance

CC: Pradeep Belur  
Chris Pilkerton  
Bill Manger  
Nina Levine  
Tim Gribben



February 27, 2019

The Honorable Marco Rubio  
 Chairman  
 U.S. Senate Committee on Small Business  
 & Entrepreneurship  
 428A Russell Senate Office Building  
 Washington, DC 20515

The Honorable Ben Cardin  
 Ranking Member  
 U.S. Senate Committee on Small Business  
 & Entrepreneurship  
 428A Russell Senate Office Building  
 Washington, DC 20515

Dear Chairman Rubio, Ranking Member Cardin, and Members of the Committee:

Thank you for asking questions about the Small Business Investment Company (SBIC) program during the recent oversight hearing of the SBA. When allowed to function, the SBIC program is a powerful catalyst for small business growth and job creation. As a 2017 Library of Congress study revealed, SBIC-backed small businesses created over 3 million new jobs and supported over 6 million more jobs. As the voice of small business investors, we feel it is important to clarify the record of what has been happening with the SBIC program.

Despite strong, pro-small business policies of the broader Trump Administration and the professionalism and dedication of the SBA career staff, for two years there have been serious problems with the management of the SBIC program. Until the day before this hearing, over four months into FY 2019 and through more than one third of the fiscal year, SBA had issued zero SBIC licenses. Less than 24 hours before this oversight hearing, the Office of Investment and Innovation (OII) finally released the first SBIC licenses of the fiscal year. All three licenses were approved by SBA's Agency Committee on November 16, 2018, but the leadership of OII was unable or unwilling to release the SBIC licenses until hours before the Committee's oversight hearing. Until 2017 releasing licenses would have taken 1 to 2 weeks. SBICs are not allowed to operate until they possess the license.

For the past two years, the SBIC program has suffered from ongoing problems that are clearly seen in the licensing process but are also manifest in nearly all facets of the SBIC Program. Where the OII leadership has inserted itself into any SBIC processes, each step of those processes has slowed to near paralysis and the outcomes are at best uncertain. As the association representing small business investors, we have been informing the OII and leadership of the SBA of these emerging problems from very early on, but the problems and the primary cause of these problems persist.

The Chairman asked a good question about SBIC licensing. The SBA Administrator answered honestly with what normally would be the textbook answer of what is supposed to happen. However, it is clear that the information being given to the Administrator, which was then passed on to the Committee in good faith, does not reflect the complete picture. SBIA hopes that this chart will inform the Committee and the leadership of SBA as to what is really happening from the private sector perspective. While it is true that SBIC licensing in FY 2018 increased relative to FY 2017, it is also true FY17 was one of the worst licensing periods in nearly a decade. Licensing was working well in FY 2017 until the Associate Administrator was appointed to oversee the OII.

Licensing returned to near average in 2018, but this too is misleading because given the underperformance and backlog of FY 2017 applicants, the number of licenses should have been much higher in FY 2018. To be clear, time to fundraise is not the reason for the slowdown in licensure, particularly for the funds licensed in FY 2019. SBIA agrees with SBA that technology improvements are needed and will improve some of these issues, but technology alone will not fix the primary cause of the problems at the Office of Investment and Innovation.

	FY 2010-2016	Feb. 1, 2017-Feb. 10, 2019	FY 2019 (SBICs licensed from Oct 1, 2018 through date of Hearing Feb. 13, 2019)
<b>Time for Greenlight Approval for Repeat Funds</b>	Commonly 0.5 Months	Commonly up to 6 Months	Average of 7.25 Months (100% repeat SBICs)
<b>Time to Receive License After Approval by Agency Committee</b>	Commonly 1-2 Weeks	Commonly 1 - 2 Months (sometime more)	3 months
<b>Annual Pace of funds licensed per year</b>	26.4 Licenses Per Year Average (Fewest 21 and highest 34 per year)	Averaging 16 Licenses Per Year for the last 24 months <ul style="list-style-type: none"> <li>• 7 in FY17 (excludes licenses issued by previous Administration in FY 2017)</li> <li>• 25 in FY 2018 (repeat and new SBICs)</li> </ul>	On pace for 9 to 12 licenses (No new platforms licensed as of date of hearing)
<b>Average Time for Licensure</b>	6.6 Months (185 first-time and repeat funds)	SBA reported numbers for FY 2017 are 5.1 months – this number is misleading because more than 50% of licenses issued were issued in a timely manner by the previous Administration (further, this data excludes SBA-caused delays) (includes new and repeat funds)  8.7 Months for FY 2018 (includes new and repeat funds and <i>excludes SBA-caused delays that are omitted from SBA's reported data</i> )  Zero SBICs Licensed from Oct. 1, 2018 through Feb 10, 2019	9.7 months (100% repeat SBICs, which should be much faster to analyze than first time funds)

Source of data 2009-2018 SBA, Source of FY 2019 SBIA (OII appears to have ceased releasing SBIC data for FY 2019)

Licensing is only one area where OII's leadership has broken the efficient and successful operation of this small business investing program. The leadership of the OII has created new uncertainty and delays at every step of the entire SBIC process from pre-licensure to operations to examinations and even to surrendering of licenses. Each of the new delays builds upon the preceding delays. Adding to the delays is the fact that the OII has numerous critical career director, manager, and chief positions that have been vacant for extremely long periods of time, but there has been no attempt by the leadership of the OII to post these open positions for replacement. Attached to this letter is a sample of the private sector's concerns that were submitted to the SBA in the summer of 2018. SBIA has also highlighted these problems in Congressional testimony to the House Small Business Committee with the hope that SBA would address the problem with OII's leadership. This small business program needs your oversight to return it to a fully functional resource for small businesses.

We encourage the Committee and the leadership of the SBA to review these concerns and address them as warranted. This is a program regulating over \$30 Billion in small business investment capital, and it needs competent leadership. As an industry, small business investors want to be working collaboratively with Congress and the SBA to get more SBICs in underserved areas, more equity-oriented SBICs, more investments in rural areas, more women fund managers, more veteran fund managers, and more small businesses growing. Instead our energy must be spent begging SBA to get the most basic functions of the OII to work. The SBIA looks forward to working with Congress and the SBA to better serve and empower growing small businesses with an efficient and functional SBIC program.

Sincerely,



Brett Palmer  
President  
Small Business Investor Alliance

cc U.S. Senate Committee on Small Business & Entrepreneurship  
U.S. Senate Committee on Appropriations  
U.S. House Committee on Small Business  
U.S. House Committee on Appropriations  
SBA Administrator Linda McMahon





April 18, 2019

The Honorable Christopher Pilkerton  
Acting Administrator and General Counsel  
Small Business Administration  
403 3<sup>rd</sup> Street SW  
Washington, DC 20024

Dear Acting Administrator Pilkerton:

The Small Business Investor Alliance (SBIA) is the trade association representing small business investors, the Small Business Investment Companies (SBIC), and limited partners investing via SBICs. As the new Acting Administrator of the Small Business Administration, we would like to draw your attention to the management of the Small Business Investment Company program which is now under your oversight.

The SBIC program is a proven job-creating program driven by the private sector and enhanced by the SBA via leverage. When allowed to function properly the SBIC program increases the capital available to growing small businesses. The SBIC program has not been allowed to function properly since the appointment of Joseph Shepard to run the Office of Investment and Innovation (OII). Through the first two quarters of FY 2019, some of the effects of mismanagement of the SBIC program have been clear and quantifiable. Below is a sampling of the performance through the first half of FY 2019:

- OII has one of the worst SBIC licensing rates in decades (only 4 licenses issued and received).
  - Only 2 SBIC Debenture funds received a license through the first half of the fiscal year.
    - Both licenses delivered immediately prior to Congressional Oversight hearing
  - Only 2 non-levered SBIC funds received a license through the first half of the fiscal year.
    - 1 license delivered immediately prior to Congressional Oversight hearing
  - Only 1 new SBIC platform was licensed (1 of the 2 non-levered funds) through the first half of the fiscal year.
    - License delivered immediately after Congressional inquiry into status of license.
    - No new levered SBIC platforms licensed
- More than 3 times as many SBICs surrendered their licenses than received a license.
  - 14 licenses have been submitted for surrender through the first half of FY 2019.
  - These license surrenders are in legal limbo because they have been pending on Associate Administrator Shepard's desk for up to 6 months, despite having fully paid off all of their leverage to the SBA. There is no justification for these unreasonable administrative delays.



- OII only issued \$690 million in leverage commitments to SBICs.
  - OII is currently on pace to have a 45% decrease (over \$1 Billion less) in SBIC leverage commitments for FY 2019 – down from \$2.5 Billion in FY 2018.
  - This represents billions of dollars in reduced future small business investments.
- No SBIC program data was released until March 30, 2019 - six months after beginning the fiscal year.
  - OII was once able to release this data monthly.
  - The 7a and 504 programs release data weekly or biweekly.
- There have been no SBIC regulations classes held so far this calendar year and there are currently none scheduled for the rest of the year.
  - The last SBIC Regulations class was held in November 2018.
  - SBA requires applicants for SBIC licenses to receive regulations training before being licensed.
  - SBIA has been asking for dates for SBIC regulations classes since the summer of 2018.
  - Outside of force majeure disruptions, it is extremely unusual to go at least a quarter without a regulations class – and it is unheard of that SBA has gone so long without a class. There is no precedent for having zero classes scheduled for the entire calendar year.
  - SBIA is in the final stages of building an online SBIC regulations training (at no expense to the taxpayer).
- OII's budget requests additional funding to study the SBIC program, but still has not released reports that were completed in 2017 and for which the taxpayer has already funded the research.
  - Releasing completed reports and studies before performing duplicative studies would prevent wasting additional taxpayer funds.
- OII's budget request seeks additional funding for 11 new FTE's for risk management.
  - OII has created new additional risks to the program because its leadership has not posted or filled existing, prolonged vacancies in mission critical positions despite having authorities and funding to do so.

I would like to meet with you to discuss how small business investors and SBA can work together to get the SBIC program working again so we can return the focus toward helping small businesses access growth capital.

Sincerely,

A handwritten signature in blue ink that reads "Brett Palmer". The signature is fluid and cursive, with the first name "Brett" and last name "Palmer" clearly distinguishable.

Brett Palmer  
President



Joseph Shepard  
Associate Administrator  
Small Business Administration  
403 3<sup>rd</sup> Street SW  
Washington, DC 20024

Dear Associate Administrator Shepard,

As the person responsible for managing the Small Business Investment Company (SBIC) program, the small business investors feel the need to raise another important issue with you.

As you know, SBIC funds are licensed and regulated by your office, the Office of Investment and Innovation (OII). SBICs have a finite life and are entitled to surrender their license once all SBIC leverage has been paid back. SBIC funds that were never leveraged are able to surrender their licenses at any time. There are more than a dozen SBIC licenses that have paid back all leverage and submitted their licenses for surrender. Some of these surrenders were submitted well over nine months ago, yet they await your acceptance of the surrender. These are unreasonable administrative delays that serve no purpose in helping small businesses, creating jobs, protecting the taxpayer, or benefitting the investors into the SBIC. To the contrary, these arbitrary, capricious, and inexplicable delays add costs to both the taxpayer and the SBIC fund manager, reduce returns to limited partners, and display another general breakdown in the basic operating abilities of the OII. These would-be-surrendered licenses are still accruing not only direct administrative and examination costs, but SBA may also demand exams on these winding down SBICs to delay the processing of new applications or accessing leverage for their other younger active SBIC funds.

The success of this small business program is dependent on basic functions of the program operating in a reasonable and dependable manner, which they are not doing. The inability of SBIC funds to exit the program adds to the current chilling effect on small business investors considering forming a new SBIC fund. It is important to note there are more small business investors trying to surrender their licenses than have been new SBICs licenses issued this fiscal year.

As the trade association representing SBIC funds and their limited partners, we formally ask:

- That you immediately process all license surrenders that have been submitted;
- OII have the surrender documents include an accurate date as to when the surrender was signed and approved by SBA (no backdating);
- OII provide email or other written confirmation to the SBIC of the surrender and the date of approval for the surrender; and
- On a going forward basis, OII process all license surrenders within a two week period.



The small business investors have numerous other concerns about the mismanagement of the SBIC program, but this issue is an issue that can be fully addressed in minutes. Please do so.

Sincerely,

A handwritten signature in blue ink that reads "Brett Palmer". The signature is fluid and cursive.

Brett Palmer  
President

Chairman RUBIO. Mr. Muro.

**STATEMENT OF MARK MURO, SENIOR FELLOW AND POLICY DIRECTOR, METROPOLITAN POLICY PROGRAM, BROOKINGS INSTITUTION, WASHINGTON, DC**

Mr. MURO. Thank you, Chairman Rubio, Ranking Member Cardin, members of the Committee who I assume will see this material otherwise. Thank you for inviting me today.

My expertise revolves around what my group at Brookings Institution calls America's advanced industry sector. More on that in just a sec.

But I want to suggest how the SBIC could be better positioned to support those industries that our particular industry claims we need to talk about. Specifically, I want to urge that the committee explicitly prioritize advanced manufacturing enterprises when it revisits the SBIC's activities in the coming months.

Not all industries matter equally. Indeed, these high-productivity, high-pay innovation industries anchor American competitiveness, and matter inordinately. We need to think about them and nudge the SBA's and the SBIC's services and resources toward support of those.

What are advanced industries? Why do they matter? Brookings defines these industries as those in which the R&D spending per worker reaches the top 20 percent of all industries and the share of workers with significant STEM knowledge exceeds the national average.

We count three energy, 12 service industries, and 35 manufacturing industries. This super sector is dominated by strong advanced manufacturing. Among these 35 manufacturing industries is automaking, aerospace, pharma, medical devices, computers, semiconductors, chemicals and their huge supply chains.

Why do they matter so much? The advanced industries sector encompasses much of the nation's most crucial economic activity. It anchors the traded sector, generates above average productivity, and supports long supply chains. It spreads innovation because its inordinate R&D spending drives product and process innovation, both within enterprises and then through spillovers throughout the economy.

And then this group of industries I am talking about train and employ the nation's STEM workforce. They find them, they locate them, they hire them, they train them both engineering talent but also non-BA technical workers, what we call blue collar STEM.

We can go over a few of the statistics here. They are delivering value, these industries. Advanced industries perform 90 percent of the private sector R&D in our country.

Advanced industries, including advanced manufacturing, are extraordinarily productive. Each worker generated approximately \$250,000 worth of output last year, twice the amount of the other sectors.

And advanced industries punch way above their weight in generating our GDP, \$3.7 trillion worth of output, 18 percent significant. Advanced manufacturing, about 40 percent of that.

The bottom line is this, without a competitive advanced sector, it is going to be simply not possible for the U.S. to maintain global

preeminence, sustained prosperity, and renew national unity. So I want to bring that national imperative into this discussion.

But here is the problem, as we have been hearing, there is now abundant evidence that the primacy of America's advanced industries, and especially its advanced manufacturing sectors being contested and eroding. Slipping U.S. R&D investments, low STEM graduating production, thinning of manufacturing ecosystems is our problem.

So we are going to need to intervene here. But the challenge of finance is a very real additional challenge. Inherent biases of VC and capital resources skew the existing small firm financing system away from these capital intensive manufacturing enterprises.

There is a role to intervene here. Policy should address this.

The SBIC is clearly a useful tool for some of this work and should be further enabled to assist advanced manufacturing concerns in the coming years.

The lack of sectoral specificity in the program and in loan making means that public funds are not always maybe channeled to the highest and best use in this national purpose.

And then we have heard about the repayment structure which begins immediately and is comprised of an SBA annual charge plus interest due, just simply is not conducive to the nature of the long-term product development timelines that advanced manufacturing firms require.

So I endorse several of the ideas that I think are being discussed. Explicit prioritization of advanced manufacturing growth makes a ton of sense and the Committee could provide for more robust and patient capital in SBIC funding.

The SBA should adopt an ethos of investing in the national interest here. It is not just a technical matter. The national interest needs to enter this discussion and I think this Committee has been strong on that.

America's medium- and long-term competitiveness will be heavily influenced by its success in expanding these advanced industries. Success or failure will be determined, meanwhile, by our choices—something I think you have written about—and what we choose to do and not to do in a world of great competition.

So I think working to improve the availability of patient capital for smaller advanced manufacturing firms would be a good choice.

So thank you again for having me.

[The prepared statement of Mr. Muro follows:]

# BROOKINGS

QUALITY. INDEPENDENCE. IMPACT.

## How the Small Businesses Investment Company Program can better support America's advanced industries

Testimony Submitted to  
U.S. Senate  
Committee on Small Business & Entrepreneurship

"Reauthorization of SBA's Small Business Investment Company Program"

June 26, 2019

Mark Muro  
Senior Fellow  
Brookings Institution  
Metropolitan Policy Program

Chairman Rubio, Ranking Member Cardin, and Members of the Committee:

Thank you for inviting me to testify today on the reauthorization of the Small Business Administration (SBA) and particularly on the Small Business Investment Company (SBIC) program.

My expertise revolves around what my group at Brookings calls America's advanced industry sector, and so my priority today is to suggest that the SBIC should be better positioned to further support the sector.

Specifically, I want to urge that the committee explicitly prioritize advanced manufacturing enterprises when it revisits the SBIC's activities during the broader reauthorization process.

Because not all industries matter equally to America's prosperity. Indeed, these high-productivity, high-pay innovation industries anchor American competitiveness, and matter inordinately to the nation's prosperity.

For that reason, it would be extremely appropriate and helpful if the SBA reauthorization would as much as possible nudge the SBA's—and the SBICs'—services and resources

toward the support of advanced industry growth and competitiveness, particularly at a time of renewed economic nationalism in the world.

To argue this, I would like to provide three sets of comments, touching on:

- What advanced industries are and why they matter
- Why they need government financial support
- What such support might look like

### **AMERICA'S ADVANCED INDUSTRIES: WHAT THEY ARE AND WHY THEY MATTER**

What are advanced industries, and why do they matter? Characterized by their heavy use of technology and technical workers, advanced industries represent the prime site in developed economies for the conversion of technical invention into industrial-scale business enterprise. In short, these industries anchor American prosperity.<sup>1</sup>

Brookings defines advanced industries as those in which R&D spending per worker reaches the top 20 percent of all industries and the share of workers with significant STEM knowledge exceeds the national average.

Based on this definition, the U.S. advanced industries sector encompasses 50 diverse industries, including 3 energy, 35 manufacturing, and 12 service industries. These prime industries include manufacturing industries such as automaking, aerospace, pharmaceuticals, and semiconductors; energy industries such as oil and gas extraction and renewables; and critical service activities such as R&D services, software design, and telecommunications.<sup>2</sup>

#### **Defining Advanced Industries**

Individual advanced industries are identified using two criteria:

- An industry's R&D spending per worker must fall in the 80th percentile of industries or higher, exceeding \$450 per worker
- The share of workers in an industry whose occupations require a high degree of STEM knowledge must also be above the national average, or 21 percent of all workers

An industry must meet both criteria to be considered advanced.

<sup>1</sup> Much of the following discussion reflects the definitions, analyses, and strategic framework of Mark Muro, Jonathan Rothwell, Scott Andes, Kenan Fikri, and Siddharth Kulkarni, "America's Advanced Industries: What They Are, Where They Are, and Why They Matter" (Washington: Brookings Institution, 2015) as well as Mark Muro and others, "America's Advanced Industries: New Trends." (Washington: Brookings Institution, 2016).

<sup>2</sup> For more information on which industries are considered advanced industries, and a complete methodology on selecting those industries, see Muro and others, "America's Advanced Industries."



The 50 Industries That Constitute the Advanced Industries Sector		
<b>MANUFACTURING</b>		<b>ENERGY</b>
Aerospace products and parts	Motor vehicles	Electric power generation, trans., and distribution
Agr., construction, and mining machinery	Navigation, measurement, and control instruments	Metal ore mining
Aluminum production and processing	Other chemical products	Oil & gas extraction
AV equipment	Other electrical equipment and components	<b>SERVICES</b>
Basic chemicals	Other general-purpose machinery	
Clay products	Other misc. manufacturing	
Commercial & service industry machinery	Other nonmetallic mineral products	
Communications equipment	Other transportation equipment	
Computers and peripheral equipment	Pesticides, fertilizers, and other agr. chemicals	
Electric lighting equipment	Petroleum & coal products	
Electrical equipment	Pharmaceuticals and medicine	
Engines, turbines, & power trans. equip.	Railroad rolling stock	
Foundries	Resins and synthetic rubbers, fibers, and filaments	
Household appliances	Semiconductors and other electronic components	
Industrial machinery	Ship and boat building	
Iron, steel, and ferroalloys	Medical equipment and supplies	
Motor vehicles bodies & trailers	Reproducing magnetic and optical media	
Motor vehicle parts		

Why do advanced industries matter so much to society and for the broader economy? At the most immediate level, the advanced industries sector has transformed lives.

Working often with university and public-sector laboratories, advanced industries have facilitated the most significant societal breakthroughs and human achievements, from putting a human on the moon to building out the mobile internet for billions of the globe's citizens. Likewise, advanced industries have made useful advances such as GPS and Alexa commonplace, delivered blockbuster biotech drugs, and driven forward revolutions such as "fracking," "cybersecurity" applications, and artificial intelligence that are changing the balance of power in the world. In short, the advanced industries sector looms large in supporting such national and global objectives as national security, energy independence, food sustainability, health, and rising standards of living

But the advanced industries sector also represents a compelling economic and competitive fact. As the leading location of technological development and its application in the United States, advanced industries are in many respects the nation's core sources of prosperity and economic preeminence. Specifically, the advanced industries sector:

- **Encompasses many of the nation's most crucial industries.** Advanced industries embody economic dynamism. As a group these industries determine U.S. economic prosperity and power. For example, advanced industries generate above-average productivity, which is a leading predictor of worker wages. Likewise, because of the complexity of their products, these industries support long supply chains throughout the U.S. economy. That, combined with their high pay, ensures that advanced industries have high employment and output multipliers—measures of the economic activity that one job spurs elsewhere in the economy. Furthermore, nearly every advanced industry resides in the traded

sector—the sector that competes internationally, sells abroad at least partially, and returns revenue to America.

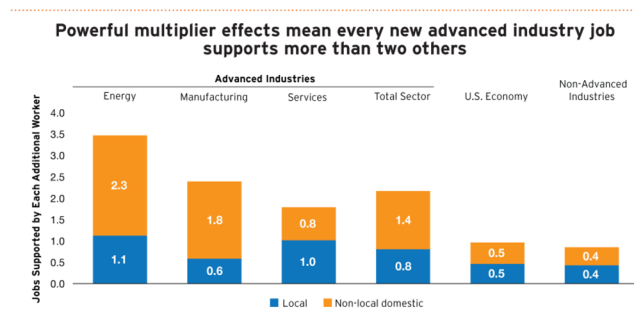
- **Represents a key site of innovative activity.** Related to their orientation toward key national challenges is the fact that advanced industries are the nation's principle locus of industrial innovation. Innovation matters to nations, states, regions, companies, and families because it represents the only viable avenue for high-wage economies to increase productivity and continue to improve their citizens' standard of living. Advanced industries matter inordinately because they draw together society's innovation resources and serve as the primary site of the R&D spending that drives product and process innovation in the economy. What's more, advanced industry innovation investments, activities, and advances "spill over" to other areas as well. They radiate. And in some cases, advanced industry technologies have emerged as "general purpose technologies" that have enabled truly significant productivity advances throughout the economy. This can be seen in areas such as the genomic revolution, the arrival of advanced material science, and emerging new developments in advanced robotics and artificial intelligence.
- **Trains and employs much of the nation's STEM workforce.** The sector also factors significantly in building and maintaining the nation's technical workforce. A storehouse of the nation's STEM knowledge base, the sector also serves as a critical repository of skilled workers. STEM workers matter because they make and apply the inventions that sustain innovation and growth. At the professional level, highly trained engineers and scientists keep American business on the cutting edge through invention and entrepreneurship. At the sub-bachelor's level, skilled technicians produce, install, maintain, and repair the products and machines that allow firms to reach their markets, reduce product defects, create process innovations, and enhance productivity. STEM workers also introduce STEM skills into other industries, including management and professional services, finance, and health care, thus contributing to the retraining and upskilling of workers throughout the rest of the economy. In that sense, the impact of advanced industries again radiates outward through the economy.

Along these lines, the sector—including especially its sizable advanced manufacturing sub-sector—delivers critical, specific, underrecognized value to the nation and its people and places:

- **Employment.** As of 2018, the 50 advanced industries in the United States employed 14 million U.S. workers, or nearly 10% of total employment. Of that, the 35 advanced manufacturing industries contributed 5.7 million jobs and 4% of U.S. employment.
- **GDP.** And yet, even with this relatively modest employment base, U.S. advanced industries generate \$3.7 trillion worth of output annually, or 18.5% of U.S. GDP

in 2018. Again, advanced manufacturing was a particularly sizable contributor of \$1.4 trillion worth of U.S. output.

- **Productivity.** Workers in advanced industries are extraordinarily productive. Each worker generated approximately \$260,000 worth of output compared with \$120,000 for the average worker outside advanced industries.<sup>3</sup> For the advanced manufacturing sub-sector the figure is \$250,000.
- **Pay.** In 2018, the average advanced industries worker earned \$103,000 in total compensation, double the \$51,000 earned by the average worker in other sectors. And real absolute earnings in advanced industries grew by 63 percent between 1975 and 2013, compared with just 17 percent for other workers. In advanced manufacturing concerns pay is lower, but still superior to the national average in other sectors at \$86,000 annually.
- **Multipliers.** Every new advanced industry job creates 2.2 jobs domestically—0.8 jobs locally and 1.4 jobs outside of the region. For advanced manufacturing the figures are 0.6 local jobs and a hefty 1.8 positions elsewhere. On average in other industries, new jobs create only one additional domestic job—0.4 jobs locally and 0.6 jobs outside the region.



- **Innovation.** Advanced industries perform 90% of all private-sector R&D and develop approximately 82% of all U.S. patents.

Beyond these aggregate contributions, advanced industries have a distinct geography across the U.S. and different industries play a role in different regions. Advanced manufacturing, in particular, plays a significant role in combatting regional inequality, and supporting America's left-behind places in an era of regional divergence driven by

<sup>3</sup> These figures are derived from estimates produced by Emsi Inc.

“winner-take-most” digital technologies.<sup>4</sup> This is because the 35 advanced manufacturing industries are the most prevalent set of advanced industries in the U.S. Heartland, which have, in recent years, been particularly hard hit by the effects of globalization, automation, and deindustrialization.<sup>5</sup> As a result, vibrant advanced manufacturing industries will be particularly important in the coming years to maintaining dignified work in the Midwest and South, mitigating regional inequality, supporting national unity, and enhancing aggregate well-being nationwide.

Together, then, these trends confirm the importance to national wellbeing of both advanced industries in general and especially its advanced manufacturing segment. Without a globally competitive advanced sector it will simply not be possible for the U.S. to maintain its global preeminence, maintain a vibrant national economy, or to restore faith in the nation’s promise of success through dignified work in the Heartland.

#### **AMERICA’S ADVANCED INDUSTRIES: WHY THEY NEED SUPPORT, INCLUDING IMPROVED FINANCE**

And yet, there is now abundant evidence that the primacy of America’s advanced industries, and especially its advanced manufacturing sector, is being aggressively contested—and eroding. In a world of state competition for valuable industries, competitor industries want for themselves the kind of high-value production epitomized by the U.S. advanced industries / advanced manufacturing sector, and so they are competing to build and expand such sectors in their own right.<sup>6</sup>

What’s more, these challenges are succeeding—most notably as demonstrated by China’s ability, since its accession to the World Trade Organization (WTO) in 2001, to capture leading positions on global economic rankings previously held by the U.S., including total trade, goods exports, and global market share of high-value capital goods.<sup>7</sup> Especially telling is that the U.S. has since 2000 run negative trade balances with both China and the world on advanced technology products, with the deficit continuing to grow.<sup>8</sup>

What do these challenges to U.S. leadership look like operationally? As epitomized by China, competitor nations are accelerating their investments in the key inputs to advanced-sector competitiveness—basic and applied research and development (R&D), STEM worker development, regional supply chain deepening—just as the U.S. commitment has weakened.

<sup>4</sup> See Clara Hendrickson, Mark Muro, and William Galston, “Countering the Geography of Discontent: Strategies for Left-Behind Places.” (Washington: Brookings Institution, 2018).

<sup>5</sup> Mark Muro and others, “The State of the Heartland: Factbook 2018.” (Washington and Bentonville: Brookings Institution and Walton Family Foundation, 2018).

<sup>6</sup> Project for Strong Labor Markets and National Development, “Made in China 2025 and the Future of American Industry.” (Washington: U.S. Senate Committee on Small Business and Entrepreneurship, 2019).

<sup>7</sup> Project for Strong Labor Markets and National Development, “Made in China 2025.”

<sup>8</sup> Christian Zimmermann, “The high-tech trade balance: Importing and exporting U.S. aerospace, nuclear, and weaponry technology.” *The FRED Blog*, May 21, 2018.

As a result, the future competitiveness of the U.S. advanced industries sector has become uncertain because the United States is losing ground on important measures of advanced industry competitiveness.

On innovation, for example, the U.S. share of global patenting and R&D is falling much faster than its share of global GDP and population. While the U.S. lost 1.6 percentage points in its share of world population between 1981 and 2016, its shares of global patenting and R&D spending both fell by over 15 percentage points.<sup>9</sup> This indicates that other countries are catching up with, or have surpassed, the U.S. on creating the types of new technologies that generate economic growth, national power, and citizen wellbeing.

Similarly, the United States increasingly lacks the skills base needed to sustain advanced industry competitiveness. For example, the United States ranks a distant 33rd in terms of the percentage of its graduates majoring in STEM fields, with just 17 percent of graduates choosing majors in science, computer science, or engineering.<sup>10</sup> In Germany, meanwhile, nearly 37 percent of university students graduate with such a degree.

And for that matter, Brookings research from a few years ago suggests that that the nation's regional advanced industries ecosystems have been losing supply-chain density to the detriment of manufacturing growth. According to the analysis, the number of the nation's largest 100 metropolitan areas that had at least 10 percent of their workforce in advanced industry employment had dwindled from 59 in 1980 to no more than 23 in this decade—this at a time of rapid Asian ecosystem growth.<sup>11</sup>

But these are just brief instances of the kind of weakened U.S. assertiveness that has eased China's and other nations' moves up the advanced-sector value chain relative to America.

Also essential and more pertinent to today's discussion is the matter of finance.

At a moment when the "Made in China 2025" industrial policy implies direct support to thousands of firms through state funding, low-interest loans, tax breaks, and other subsidies to the tune of hundreds of billions of dollars according to third-party estimates, U.S. advanced manufacturing firms—especially smaller ones—struggle to access affordable capital.<sup>12</sup>

Central to this problem is the fact that, while the United States has the most developed venture capital (VC) system in the world, that system remains difficult to access for

<sup>9</sup> World Bank, Population total, <https://data.worldbank.org/indicator/SP.POP.TOTL>; OECD Gross domestic spending on R&D, <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>; OECD Patents by technology, [https://stats.oecd.org/Index.aspx?DataSetCode=PATS\\_IPC](https://stats.oecd.org/Index.aspx?DataSetCode=PATS_IPC).

<sup>10</sup> OECD, Science, Technology and Industry Scoreboard (2017), [https://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2017\\_9789264268821-en](https://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2017_9789264268821-en).

<sup>11</sup> Mark Muro and Siddharth Kulkarni, "Reshoring: Why Its Not Easy," *The Avenue*, Oct. 3, 2014.

<sup>12</sup> James McBride and Andrew Chatzky, "Is 'Made in China 2025' a Threat to Global Trade?" (Washington: Council on Foreign Relations, 2019). See also European Union Chamber of Commerce in China, "China Manufacturing 2025: Putting Industrial Policy Ahead of Market Forces." (Beijing: 2017).

manufacturing firms. Specifically, the capital-intensive nature of manufacturing concerns in general, and especially of smaller innovation-oriented manufacturing enterprises, activate thorny market problems that won't likely dissipate on their own.

Most notably, **the natural biases of VC and other capital sources skew the existing small-firm finance system far away from capital-intensive manufacturing enterprises** and are leaving them to face a debilitating lack of access to critical finance in the United States.<sup>13</sup>

In this connection, innovative firms engaged in complex, advanced manufacturing production require greater capital and more time to make a profit than non-production firms.<sup>14</sup> However, a serious market problem intrudes because most existing small-firm finance sources (especially venture capital) default to the low-risk, high-reward nature of digital start-ups and stay away from the longer profit horizons of manufacturing.

"Tech" companies, after all, can produce fast-turnaround, consumer-facing products with little-to-no physical infrastructure. Advanced manufacturing firms, by contrast, require much more time, risk, and capital to develop products, bring them to market, and achieve scale, ensuring they get fewer VC opportunities. Moreover, while advanced manufacturing firms can sometimes locate financing for the earlier stages of their development (e.g. prototyping), they face more difficulty when they seek financing for large-scale production and commercialization. In other words, just as they become consequential, a lack of patient capital undercuts their ability to scale up impact.

In sum, acute capital shortfalls are likely hobbling the ability of smaller advanced manufacturing concerns to grow their operations, contribute to local supply-chain deepening, and enhance U.S. competitiveness, community by community. To the extent smart national policy can nudge more financial support towards advanced manufacturing enterprises, it will address a troubling market problem in America's manufacturing ecosystem and push back against industrial drift.

Policymakers should seek opportunities wherever they can to improve the finance environment for these firms.

#### **AMERICA'S ADVANCED INDUSTRIES AND THE SBIC**

The SBIC, meanwhile, offers the ideal tool for this work and should be further enabled to assist advanced manufacturing concerns in the coming years.

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<sup>13</sup> Jonathan Gruber and Simon Johnson, *Jumpstarting America: How Breakthrough Science Can Revive Economic Growth and the American Dream*, (New York: Public Affairs, 2019).

<sup>14</sup> Elisabeth Reynolds, Hiram Samel, and Joyce Lawrence, "Learning by Building: Complementary Assets and the Migration of Capabilities in U.S. Innovation Firms." MIT Industrial Performance Center Working Paper, March 2013.

The SBIC's current portfolio, in fact, suggests it is well-positioned to invest even more actively in advanced manufacturing. Indeed, roughly a quarter of SBIC financing dollars already go to such concerns already.<sup>15</sup>

With that said, however, the SBIC program as it exists today contends with several limitations that prevent it from investing as helpfully in growth as it might.

First, the lack of sectoral specificity in SBIC loan-making means that public funds are not always channeled toward the highest public benefit—most notably that of advanced industries.

Second, its repayment structure, which begins immediately and is comprised of an SBA annual charge plus interest due semiannually, is not conducive to the nature of the longer-term product development timelines that advanced manufacturing firms require. In general, the SBIC's offerings are not “patient” enough to optimally support advanced manufacturing business models.

So how can SBIC help fill the void? To maximize the program's benefit to U.S. competitiveness through the support of U.S. advanced industries, policymakers should:

- **Explicitly prioritize advanced manufacturing growth in the SBIC's equity capital toolbox.** Currently advanced-sector production enterprises are not specifically mentioned in program policies and criteria. They should be, because as of now they are losing out. Accordingly, the committee should amend the Small Business Act to create within the existing SBIC a program that will offer preferred financing terms to VC firms that invest in advanced manufacturing firms. To determine eligibility for participation in this funding activity, manufacturers' “advanced” status could be confirmed by their location in designated NAICS codes, employing the same definitional methodology and industry list as employed in this testimony. (See the Appendix for a full-list of advanced industries, their NAICS codes, and basic employment and output data).
- **Encourage robust and patient capital in SBIC funding.** Currently the program favors low-risk, high-reward, relatively short-term enterprises, which discriminates against advanced manufacturing concerns. That too should be adjusted because it mitigates against the national interest of expanding the advanced industry sector. Funding, therefore, should be growth-oriented, as much as possible—not time-bound. Changes can include tying repayments to a percentage royalty from sales, as well as denoting full repayment as a multiple of the original loan amount, rather using the current fixed payment-plus-interest model.

Nor is this an over-intrusive case of picking winners. Rather, it is a matter of making the valuable financial supports of the SBIC program available to a sector of national priority

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<sup>15</sup> U.S. Small Business Administration, “The Small Business Investment Company (SBIC): Annual Report 2014.” Washington.

that cannot now fully access them. Nor are such policies without precedent: Israel, as one example, provides a state guarantee of commercial bank loans to firms, including advanced manufacturing firms, that are aiming to scale-up.<sup>16</sup> Likewise, numerous countries in Europe and Asia have, over the past decade and beyond, pursued active policies that align government, industry, and infrastructure into comprehensive technology-based ecosystems.<sup>17</sup>

In short, the SBA should adopt an ethos of investing in the national interest for the SBIC program.

## CONCLUSION

Chairman Rubio, Ranking Member Cardin, members of the committee:

America's medium- and long-term competitiveness and economic prosperity will be determined by success in a few select, but significant, industrial sectors: namely, the nation's advanced manufacturing, energy, and digital industries.

Success or failure there, meanwhile, will be determined by our choices, both what we choose to do and choose not to do, in world of state competition for valuable industries.

Fortunately, one tool for which we can make good choices is the SBA's SBIC program. Given its important role in enterprise finance, it is well worth the time and effort to make sure it is optimized to serve as a tool for national competitiveness.

If rigorously targeted to investment in America's advanced manufacturing sector, it will absolutely help us reassert national competitiveness, support vibrant communities, and promote dignified work.

Thank you again for inviting me. I look forward to discussing these issues with you.

*The author would like to thank Rob Maxim, Jacob Whiton, and Anthony Fiano for help with preparing this testimony.*

*The views expressed in these written remarks are those of the author alone and do not necessarily represent those of the staff, officers, or trustees of the Brookings Institution.*

*For additional information, including definitional details on advanced industries and extensive federal, state, and metropolitan-area data, see the Brookings Institution report "America's Advanced Industries: What They Are, Where They Are, and Why They Matter" which is here: [www.brookings.edu/research/americas-advanced-industries-what-they-are-where-they-are-and-why-they-matter/](https://www.brookings.edu/research/americas-advanced-industries-what-they-are-where-they-are-and-why-they-matter/)*

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<sup>16</sup> See David Adler, "Financing Advanced Manufacturing: Why VCs Aren't the Answer," *American Affairs*, May 2019.

<sup>17</sup> Gregory Tassey, "Rationales and mechanisms for revitalizing US manufacturing R&D strategies" (National Institute of Standards and Technology, 2010).



**Appendix: The 50 Advanced Industries**

NAICS Code	Industry Title	R&D per Worker (2009)	STEM worker share (2012)	Jobs (2018)	Output (\$mil) (2018)
<b>MANUFACTURING</b>					
3241	Petroleum and Coal Products	\$693	41.7%	112,647	\$129,117
3251	Basic Chemical	\$14,679	50.4%	150,343	\$105,122
3252	Resins and Synthetic Rubbers, Fibers, and Filaments	\$11,110	46.3%	93,056	\$32,143
3253	Pesticide, Fertilizer, and Other Agr. Chemical	\$33,109	42.7%	35,691	\$18,946
3254	Pharmaceutical and Medicine	\$143,110	47.5%	293,219	\$135,002
3259	Other Chemical Product and Preparation	\$45,778	29.4%	83,936	\$18,441
3271	Clay Product and Refractory	\$6,308	30.1%	38,920	\$4,558
3279	Other Nonmetallic Mineral Product	\$4,558	21.9%	79,382	\$15,572
3311	Iron and Steel Mills and Ferroalloy	\$2,705	29.3%	82,551	\$22,638
3313	Alumina and Aluminum Production and Processing	\$4,329	32.2%	58,168	\$8,146
3315	Foundries	\$1,372	36.4%	118,321	\$12,773
3331	Agriculture, Construction, and Mining Machinery	\$11,709	39.2%	213,618	\$33,883
3332	Industrial Machinery	\$23,672	50.0%	118,202	\$18,941
3333	Commercial and Service Industry Machinery	\$13,330	42.2%	91,753	\$12,090
3336	Engine, Turbine, and Power Trans. Equipment	\$13,557	44.6%	98,055	\$17,611
3339	Other General Purpose Machinery	\$5,293	41.7%	267,352	\$42,431
3341	Computer and Peripheral Equipment	\$60,339	71.4%	158,035	\$44,214
3342	Communications Equipment	\$91,428	57.2%	85,481	\$28,218
3343	Audio and Video Equipment	\$28,074	32.1%	20,087	\$3,602
3344	Semiconductor and Other Electronic Component	\$49,612	50.2%	368,535	\$87,463
3345	Navigational, Measurement, and Control Instruments	\$14,265	57.6%	405,847	\$127,902
3346	Magnetic and Optical Media	\$5,919	28.4%	13,399	\$2,913
3351	Electric Lighting Equipment	\$821	27.5%	47,400	\$6,158
3352	Household Appliance	\$821	27.1%	63,370	\$9,757
3353	Electrical Equipment	\$821	37.4%	139,757	\$18,533
3359	Other Electrical Equipment and Components	\$821	37.1%	143,311	\$25,842
3361	Motor Vehicles	\$48,461	27.1%	232,446	\$84,813
3362	Motor Vehicle Bodies and Trailers	\$759	22.5%	163,815	\$14,397
3363	Motor Vehicle Parts	\$6,791	36.0%	596,690	\$71,272
3364	Aerospace Product and Parts	\$20,501	59.9%	496,520	\$129,506
3365	Railroad Rolling Stock	\$2,782	32.4%	22,389	\$5,022
3366	Ship and Boat Building	\$4,640	39.1%	137,052	\$14,234
3369	Other Transportation Equipment	\$13,476	29.9%	33,844	\$8,210
3391	Medical Equipment and Supplies	\$24,343	32.7%	314,489	\$60,006
3399	Other Miscellaneous	\$8,547	23.0%	288,565	\$33,140
<b>ENERGY</b>					
2111	Oil and Gas Extraction	\$613	58.5%	142,655	\$184,951
2122	Metal Ore Mining	\$836	47.5%	41,083	\$17,785

2211	Electric Power Generation, Trans. and Distribution	\$2,173	46.9%	390,778	\$257,844
<b>SERVICES</b>					
5112	Software Publishers	\$80,977	70.3%	398,679	\$193,011
5152	Cable and Other Subscription Programming	\$1,370	36.1%	53,534	\$46,133
5173	Wired and Wireless Telecommunications Carriers	\$455	40.2%	668,476	\$317,629
5174	Satellite Telecommunications	\$5,948	68.9%	8,673	\$1,685
5179	Other Telecommunications	\$1,999	57.3%	80,810	\$17,683
5182	Data Processing and Hosting	\$1,020	56.2%	327,244	\$140,905
5191	Other Information	\$27,476	40.1%	301,787	\$201,645
5413	Architectural, Engineering, and Related	\$738	74.1%	1,456,900	\$196,319
5415	Computer Systems Design and Related	\$7,225	75.0%	2,098,203	\$348,818
5416	Mgmt., Scientific, and Technical Consulting	\$1,950	38.7%	1,456,802	\$219,108
5417	Scientific Research and Development	\$13,627	72.8%	679,893	\$127,544
6215	Medical and Diagnostic Laboratories	\$988	49.8%	273,895	\$32,644
<b>Advanced manufacturing industries</b>		—	—	<b>5,666,249</b>	<b>\$1,402,615</b>
<b>Advanced energy industries</b>		—	—	<b>574,515</b>	<b>\$460,580</b>
<b>Advanced services industries</b>		—	—	<b>7,804,895</b>	<b>\$1,843,123</b>
<b>Advanced Industries total</b>		—	—	<b>14,045,659</b>	<b>\$3,706,317</b>

*Source: Brookings analysis of NSF, BLS, and Emsi data*

Chairman RUBIO. Dr. Pan.

**STATEMENT OF BANU ÖZKAZANÇ-PAN, PH.D., ASSOCIATE PROFESSOR OF MANAGEMENT, UMASS BOSTON AND VISITING ASSOCIATE PROFESSOR OF SOCIOLOGY, BROWN UNIVERSITY, BOSTON, MA**

Ms. ÖZKAZANÇ-PAN. Thank you.

Chairman Rubio, Ranking Member Cardin, and Members of the Committee, thank you for the opportunity to testify here today.

In addition to my very long title, I am the founding director of the Venture Capital Inclusion Lab at Brown University and happy to speak further about some of the work that we are doing.

Today, I will provide a broad overview of the VC industry and then go on to discuss the specifics as they relate to women and minorities.

The VC industry last year saw record growth in investments. Last year, the industry invested around \$130.9 billion across 8,948 deals and raised \$55.5 billion across 256 funds, representing record amounts compared to the dot com boom era.

During this time, around 62 percent of total invested capital was due to deals sized \$50 million or larger. VC mega-funds, or those raising \$500 million or more, accounted for 57 percent of all capital raised. These large funds were partially supported by the involvement of private equity and corporate VC investments.

During this time, we saw that both deal size and valuations grow, particularly in early stages. Right now, \$25 million deals or larger now represent almost 62 percent of all early stage deals by value. However, whether the pace of such investment activity is sustainable continues and needs to be seen.

There is some concern about the amount of available capital and whether it is being deployed efficiently. In addition, the majority of VC investments go to pharma, biotech, and software industries with software representing the largest single sector for VC money.

Despite the growth of VC investments, the situation for women and minorities is quite different. On the investor side, a 2017 report by TechCrunch found that women represented 8 percent of all partners in top 100 VC firms. Only 1 percent of survey's 713 VC firms had Black decisionmakers, coming out with a whopping 7 individuals, while Hispanic decisionmakers were represented at 1.5 percent and Asians at 24 percent. Overall, 85 percent of decisionmakers in the U.S. VC industry are male and 73 percent are white.

On the entrepreneur side, less than 1 percent of Black women receive VC funding and startups with a female CEO have received only 2.7 percent of all VC money.

We see that all male teams represent 82 percent of all VC-backed startups. Blacks represent 1 percent, Latinos around 2 percent, and Asians around 18 percent. In general, Whites represent about 77 percent of all VC-backed companies.

Despite these challenging facts, 40 percent of all current businesses in the U.S. are women-owned. These businesses have been growing at impressive rates. Between 2007 and 2018, women-owned businesses grew at 58 percent compared to 12 percent growth across all businesses. Women of color-owned businesses grew an impressive 163 percent during the same time.

Despite this growth, revenues generated by women of color-owned businesses have dropped between 2007 and 2018 by 21 percent, whereas non-minority-owned business revenue grew by 17. Research shows that if revenues generated by minority women-owned businesses matched those currently generated by all women-owned businesses, they would add 4 million additional jobs and \$1.4 trillion in revenues to the U.S. economy.

Similarly, if minority-owned businesses were at entrepreneurial parity, the U.S. would gain 1.9 million firms, 13.2 million more employees, and an additional \$2.9 trillion in gross receipts.

The challenges are taking place at a historic moment. The U.S. is changing in terms of demography and this will mean new consumers, markets, and opportunities will emerge. At the same time, increased global competition requires investments to make the U.S. economy strong and competitive.

SBICs can provide these investments and can be even stronger in terms of employment and job creation.

New programs, such as on-ramps for women and minority fund managers and investors can boost the already better than industry numbers for gender and racial diversity in SBICs. They can allow expanded deal flow options and networks and move away from some of the group think and pattern matching that allowed the VC industries to fund companies like Theranos. They can take advantage of new customer segments and consumer needs that can be served through diverse firms.

By investing in industries beyond those associated with traditional VC funding, we can build a sufficiently diversified economy. And by continuing to fill the gaps in capital resulting from mega-deals in the VC community, we can expand opportunity across geography, gender, and race.

Thank you.

[The prepared statement of Ms. Özkazanç-Pan follows:]



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#### Statement of Record

U.S. Senate Committee on Small Business & Entrepreneurship  
 Reauthorization of SBA's Small Business Investment Company Program

by Prof. Banu Özkazanc-Pan, Ph.D  
 Associate Professor of Management, University of Massachusetts  
 Visiting Associate Professor of Sociology, Brown University

June 26, 2019

Good afternoon Chairman Rubio, Ranking Member Cardin and members of the Committee on Small Business and Entrepreneurship, my name is Banu Ozkazanc-Pan. I'm an associate professor of management at the University of Massachusetts and a visiting associate professor of sociology at Brown University. Over the course of my career, I have examined diversity and inclusion in the context of organizations and entrepreneurship. With grant funding from the Ewing Marion Kauffman Foundation, I've had the opportunity to examine entrepreneurial ecosystems in different U.S. cities to understand inclusion dynamics. Recent grant-funded research has focused on the venture capital industry and helped support the founding of the Venture Capital Inclusion Lab at Brown University's Jonathan M. Nelson for Entrepreneurship. The Lab, in partnership with Crunchbase and Aleria Tech, continues to examine industry dynamics in venture capital, focusing on issues of decision-making, networking and deal flow among other considerations. My testimony here today will provide an overview of the venture capital industry, speak to challenges facing women and minorities as investors and as entrepreneurs and examine the importance of achieving diversity and inclusion for the U.S. economy based on emergent trends and research. Thank you for the opportunity to share my research and contribute to this hearing.

#### State of the Venture Capital Industry

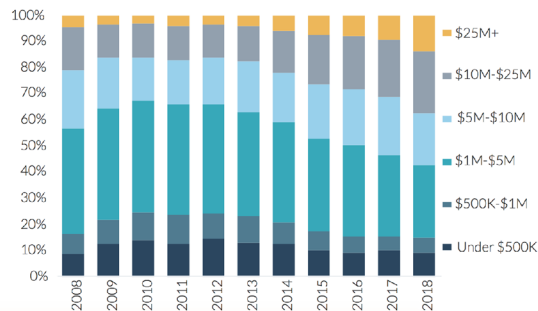
In 2018, the venture capital (VC) industry invested around \$130.9 billion across 8,948 deals and raised \$55.5 billion across 256 funds, representing record amounts compared to the dot com boom<sup>1</sup>. During this time, angel and seed investments declined while around 62% of total invested capital was due to deals sized \$50 million or larger. Venture capital mega-funds, or those raising \$500 million or more, accounted for 57% of all capital raised. Unicorn firms, or those with valuations of \$1 billion or more, captured around 34% of all

<sup>1</sup> [https://files.pitchbook.com/website/files/pdf/4Q\\_2018\\_PitchBook\\_NVCA\\_Venture\\_Monitor.pdf](https://files.pitchbook.com/website/files/pdf/4Q_2018_PitchBook_NVCA_Venture_Monitor.pdf)

venture capital investments, raising \$44.5 billion. This period was also marked by large deal sizes particularly in the early stages and higher firm valuations. In fact, at least half of early stage deals were valued at \$5 million or more (see figures below<sup>2</sup>).

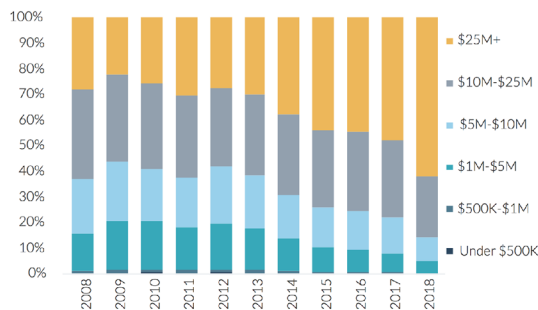
*Nearly half of early-stage deals sized at least \$5M*

US early-stage deals (#) by size



*\$25M+ deals now make up 61.2% of deals by value*

US early-stage deals (\$) by size



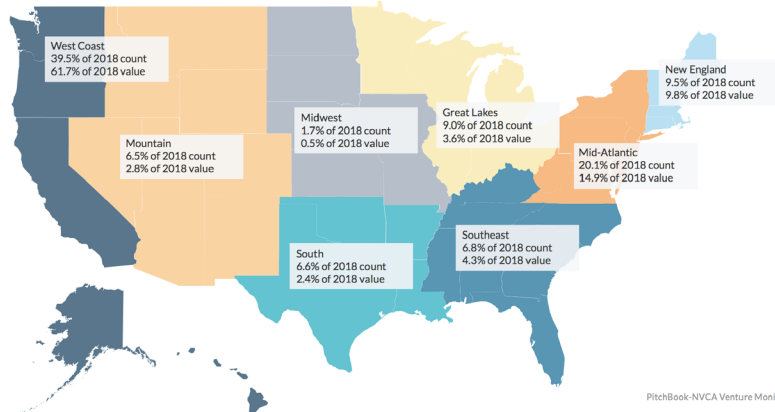
Both private equity and corporate VC also had a highly active year, investing in 792 and 1,443 deals respectively in mostly later-stage, large venture deals. Late-stage venture capital investments also saw impressive growth. Around 200 mega-deals (those over \$100 million) resulted in the investment of \$62 billion during this time. These mega-funds coupled with the trend of raising more VC rounds allows companies that want to remain backed by VC funds to do so for longer periods of time compared to previous years. 2018 also saw focused investments in pharma, biotech and software as the largest proportion of

<sup>2</sup> *ibid*, page 13

investments by VCs with software seeing record levels of capital investment (around 42% of all investments). Lastly, geography continues to be an important element of VC investments with West coast leading both in terms of count and value (see figure below<sup>3</sup>)

#### *VC hubs outside Silicon Valley see greater proportion of VC*

US VC deals by region (2018 total)



#### **State of the Venture Capital Industry for Women and Minorities**

A 2017 report<sup>4</sup> by TechCrunch using Crunchbase data found women represent 8% of all partners in the top 100 venture firms (determined through their longevity, recent investment activity, number and size of funds led). Notably, women now represent 15% of all partners at accelerator and corporate venture firms. Between 2012 and Q3 2017, around 10% of all venture dollars went to start-ups with at least one female founder. The findings also suggest that between 2009 and 2017, the percentage of funded start-ups with at least one female founder increased from 9% to 17%. In examining whether firms with female investing partners are more likely to invest female founders, the research found no clear correlation over the long run but did find there are particular firms with female investors that have invested in women founded or co-founded firms at higher rates. The research also determined that new investment firms started by women investors are more likely to invest in start-ups with women founders. Going forward, these firms represent potential positive changes towards more funding of women founded or co-founded firms as well as an increase in the number of women investors in the VC industry.

<sup>3</sup> *ibid*, page 17

<sup>4</sup> <https://news.crunchbase.com/news/announcing-2017-update-crunchbase-women-venture-report/>

At the same time, a report<sup>5</sup> examining nearly 10,000 founders, 4,475 start-ups and 135 of the most active venture capital firms by RateMyInvestor and Diversity VC found that around 66% of all start-ups have teams of two or three people. However, in VC-backed founding teams, only 9.2% of founders are female and three-quarters are white. All male teams represent 82% of all VC-backed start-ups while all female teams represent 6%. Blacks represent 1%, Latinos represent 1.8%, Asians represent 17.7% and Whites represent 77.1% of VC-backed founders<sup>6</sup>.

Based on this same report, geography again plays an important role in these outcomes: around 42% of funded teams are in Silicon Valley, around 20% of funded teams are spread across the U.S., 14% are in NYC, and around 7% are in the Los Angeles area. About 27% of invested capital goes to founders who attended Ivy League universities. In fact, a little more than half of firms in the study had their 25-50% of their portfolios represented by Ivy League founders.

Overall, this research shows that the typical (or most oft-occurring) team is comprised of two White males in Silicon Valley, educated at a U.S. university. In fact, research has demonstrated that 40% of all venture investors attended either Stanford or Harvard<sup>7</sup>.

Expanding on this work, research undertaken by The Information shows that VCs invest in teams who have the same gender as well as the same educational and location background as themselves<sup>8</sup>. This study also provides information about the lack of representation of women, minorities and minority women in VC investment firms. In the survey<sup>9</sup> of 110 women in VC firms, there was only one Hispanic woman partner, one Native American partner and no Black women partners. The remainder of women were White (71 individuals) and Asian (37 individuals).

Additional research by The Information focusing on race/ethnicity found that only 1% of the surveyed 713 VC firms had Black decision-makers (total of 7 individuals) while 1.5% had Hispanic decision-makers (total of 11 individuals). Asians represented 24% of decision-makers (total of 170 individuals) while 73.4% of all decision-makers were White. The research found, that overall, 85% of decision-makers in the U.S. VC industry are male and 73% are White<sup>10</sup>.

digitalundivided, a tech accelerator focused on Black women and Latina entrepreneurs, carried out a survey titled #ProjectDiane to understand the intersections of gender and race on funding and tech entrepreneurs' experiences<sup>11</sup>. Their research demonstrates that while Black women are the fastest growing segment of entrepreneurs in the U.S., the average Black woman tech founder raised \$36,000 while the average amount raised by a

<sup>5</sup> <https://www.graphicsprings.com/founders-funding-and-exit-ranking-usa>

<sup>6</sup> Ibid.

<sup>7</sup> <https://blog.usejournal.com/where-did-you-go-to-school-bde54d846188>

<sup>8</sup> <https://www.theinformation.com/articles/silicon-valleys-most-and-least-diverse-venture-capital-firms?>

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> <https://www.digitalundivided.com/project-diane-2016-report>



failed (mostly) White, male led start-up was \$1.3 million. Of the 88 women of color in the research study, 92% had an undergraduate degree, 60% were alumni of Top 20 ranked schools and 67% of founders who raised more than \$1 million in funding were Ivy League graduates<sup>12</sup>. In general, funding for Black women owned start-ups comes from angel investors, accelerator programs and smaller sized venture firms (less than \$10 million under management). In fact, less than 1% of Black women receive VC funding<sup>13</sup>. Thus, Black women owned start-ups in the tech sector remain undercapitalized.

Despite these challenges, about 40% of all current businesses in the U.S. are women owned. In fact, women owned businesses in the U.S. grew 58% between 2007 and 2018 while all other businesses grew by 12% while women of color owned businesses grew 163% during the same time based on the State of Women Owned Business Report by American Express<sup>14</sup>. Put another way, there were 1,821 net new women-owned businesses added to the economy per day between 2007 and 2018. 1,612 of these were women minority-women owned businesses<sup>15</sup>.

Disaggregating the data further, the American Express report finds that Black women owned businesses grew at the fastest rate of any business during this time: an impressive 172%. Similarly, Latina owned businesses grew by 164% between 2007 and 2018. Despite the growth, revenues generated by women of color owned businesses dropped from \$84,100 in 2007 to \$66,400 in 2018—by contrast, non-minority owned business revenue grew from \$181,000 in 2007 to \$212,300 in 2018<sup>16</sup>. The report notes, “if revenues generated by minority-women owned businesses matched those currently generated by all women-owned businesses, they would add four million new jobs and \$1.4 trillion in revenues to the U.S. economy”<sup>17</sup>.

While in general women and minority owned businesses are less likely to be employer firms, focusing on women-owned businesses with revenues above \$1 million paints a very different picture. These firms represent a small fraction of all firms at 1.7% but compared to all other firms, there has been an increase of 46% in such firms (versus 12% in general for all firms between 2007 and 2018)<sup>18</sup>. Employing a little over 6 million people, these firms represent about 68% of total employment for women-owned firms. Total employment for these firms since 2007 represent a 30% growth compared to a 0.8% decline for all businesses (see figure below)<sup>19</sup>. In 2018, they generated about \$1.2 trillion in revenues and represent 69% of all revenues for women-owned firms.

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<sup>12</sup> Ibid.

<sup>13</sup> <https://www.fastcompany.com/90214465/the-state-of-black-women-getting-funding-in-2018>

<sup>14</sup> [https://about.americanexpress.com/files/doc\\_library/file/2018-state-of-women-owned-businesses-report.pdf](https://about.americanexpress.com/files/doc_library/file/2018-state-of-women-owned-businesses-report.pdf)

<sup>15</sup> Ibid.

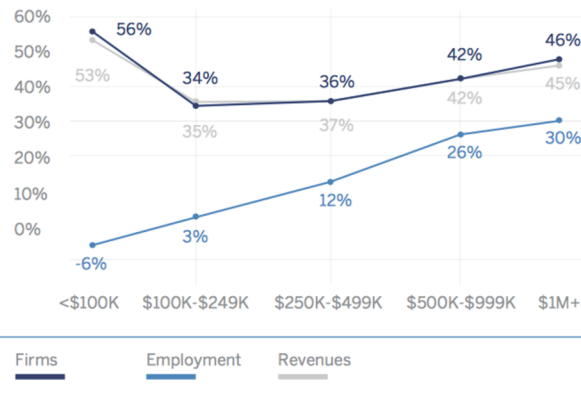
<sup>16</sup> Ibid.

<sup>17</sup> Ibid., page 5

<sup>18</sup> Ibid.

<sup>19</sup> Ibid, page 10

### 2007-2018 GROWTH RATES FOR WOMEN-OWNED BUSINESSES BY SIZE OF BUSINESS



As the American Express report indicates and is seen in the above graphic, growth in employment and revenues for women-owned businesses starts to rise exponentially when revenues reach \$250,000. Thus, supporting women-owned businesses during the \$100,000 to \$249,000 revenue stage and beyond can create positive returns for investments and the economy in terms of employment. Given that currently women-owned businesses account for only 8% of all employment and 4.3% of all revenues, investing and funding women-owned businesses is a smart strategy for economic growth.

#### Solutions

Given the challenges faced by women and minorities as investors and as entrepreneurs in relation to the venture capital industry, a number of solutions are presented below based on emergent trends and research. These solutions focus on making the investment field more diverse and inclusive and creating more equitable access to publicly funded/supported capital programs.

#### *Fellowships and partnerships*

Based on research at the Venture Capital Inclusion Lab at Brown University, emergent trends suggest that a small but growing number of VCs recognize the value of diversity and inclusion for their portfolios and returns. Such firms have started on-ramps for women and minorities into decision-making positions through fellowship and apprenticeships programs. This approach focuses on individuals who have several years of work experience and are looking to start a new career in investment. The program allows these individuals

to gain exposure to investors and the industry, build new networks, and learn investment skills.

These efforts are replicated in other parts of the economy by more established firms as they realize the potential of diversity and inclusion for the health and longevity of their businesses. Some examples from the city of Boston include Pacesetters, a program through the city's Chamber of Commerce that matches minority-owned businesses with established businesses. Through the initial matching, minority-owned businesses gain visibility and are able to secure further contracts with other organizations. More recently in Massachusetts, developers for the casino industry exceeded goals for minority, women and veteran contractors<sup>20</sup> through leadership, partnerships, and clear workforce goals on diversity and inclusion. By building accountability and transparency into the project, developers were able to attract more diverse candidates to work sites as they publicized diversity goals and outcomes. Lastly, an initiative at Eastern Bank titled the Business Equity Initiative works with Black and Latino/a owned businesses towards growth. Using a model similar to private equity, the program matches each business with a dedicated advisor, provides dedicated growth tools including growth capital as a way to address the large and growing economic inequalities in the state<sup>21</sup>.

To build diversity and inclusion into existing VC firms, additional trends suggests that non-traditional backgrounds, such as doctoral degrees in life sciences, can bring about technical experience and knowledge (i.e., maternal health, fertility, targeted therapies, etc.) that is invaluable for securing new deal flow and engaging in due diligence<sup>22, 23</sup>. Furthermore, a number of organizations have undertaken events to grow the networks and investment knowledge of women of color<sup>24</sup>. These trends are underscored by the growth of investment firms and funds dedicated solely to women, to minorities or to minority women<sup>25, 26, 27, 28, 29</sup>. Most notably, outspoken investors, such as Arlan Hamilton, the founder of Backstage Capital, have brought visibility to the challenges facing women and minority owned businesses while speaking about their important role for the U.S. economy.

In all, these success stories are based on intentional programs<sup>30</sup> (such as fellowships), strategic partnerships and knowledge sharing, and leadership and have worked to support

<sup>20</sup> <https://www.bostonglobe.com/opinion/2019/06/19/building-diverse-casino-industry/OC8DQalIEQroxZIZDDdCWM/story.html>

<sup>21</sup> <https://www.easternbank.com/BEI>

<sup>22</sup> See <https://www.westorg.org/2019-07-16-venture-capital-panel>

<sup>23</sup> <https://www.forbes.com/sites/matthunckler/2017/06/02/the-key-to-diversity-in-tech-diverse-investors-says-new-york-based-social-impact-vc/#456590087990>

<sup>24</sup> <https://www.womenofcolorandcapital.com>

<sup>25</sup> <https://philanthropynewsdigest.org/news/100-million-fund-for-women-entrepreneurs-of-color-launched>

<sup>26</sup> <https://www.businessinsider.com/female-founded-venture-capital-funds-startups-investments#forerunner-ventures-3>

<sup>27</sup> <https://femalefoundersfund.com>

<sup>28</sup> <https://www.inc.com/kimberly-weissul/fundery-finds-billions-invested-women-entrepreneurs.html>

<sup>29</sup> <https://medium.com/@AndysHVC/the-rise-of-diversity-focused-venture-capital-378d45390662>

<sup>30</sup> Ozkazanc-Pan, B., Knowlton, K., and Clark Muntean, S. Gender Inclusion Activities in Entrepreneurship Ecosystems: The Case of St. Louis, MO and Boston, MA (June 7, 2017). Available at SSRN: <https://ssrn.com/abstract=2982414>

women and minority owned businesses as well as increase their numbers in the VC industry.

While these trends towards diversity and inclusion in the VC industry are notable and important, they are not necessarily widespread or at scale. The changing demographic make-up of the U.S.<sup>31</sup> will mean new consumers<sup>32</sup>. Coupled with the growth of women and minority owned businesses, these trends require new approaches to creating an economy that works for everyone.

The SBIC program provides important funding for creating new jobs and opportunities in the U.S.. Expanding access to capital provided through this program particularly for women and minority owned firms can create these much needed new jobs and opportunities, particularly given the growing role of global competition. Research suggests that if minority owned businesses were at entrepreneurial parity (parity defined as reaching proportionality between adult minority population and business measures), the U.S. would gain 1.9 million more firms, 13.2 million more employees, and an additional \$2.9 trillion in gross receipts<sup>33</sup>. Similarly, gender parity achieved through capital investments can add around \$4.3 trillion in annual GDP to the U.S. economy by 2025<sup>34</sup>. In all, investments into diversity and inclusion yield tremendous benefits for businesses and the U.S. economy.

Thank you again for the opportunity to share these points. I'm happy to answer any questions and address comments.

Regards,

*Banu Ozkazanc-Pan*

Banu Ozkazanc-Pan, Ph.D.

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<sup>31</sup> <https://www.brookings.edu/blog/the-avenue/2018/06/21/us-white-population-declines-and-generation-z-plus-is-minority-white-census-shows/>

<sup>32</sup> <https://www.fastcompany.com/40422830/why-the-tech-industry-is-hurting-itself-by-not-funding-black-women-founders>

<sup>33</sup> [https://www.mbda.gov/sites/mbda.gov/files/migrated/files-attachments/2012SBO\\_MBEFactSheet020216.pdf](https://www.mbda.gov/sites/mbda.gov/files/migrated/files-attachments/2012SBO_MBEFactSheet020216.pdf)

<sup>34</sup> <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Employment%20and%20Growth/The%20power%20of%20parity%20Advancing%20womens%20equality%20in%20the%20United%20States/MGI-Power-of-Parity-in-US-Full-report-April-2016.ashx>

Chairman RUBIO. Thank you.

Let me start here. Mr. Palmer, you have been the president of the association that represents the SBIC companies for many years now, right?

Mr. PALMER. Eleven years, yes.

Chairman RUBIO. So before this hearing, we tried to get fund managers to come testify. We could not get a single person to come and tell us about their experience. Why will not—Senator Hawley touched on it pretty extensively. Why are they not here today? Why will they not come?

Mr. PALMER. Well, there are some that had legitimate business conflicts, but there is legitimate fear. The Associate Administrator is well known to the industry. His style is one that certainly leaves significant open questions. The fund managers believe they have a fiduciary duty to their investors and they are afraid of retaliation where there are so many steps in the process that are judgment calls that if they go against you, you have got a big problem. And they feel that they cannot, in good faith to their investors, speak publicly lest they put their investors at risk.

Chairman RUBIO. The bottom line is that there are members of your organization, these investment companies, who feel that if they come testify before the elected representatives of the U.S. Senate about the status of the program and how it is working, that they are going to get hurt, that there will be decisions made on the margins that is going to harm them and ultimately put in danger their obligation to their investors. They are afraid to come—

Mr. PALMER. Yes.

Chairman RUBIO [continuing]. Because they are afraid they are going to be retaliated against.

Mr. PALMER. Yes, and though it is difficult to quantify those judgment decisions, there have been events that have happened in the past that they look at, and on the face of it, say that to me looks like retaliation for not hiring him or speaking out against him previously and we just do not feel that we have—they will do it privately. And it is a challenge because there is—being in the sunshine is important. But they have an obligation and they are legitimately scared. I tried to talk to them.

Chairman RUBIO. And I raise this without him being here and able to respond because he was asked the question directly earlier.

Mr. PALMER. Right.

Chairman RUBIO. So we have now on the record his response to that question and we have your statement here, so that Senator Hawley's comments do not just stand on their own but we now have a representative of the association.

Dr. Pan, there is, as you know, the requirement—the SBA essentially requires that an SBIC applicant have two fund managers. They have to both have previous experience and expertise with the program.

I have drafted a proposal that would allow applicants to have a single fund manager with the experience and provide SBA training to applicants whose management team has no previous experience with the program.

My question is do you believe this provision could help expand the pool of potential fund managers? And would this kind of pro-

posal help to increase diversity in the venture capital and private equity communities?

Ms. ÖZKAZANÇ-PAN. Thank you for your question, Mr. Rubio.

I do believe these are good first steps to ensure that there is opportunities available for women and minority fund managers, and sometimes experience and exposure could be one way in which they feel left out. So I think a program like this, with additional elements, could be very beneficial to diversifying SBIC fund managers.

Mr. PALMER. I can give you a case of that that is exactly true. The past chairwoman of my board, Carolyn Galiette with Ironwood Capital, she will tell you point blank that she would never have gotten licensed today—even though she is on her third or fourth license—if they had the standards now in place for licensure that she had back then. And her fund invests, by design, more than half of her investments are in women, minorities and low-income areas as a top tier firm.

Chairman RUBIO. Mr. Muro, I wanted to sort of lead into the question with the following statement. There is two orthodoxies that have been in place for some time which frankly, I have dealt with and confronted and, in some cases, at some point potentially even supported in some of the decisions.

The two orthodoxies are these: the first is that there is a very limited role for government to play writ large across everything. And I am a person who believes in limited government. But that the bottom line is the private market will determine what is a good idea or not a good idea, particularly in the role of investment.

And the second orthodoxy is that we are headed into an era that is good for us, in which we would innovate here but then make things somewhere else. And then we would be on the high end and let someone else make it. We will innovate the software, we will innovate the ideas, and then someone else will build it and that is better for the U.S. consumer.

These are the two orthodoxies.

The problem with the first one, that first one, is that investment today, it is my view but I think it is supported and the report we put out earlier this highlights this, the financialization of so much of our corporate and business activity in this country has driven investment decisions toward how can I get the highest return for the lowest risk in the shortest amount of time? That is what is being rewarded and that is what is driving investment decisions.

So that is the first problem with simply saying the private market will take care of it, is that when you do that, when your focus is on how can I get the highest return in the shortest amount of time with the lowest amount of risk, you are not going to invest in research and development. You are not going to invest in innovation. It may be the greatest idea in history or it may be a total flop.

And that is problematic because of the second point. And that is this notion that we are going to invent things here but they are going to be made somewhere else will not last forever. So there is a lot of noise out there about Huawei. What people are missing about Huawei and telecommunications is an important piece but it is just one piece of a much broader strategy in which China, as an

example, has used the government support of its national champion companies to establish dominance in a series of critical fields to the 21st century.

So how it works is you are one of these companies. You have government-backed credit. You have a guaranteed protection in the domestic marketplace. So here is a billion people that only you can sell to. Plus, we are going to give you money.

So what do these companies do? They can now go abroad in rail cars. They can flood the market with batteries or robotics. And no one can compete with them until none of their competitors exist and they have created a dominance in that industry.

And so I wanted you to address—the first point, I think, is well established and you can talk about it. But it is the second one that I want people to understand, that what is flowing away from us in the 21st century will eventually be the innovation, as well. But there is a value, an inherent value, in the jobs that are created as a national priority in those industries that we are going to have to have a response to.

We are going to have to have a collective national response—that does not have to be partisan, by the way—on China's industrial policy. Because we are not competing with businesses like ours. We are competing with national champions backed by the government of the soon to be largest economy, not per capita but gross largest economy in the world with extraordinary market resources that are going to, in essence, leave us in a world where their companies will dominate all of these fields at the same time as the financialization of our corporate and investment decisions is leading us further and further away from the kinds of things we need to do to compete against them.

So I told you it was a long question.

Mr. MURO. Yes, I think you are pointing to some of the most critical issue we are facing. We know there are market failures on market irregularities and how resources flow at home. What has happened, I think, is that we are realizing that by allowing, by failing to support some of these sectors, they are flowing offshore on their production end and it is no longer simply a choice between innovation and production.

More and more, we are learning that innovation requires specific inputs and detailed iterative knowhow. And even the accumulation of knowledge in specific regions that become warehouses of knowledge. So we have to manage and protect those because you can lose—there are many examples, solar PV cells, electric motors, rare earth elements, LEDs, many others, where we thought we were just off-shoring the production and pretty soon it turned out that we were losing control and leadership in the creativity.

And it is because innovation is not a high-flown purely intellectual activity. It is about small, embedded iterative product iterations and process improvements. We have to be able to manufacture so that we can innovate.

And I think that logic has gotten somewhat skewed. I think the innovation has gotten associated simply with digital innovation and we have lost track of how things actually are created in plants.

Chairman RUBIO. And I will turn it over to the Ranking Member, other than to say that even in the digital space that is true. So the

platform known as the internet and all of the transactions that take place in it has spawned a bunch of innovation. One of them is mobile payment, right? Today, China has—you could argue that we innovated the platform upon which it is occurring. But the innovation and the application of it, when it comes to mobile payment, they lead the world both in adopting it but also in all of the technologies that are related to it.

So at some point in the future, when all of these other companies around the world want to go on a mobile payment system because that is what everyone is doing, they will control—even in the digital space—that industry and the technologies that drive it. The 5G is another example.

The Ranking Member.

Senator CARDIN. Let me thank all of our witnesses.

This has been certainly an interesting hearing, a little bit livelier than most of our hearings. But the focus is on the reauthorization of Congress of the SBIC programs. As I said in the beginning, this is our seventh hearing on reauthorization of parts of the SBA.

So I just really would like to get your views, I hope we could get some short answers. But the SBIC program, you all believe is an important tool available for small businesses?

Mr. PALMER. Yes.

Senator CARDIN. And it appears, from the way that you have presented your testimony in response to the Chairman's question, that it is not doing everything it should be doing today. Is that a fair enough statement?

Mr. PALMER. Not as much as it could be doing. I mean, people are trying. It is just a question of there are barriers to being as successful as it could be.

Senator CARDIN. Are those barriers statutory or is it the way it is being administered?

Mr. PALMER. There are several. There is clearly a mismanagement problem and a hostility in the functioning of the program. I do not say that lightly and I do not say that without evidence. I have got a book in front of me where you can document that.

But I think there is also, for the risk aversion of the program, as far as the ability to make sure that it has zero subsidy, also really minimizes risk. And so as you minimize risk, it takes it away from some of the earlier stage side. And I think it is time to really look more aggressively, what can we be doing to make that valley of death smaller, to allow for more equity, more patient capital, more manufacturing, some earlier stage businesses that are not quite as good.

There are a number of things we need to be looking at to figure out some new tools to make sure we can do that.

Senator CARDIN. So was the early stage capital sabotaged to not work? Because it seems to me early stage capital would deal with some of the issues that we have all been talking about, and it was started and stopped.

Mr. PALMER. Well, there is several different versions of early stage that they have done. There was an Early Stage program that was done around 2012 or thereabouts that actually worked. They only licensed five funds.



The biggest problem they had with it is that you could only get licensed once a year. So you were in, and if they had a question you were out. And so you had to go back and forth a little bit. You have to wait another year. And private sector will not wait a year to raise a fund.

So that could be popped up tomorrow with the regulations reactivated and all they have to do is go to a rolling licensure. That would work and that operates at zero taxpayer subsidy.

The participating securities program was a program that ran from 1994 to 2004, that was extraordinarily good at creating early stage capital investment, it was \$21 billion. But it also lost about \$1 billion or \$1.5 billion because of the cockamamie payback structure.

The SBA has internal models of what they could have done to fix that and that really could have been fixed and reformed with some very modest changes. That could work again, but you would have to make those changes because if you do not protect the taxpayer you have a problem.

But that was why that changed.

Senator CARDIN. And it could have been changed——

Mr. PALMER. It absolutely could have.

Senator CARDIN [continuing]. By the SBA?

Mr. PALMER. That could have been changed—this is going back to the mid-2000s, before my time so I was there post. But I believe some of that could have been done by the administration, which I was in, full disclosure. But some of it would have required some congressional changes, if I recall.

Senator CARDIN. So it appears like, what I have heard from today's hearing, it is not so much the fundamental law that has been passed by Congress, but the way the law is being implemented?

Mr. PALMER. Yes.

Senator CARDIN. It is not reaching its full potential. It is working but it is not working as well as it could work.

Mr. PALMER. Right. And I think one of the things—you heard a lot about risk from the first witness. What you never heard was reward. Reward is a critical element to risk. We have to take risk. We are trying to facilitate risk. We are trying to facilitate the private sector to take risks that they might not otherwise have taken that are not irrational risks but that are properly incentivized without subsidy.

And we have to be not paralyzed by risk but actually figure out how to do that.

Senator CARDIN. No question, small businesses always present a risk. We know that.

Mr. PALMER. Right.

Senator CARDIN. So we recognize if you do not take risks, you are not going to make progress.

The Chairman mentioned, I thought, a very good point on minority participation—professor, I want to get you engaged in this—about the fund managers and the experience of the fund managers, and that can be used to as a way to prevent outreach in underserved communities if you set up such high standards that communities do not have representation in the funds themselves, in the investors themselves.

Are there other recommendations that you would make so that we can get more participation from women, from minorities in underserved communities?

Ms. ÖZKAZANÇ-PAN. Absolutely. And I would be happy to work with respective staffs for solutions, given some of my research and some of the findings around best practices.

One of the things we have seen work are fellowships or apprenticeships that are funded. Sometimes they are matched, sometimes they are fully funded. But this allows women and minorities who may not have the financial background to enter into the fund manager position, to gain that experience and exposure.

There is a venture fellows program at a new venture capital firm that has placed their first fellow into another VC firm. So there are examples across the board of firms doing things right.

And lastly, just as a followup, at the VC Inclusion Lab, we are actually following up with each of the 40-plus firms that signed the National Venture Capital Association diversity pledge in 2014, to see what they have done and what changes they have seen. So I would be able to give you more concrete information hopefully in a few months when we have contacted and gotten information from each of those firms.

Senator CARDIN. As I encouraged from the last witness, please give us your suggestions because you see there is a lot of frustration here and we really do want this program to be at its full—meet its full potential. And it is not doing that today.

So one of the areas is what you are talking about on participation from groups that we just do not have the numbers. These numbers are pathetic. They are not even in the ballpark of where they need to be.

So we have taken looks at other areas of SBA programs that have not reached, we think, full potential and we have taken steps to correct that.

So your recommendations there, I think, can help us in trying to meet those goals.

Mr. PALMER. And one thing I would add to that is, you know, it is a particular risk to step out and try to raise a private equity fund. You have no salary, you take a year to two years. And it is a particularly risk for women and minorities to take that risk. It is a bigger leap.

And so if you are trying to get more diverse fund managers in the SBIC program—which we certainly want to do, and I actually have some ideas in my testimony that I do think help move the needle there—just look at the new funds. You heard from the first witness that we have so many new funds coming in. Total new pipeline is down 45 percent year over year. It is not new funds coming in. They are being actively scared off.

And if you cannot keep the funds that you have because they think they are being mistreated and paralyzed, then how are you supposed to get people to take that entrepreneurial risk to form a new fund that is a woman or a minority? It is really hard.

Senator CARDIN. It is just hard to understand why we have not done better in creating new funds in minority and women communities. It is a logical step for the SBIC program to have achieved and it does require an attitude of SBA to do this.

Mr. PALMER. I have had 10 chairs of the board over my terms. Four have been women. So that is not 50 percent, but that is good. We actually have a lot of women in leadership. Actually, our northeast president next year is going to be a woman from your state.

We have a lot—we have tried a lot of women and we are making progress there. It does take time. And I do think, part of the problem to get an SBIC fund is you have to come from private equity. So you are recycling from the same pool. We are far more diverse than the rest of the private equity and venture industry but you are not going to really have a breakout until you can broaden that pool out a little bit.

And so actually, I have some proposals in here about how to do that that I think work and could happen very quickly, that we could see the next generation of minority and women fund managers in a way that is constructive and without subsidy.

So there is a lot we can do there but the program really is being—has major management problems right now. They do not have staff in senior positions. You are missing more than one senior staffer. You are missing the top career staffer, the Deputy Associate Administrator. You are missing the Director of Licensing and Program Development. They have three what are called area chiefs, that are in charge of managing the teams that manage the funds day-to-day. There are three of those. Two of them are vacant.

You have a lot of—and some of these are positions that have been open for over two years. And the Program Development Office, whose job it is to recruit new funds and to help license funds in underserved states and underserved communities, consistent with Senator Rubio's bill, has gone from four FTEs to one. There is only a director left with zero employees, and I do not think he has got a budget since last December.

So I am not sure the private sector is seeing the program being managed in the same way that the person running the program is seeing it. We see it from a very different lens that is very concerning. And I think the numbers and data back this up.

The private sector is not saying okay, we do not want to do SBICs or small business investment because there is an opportunity. But we are looking at that and going oh my gosh, are you kidding me? Am I going to walk into that buzz saw? Am I going to put my investors and my professional career on that line? And that is a problem.

Senator CARDIN. Look, I think Senator Kennedy's point about we look at action rather than words, it was disappointing that we did not have an acknowledgment as to numbers being unacceptable.

I thank you, Mr. Chairman.

Chairman RUBIO. Before turning to Senator Duckworth, just one observation on your point. It is hard to attract new people when one of the requirements is that you cannot be new.

Mr. PALMER. Mm-hmm.

Chairman RUBIO. In essence, what we are saying, you have to have two fund managers with previous experience in order to be an applicant, you are basically saying the only people that can apply are the people that have done it before. Well that, by definition, knocks out everybody who is new and wants to come in.

Mr. PALMER. That is right. You have to basically have been recruited somewhere else in the private equity industry and then you can spin out to form an SBIC. And that is why one of my proposals is you can form bank-owned non-levered SBIC funds. That is a big mouthful. But banks can do that and they have done that. They exist across the country.

And banks have something that SBICs do not have, which is scale. Some SBICs are as few as two people. Banks have really good recruiting programs. They have gotten good at that in the past couple of years. And so if they form bank-owned non-levered—one, they can help fill the equity gap, that is long-term patient capital. Two, they can broaden the footprint. And three, they can seed the next generation of private equity fund managers. That would be helpful.

That is not the only solution. This has got to be a multi-step process. But there are a number of things that we can do.

Chairman RUBIO. That may be a great idea, but it is not going to work unless you find a shorter term, a shorter word to describe it.

[Laughter.]

Mr. PALMER. Yes, sorry, wonking out.

Chairman RUBIO. We have got to come up with something fancy. Senator Duckworth.

Senator DUCKWORTH. Thank you, Mr. Chairman.

Actually, Mr. Palmer, I am glad you brought up banks because I think another component of the challenges that we are facing with SBIC, especially for providing long-term loans to growing small businesses is that smaller banks find it very difficult to invest in SBICs.

Mr. PALMER. Mm-hmm.

Senator DUCKWORTH. And when you talk about women and minority communities, you know, that is the realm of the smaller banks, right?

Mr. PALMER. Mm-hmm.

Senator DUCKWORTH. They are the ones that tend to be, you know, you have black-owned banks, women-owned banks. Those tend to be smaller. And I think that they are at a disadvantage to larger banks who have greater access to this program.

This week Senator Young and I introduced the Investing in Main Street Act that would allow financial institutions to invest a greater portion of their surplus and capital into SBICs.

Could you describe how this legislation or this idea might help small businesses better access capital without jeopardizing the safety and soundness of these financial institutions?

Mr. PALMER. Sure, absolutely. I think it is a great idea. This is a provision that has already passed the House unanimously. It has broad bipartisan support and I appreciate your taking it up.

Basically, there is a timing issue, when banking law was written at a different time than the Small Business Investment Act. And so banks are allowed to invest more in small businesses via SBICs but the SBICs are not allowed to accept the money from the banks to invest in small businesses from the banks.

It is an accident of history. And this bill would fix that. And what that would do is get more capital flowing into SBICs. And one

of the things that banks do, is banks have this big footprint, to your point. And they have more interactions. And a lot of times a small business will go to a bank and say I need a loan. Well, that is not the type of stuff we do. You need equity. You need unitranche. You need some complicated structure, subordinated debt. You are not cash-flowing enough, whatever it may be.

But they can turn around and hand that and say hey look, SBIC, here is a great opportunity. We know this client. They are in an underserved area. That is important to us from a bank, from a CRA perspective. Can you take a look and see if this works. And often they do.

There are between 500 and 600 banks that are currently invested in Small Business Investment Companies. They get very good returns. But they also get community reinvestment assessment saying hey, is this serving these underserved communities? Because many times they are.

So yes, I think it would be very helpful. I think it does not reduce any bank protections. It would still require the approval of the bank regulators to rise above that. But it would increase small business access to capital and broaden the footprint of small businesses that are exposed to it.

Senator DUCKWORTH. Thank you so much.

Professor Özkazanç-Pan, you mentioned in your testimony women and minority-led VC firms have increased over time but a lot of work remains to be done. In 2016, SBA joined several organizations to launch the ONBOARD Initiative, designed to give SBICs more options to hire diverse talent and assume board leadership positions.

Unfortunately, it appears that SBA has done little to promote the initiative since its creation, I think missing a real opportunity to help SBICs hire qualified, diverse candidates for their management teams.

Can you discuss why initiatives like this are so important to the investment community and what Congress and the SBA can do to improve diversity on VC management firms?

Ms. ÖZKAZANÇ-PAN. Yes, absolutely. I think these kinds of initiatives are profoundly important because they signal one, interest and opportunity for women and minorities that they may not otherwise see themselves in taking on these roles. But they also communicate information and opportunities both in terms of signaling to people that these are things available to them that is not generally something that they see them for themselves.

I would say that if we continue with the program that is not discontinued, that would be a step in the right direction.

In terms of VC firms, the reason we are seeing the emergence of women or minority or minority women-only focused firms is because the VC, as a whole, is not moving fast enough. So these are actually smaller firms that are trying to fill in the gaps.

And I believe that there could be potentially dedicated funds that might also work in a similar fashion at the SBIC or the SBA level.

Senator DUCKWORTH. Thank you.

Did you want to add something, Mr. Muro?

Mr. MURO. My overarching point is simply that all of these are much more the technical questions. They really are about overall

American well-being and competitiveness, you know. So to make sure that we are unveiling every great entrepreneurial opportunity, you know we are missing Einsteins and missing entrepreneurs.

So it is important that the systems works if we are going to push back against the challenge from China and elsewhere.

Senator DUCKWORTH. Thank you.

Mr. PALMER. And licensing more women fund managers and keeping the fund managers you have that are women. There are a number of women that run funds right now that are pulling their hair out and deciding whether or not they want to do this. And so keeping them in, and getting more women fund managers, I think is very helpful.

The Library of Congress studied this and they found basically that like is more likely to invest in like. Women are more likely to invest in other women and women-owned businesses. And the same thing is true for minority. When you have minorities on your private equity team, you tend to invest more in minority-run businesses.

And so we just need to add more people into the program.

Senator DUCKWORTH. You spoke, Mr. Palmer, about these empty positions. The other thing that I am concerned about is the fact that there is no timeframe on application status updates and approvals or disapprovals as people are moving applications through the approval process.

Senator Risch and I, along with several members of this Committee, introduced the Small Business Investment Improvement Act of 2019 that would actually set the timeframes in which SBA must give status updates to SBIC applicants and set deadlines.

Can you speak a little bit about the importance of that portion of it, in terms of the need for timeframes and deadlines?

Mr. PALMER. Sure. The way the SBICs work, they have to raise private capital. If you cannot pass a private filter, you have no business going and getting a license. So you have to be responsive to those private investors. You have to be able to manage their expectations. I think I can get a license in X period of time. And this is a multi-step process with lots of stages.

And every step of every licensing process, since the new management of the Office of Investment has taken over, has become gummed up and unpredictable. It is regulatory roulette.

And so we just do not know whether it is going to take—it used to take two weeks. Now it takes 13 months, in some cases, to get a green light letter for a repeat fund with a clean examinations. That is nuts.

Meanwhile, your investors, who are waiting on this money, the pensions, the universities, the endowments who want to deploy this capital to small business, they need to get a return. They cannot be sitting on millions of dollars doing nothing while you wait around for the SBA to get to license you. Managing expectations is critical.

So having a process where it is clear, it is consistent, it is fair—if it is no, give me a quick no. But be fair about it. And dragging these things out where it is step after step after step, it makes no sense.

You heard the first witness talk about examinations, he has done such a good job. SBIC funds have zero control over the examinations. The SBA does those. The SBA controls the time. They control the results. It takes months to get them scheduled. It takes a month for them to do it. And it might take 6 months or longer to get the results back.

And during that time period, you cannot advance the licensing period. You cannot reserve leverage. You cannot do a lot of your basic stuff you need to do unless your window happens to come up at the same time their exam clock is going, of which you have no control.

So bragging about having a tightened credit standard for examinations, where now 69 percent of the SBIC funds meet my credit standard, they are compliant. Well, that means that the SBA is failing 30-plus percent of the SBICs being able to operate fully. And that does not work for licensing, it does not work for any of it.

And so having timelines and holding the accountable, I think, is critical because this is the type of mundane stuff, administrative stuff, that is paralyzing and is completely unnecessary.

Senator DUCKWORTH. Thank you.

Mr. PALMER. It is baffling. So it would be very helpful and we welcome it. Thank you.

Senator DUCKWORTH. And it is a bipartisan bill.

Thank you. I yield back.

Chairman RUBIO. Thank you.

I want to thank you all for being here. We were delayed with the votes and so forth, but just to kind of sum it up, if you look at the need for innovation, innovation, by definition, is risky because it has never been done before. That is why it is innovative.

And to do that takes money, right. And so people with money or entities with money are doing less of it than ever before. The banks do not want to lend. They are kind of frozen in some way. They are just not in the business of doing that anymore.

And private equity has moved further and further away from that. They want to do less risky. They want a higher yield at a shorter or mid-term period of time and there is no taste for that. So that is why programs like this exist in the small business space.

In the big space, you are a multi-billionaire, you want to invest in a rocket company, you can do that and they have done it. But if you are a small business person with a great idea, you need access to capital. The banks will not give it to you. The venture capital community does not like ideas like that. It is too risky. And so that is where this program comes into play.

So it is concerning when we see the numbers flatline and begin to decline at a time of great need. And I do not think we have run out of ideas in this country, or people with them.

And it is most concerning when you start to hear that we are going to be applying new criteria to the program and the buzz words I am hearing are by the way, it is the same criteria of the funds and the banks that are not lending money now. So in essence, we are going to turn the SBIC program into a similar criteria to the ones that created the need for it in the first place.

And all of it happening, by the way, at a time which our Nation desperately needs innovation. We need to come up with a response to Chinese industrial policy that threatens to displace us in industry after industry after industry around the world. Very aggressive and we have not had an answer for it. And clearly, the current market conditions are not meeting that demand.

So other than that, I think it is going well.

[Laughter.]

Chairman RUBIO. No, it was a very insightful hearing and that is why I am so glad we are doing reauthorization because we are not just having people come in and talk to us. We are going through the lines and the details at a granular level of the entire agency and the programs that it has and trying to align them to national priorities in a way that I hope can actually avoid some of the partisan fights that are going on.

This is stuff that should be unifying and I think can and has a chance to be.

So we are grateful to all of you for your patience and the time you have given us today.

The hearing record for this hearing is going to remain open for two weeks. If there is any statements or questions for the record, they should be submitted by Wednesday, July 10th, at 5 p.m.

And with that, the hearing is adjourned.

[Whereupon, at 5:04 p.m., the Committee was adjourned.]

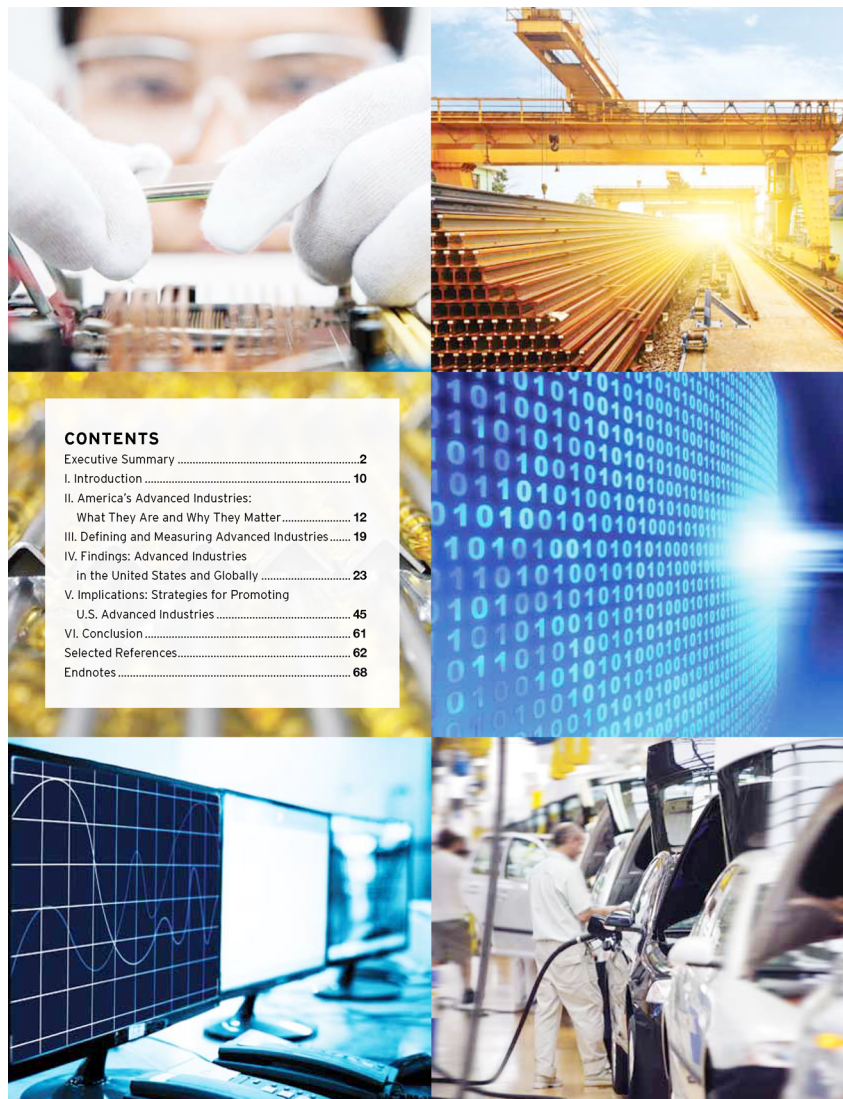


## **APPENDIX MATERIAL SUBMITTED**



# AMERICA'S ADVANCED INDUSTRIES

WHAT THEY ARE, WHERE THEY ARE,  
AND WHY THEY MATTER



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# AMERICA'S ADVANCED INDUSTRIES

WHAT THEY ARE, WHERE THEY ARE,  
AND WHY THEY MATTER

MARK MURO, JONATHAN ROTHWELL, SCOTT ANDES, KENAN FIKRI, and SIDDHARTH KULKARNI

February 2015



## EXECUTIVE SUMMARY

**T**he need for economic renewal in the United States remains urgent. Years of disappointing job growth and stagnant incomes for the majority of workers have left the nation shaken and frustrated. At the same time, astonishing new technologies—ranging from advanced robotics and “3-D printing” to the “digitization of everything”—are provoking genuine excitement even as they make it hard to see where things are going.

### ABOUT THE ANALYSIS

Individual advanced industries were identified using two criteria:

- An industry's R&D spending per worker must fall in the 80th percentile of industries or higher, exceeding \$450 per worker
- The share of workers in an industry whose occupations require a high degree of STEM knowledge must also be above the national average, or 21 percent of all workers

An industry must meet both criteria to be considered advanced. Together the two thresholds identify 50 industries that invest heavily in technology innovation and employ skilled technical workers to develop, diffuse, and apply new productivity-enhancing technologies.

Hence this paper: At a critical moment, this report asserts the special importance to America's future of what the paper calls America's “advanced industries” sector.

Characterized by its deep involvement with technology research and development (R&D) and STEM (science, technology, engineering, and math) workers, the sector encompasses 50 industries ranging from manufacturing industries such as automaking and aerospace to energy industries such as oil and gas extraction to high-tech services such as computer software and computer system design, including for health applications.

These industries encompass the nation's “tech” sector at its broadest and most consequential. Their dynamism is going to be a central component of any future revitalized U.S. economy. As such, these industries encompass the country's best shot at supporting innovative, inclusive, and sustainable growth. For that reason, this report provides a wide-angle overview of the advanced industry sector that reviews its role in American prosperity, assesses key trends, and maps its metropolitan and global competitive standing before outlining high-level strategies to enhance that.

The overview finds that:

## Advanced industries represent a sizable economic anchor for the U.S. economy and have led the post-recession employment recovery

Modest in size, the sector packs a massive economic punch:

- AS AN EMPLOYER AND SOURCE OF ECONOMIC ACTIVITY THE ADVANCED INDUSTRY SECTOR PLAYS A MAJOR ROLE IN THE U.S. ECONOMY.** As of 2013, the nation's 50 advanced industries (see nearby box for selection criteria) employed 12.3 million U.S. workers. That amounts to about 9 percent of total U.S. employment. And yet, even with this modest employment base, U.S. advanced industries produce \$2.7 trillion in value added annually—17 percent of all U.S. gross domestic product (GDP). That is more than any other sector, including healthcare, finance, or real estate.

At the same time, the sector employs 80 percent of the nation's engineers; performs 90 percent of private-sector R&D; generates approximately 85 percent of all U.S. patents; and accounts for 60 percent of U.S. exports. Advanced industries also support unusually extensive supply chains and other forms of ancillary economic activity. On a per worker basis, advanced industries purchase \$236,000 in goods and services from other businesses annually, compared with \$67,000 in purchasing by other industries. This spending sustains and creates more jobs. In fact, 2.2 jobs are created domestically for every new advanced industry job—0.8 locally and 1.4 outside of the region. This means that in addition to the 12.3 million workers employed by advanced industries, another 27.1 million U.S. workers owe their jobs to economic activity supported by advanced industries. Directly and indirectly, then, the sector supports almost 39 million jobs—nearly one-fourth of all U.S. employment

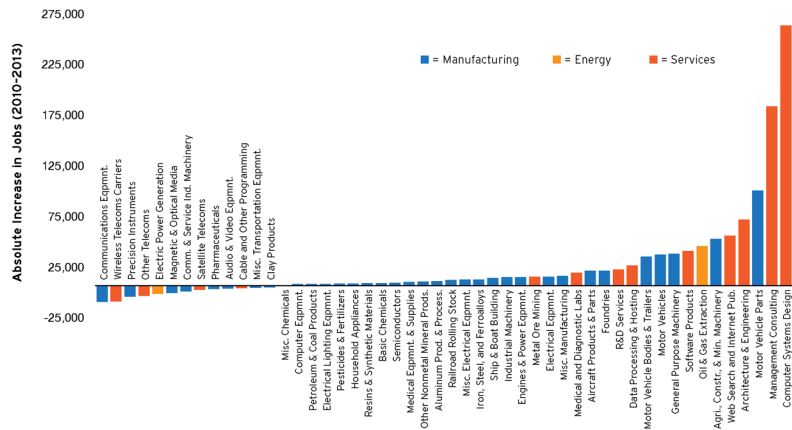
### The 50 Industries That Constitute the Advanced Industries Sector

MANUFACTURING		ENERGY
Aerospace Products and Parts	Motor Vehicles	Electric Power Generation, Trans., and Distribution
Agr., Construction, and Mining Machinery	Navigation, Measurement, and Control Instruments	Metal Ore Mining
Aluminum Production and Processing	Other Chemical Products	Oil and Gas Extraction
Audio and Video Equipment	Other Electrical Equipment and Components	SERVICES
Basic Chemicals	Other General Purpose Machinery	Architecture and Engineering
Clay Products	Other Miscellaneous Manufacturing	Cable and Other Subscription Programming
Commercial and Service Industry Machinery	Other Nonmetallic Mineral Products	Computer Systems Design
Communications Equipment	Other Transportation Equipment	Data Processing and Hosting
Computers and Peripheral Equipment	Pesticides, Fertilizers, and Other Agr. Chemicals	Medical and Diagnostic Laboratories
Electric Lighting Equipment	Petroleum and Coal Products	Mgmt., Scientific, and Technical Consulting
Electrical Equipment	Pharmaceuticals and Medicine	Other Information Services
Engines, Turbines, and Power Trans. Equipment	Railroad Rolling Stock	Other Telecommunications
Foundries	Resins and Synthetic Rubbers, Fibers, and Filaments	Satellite Telecommunications
Household Appliances	Semiconductors and Other Electronic Components	Scientific Research and Development
Industrial Machinery	Ship and Boat Building	Software Publishers
Iron, Steel, and Ferroalloys	Medical Equipment and Supplies	Wireless Telecommunications Carriers
Motor Vehicle Bodies and Trailers	Reproducing Magnetic and Optical Media	
Motor Vehicle Parts		

● **IN TERMS OF THE SECTOR'S GROWTH AND CHANGE, THE TOTAL NUMBER OF JOBS IN THE SECTOR HAS REMAINED MOSTLY FLAT SINCE 1980, BUT ITS OUTPUT HAS SOARED.**

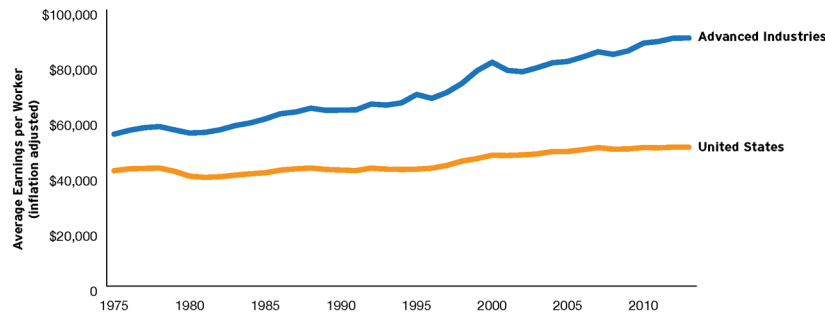
From 1980 to 2013 advanced industry output expanded at a rate of 5.4 percent annually—30 percent faster than the economy as a whole. Since the Great Recession, moreover, both employment and output have risen dramatically. The sector has added nearly one million jobs since 2010, with employment and output growth rates 1.9 and 2.3 times higher, respectively, than in the rest of the economy. Advanced services led this post-recession surge and created 65 percent of the new jobs. Computer systems design alone generated 250,000 new jobs. Certain advanced manufacturing industries—especially those involved in transportation equipment—have also added thousands of jobs after decades of losses

**The advanced industry sector's post-recession employment surge has been broad-based but led by services**



- **ADVANCED INDUSTRIES ALSO PROVIDE HIGH-QUALITY ECONOMIC OPPORTUNITIES FOR WORKERS.** Workers in advanced industries are extraordinarily productive and generate some \$210,000 in annual value added per worker compared with \$101,000, on average, outside advanced industries. Because of this, advanced industries compensate their workers handsomely and, in contrast to the rest of the economy, wages are rising sharply. In 2013, the average advanced industries worker earned \$90,000 in total compensation, nearly twice as much as the average worker outside of the sector. Over time, absolute earnings in advanced industries grew by 63 percent from 1975 to 2013 after adjusting for inflation. This compares with 17 percent gains outside the sector. Even workers with lower levels of education can earn salaries in advanced industries that far exceed their peers in other industries. In this regard, the sector is in fact accessible: More than half of the sector's workers possess less than a bachelor's degree

Since 1975, average earnings in advanced industries have increased almost five times as fast as those in the overall economy



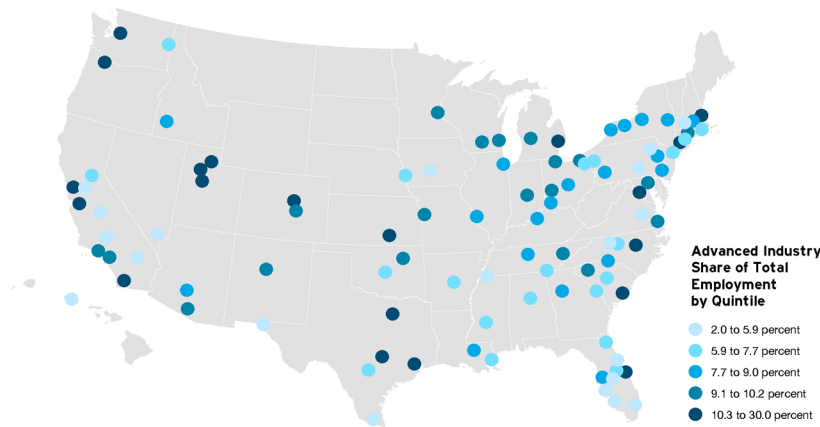
## The advanced industries sector is highly metropolitan and varies considerably in its composition and depth across regions

Advanced industries are present in nearly every U.S. region, but the sector's geography is uneven:

- ADVANCED INDUSTRIES TEND TO CLUSTER IN LARGE METROPOLITAN AREAS.** Looking across the country, the 100 largest metro areas contain 70 percent of all U.S. advanced industries jobs. In terms of the sector's local clustering, **San Jose** is the nation's leading advanced industry hub with 30.0 percent of its workforce employed in the sector. **Seattle** follows with 16.0 percent of its local jobs in advanced industries. **Wichita** (15.5 percent); **Detroit** (14.8 percent), and **San Francisco** (14.0 percent) follow. Overall, advanced industries account for more than one in 10 jobs in nearly one-quarter of the country's major metro areas
- THIS CLUSTERING OCCURS IN A VARIETY OF CONFIGURATIONS.** Some metropolitan areas—such as **Grand Rapids, MI**; **Portland, OR**; and **Wichita**—focus heavily on advanced manufacturing pursuits such as automotive, semiconductor, or aerospace manufacturing, respectively, while metros like **Bakersfield** and **Oklahoma City** exhibit strong energy specializations. By contrast, services such as computer systems design, software, and research and development predominate in metropolitan areas like **Boston**, **San Francisco**, and **Washington**. For their part, **San Jose**, **Detroit**, and **Seattle** exhibit depth and balance across multiple advanced industry categories



### Advanced industries' share of total employment varies significantly across major metropolitan areas



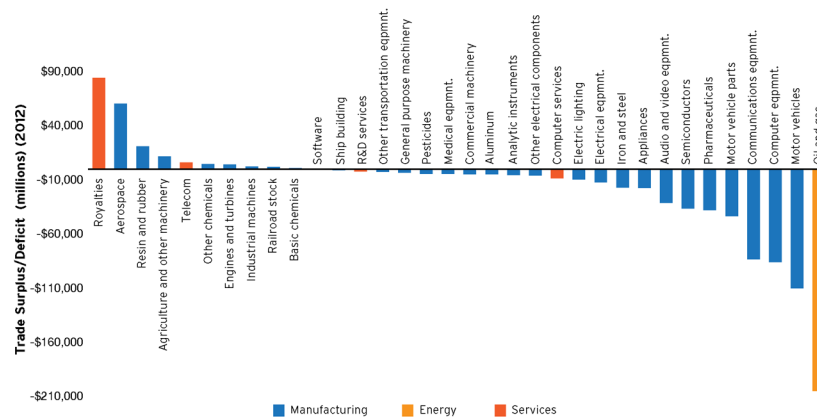
- **OVERALL, THE NUMBER OF EXTREMELY DENSE CONCENTRATIONS OF ADVANCED INDUSTRY ACTIVITY HAS DECLINED.** In 1980, 59 of the country's 100 largest metropolitan areas had at least 10 percent of their workforce in advanced industries. By 2013, only 23 major metro areas contained such sizable concentrations

## The United States is losing ground to other countries on advanced industry competitiveness

The United States has the most productive advanced industries in the world, behind only energy-intensive Norway. However, this competitiveness appears to be eroding:

- **THE NATION'S DECLINING CONCENTRATION IN ADVANCED INDUSTRIES AND ITS NEGATIVE TRADE BALANCE IN THE SECTOR DO NOT BODE WELL.** Since 2000, the sector's employment and output as a share of the total U.S. economy has shrunk, and the nation's standing on these measures now lags world leaders. Equally worrisome is the balance of trade in the sector. Although advanced industries export \$1.1 trillion worth of goods and services each year and account for roughly 60 percent of total U.S. exports, the United States ran a \$632 billion trade deficit in the sector in 2012, in line with similar yearly balances since 1999. To be sure, a handful of individual advanced industries such as royalties and other intellectual property and aerospace manufacturing enjoy trade surpluses that exceeded \$60 and \$80 billion in 2012. However, numerous areas of historical strength such as communications equipment, computer equipment, motor vehicles, and pharmaceuticals now run sizeable deficits, as do high-value R&D services and computer and information services

### With few exceptions, the United States runs a significant trade deficit in advanced industries



- NOTWITHSTANDING THE NATION'S STRONG INNOVATION ENTERPRISE, THE UNITED STATES' ADVANTAGE ON THIS FRONT IS SLIPPING.** For certain the advanced industry sector remains the key site of U.S. technology gains. However, the United States is losing ground relative to other countries on measures of innovation performance and capacity. For example, the U.S. share of global R&D and patenting is falling much faster than its share of global GDP and population, meaning that U.S. slippage cannot simply be attributed to demography or macroeconomic convergence. Likewise, America's research dominance looks less impressive after adjusting for the size of its working age population. Turning to the nation's critical regional innovation ecosystems, surprisingly few U.S. metropolitan areas rank among the world's most innovative—as measured by patent cooperation treaty applications per capita. Among the nation's most patent-intensive regions, just two—**San Diego** and the **San Jose-San Francisco** combined area—rank in the global top 20 and just two more (**Boston** and **Rochester**) score in the top 50
- JOBS IN ADVANCED INDUSTRIES ARE AVAILABLE AT ALL LEVELS OF EDUCATION, BUT ONLY A NARROW EDUCATIONAL AND TRAINING PIPELINE CHANNELS POTENTIAL WORKERS INTO THE SECTOR.** At the same time, the sector faces a labor supply challenge. By definition, an outsized share of advanced industries' workers can be found in STEM occupations. So the sector is a critical storehouse of the nation's STEM knowledge base. However, globalization and technological change are increasing the education requirements of the sector, sharpening its skills challenge. Amid these trends, many advanced industry employers report difficulties finding qualified workers, which places a drag on their competitiveness. For example, a posting for a STEM-related occupation in an advanced industry remains online for an average of 43 days. This compares with 32 days for non-STEM ads. Contributing to those hiring delays is the fact that the U.S. education system graduates too few college students in STEM fields and does too little to adequately prepare children in mathematical and scientific concepts. U.S. youths and adults alike perform much more poorly on international exams of math and science competencies than

many of their peers in developed countries. Moreover, even students in the top 10 percent of U.S. performers score well below their highest-scoring peers in other developed countries

Complicating the sector's human capital challenges are sharp regional variations in the availability of skills. For example, in 15 of the largest 100 U.S. metropolitan areas the number of STEM graduates as a share of the young adult population (aged 20 to 34) exceeds Finland's, which holds the highest share internationally. These skills poles include some of the nation's most successful advanced industry hubs, including **Boston, San Jose, Raleigh, and Provo**. At the other end of the spectrum, however, 33 large U.S. metropolitan areas' STEM graduation rates trail those of Spain, which ranks 24th internationally. These metropolitan areas include prominent such places like **Phoenix, Las Vegas, Miami, Dallas, Detroit, Houston, and Kansas City**. This variation in the availability of human capital places a serious drag on the ability of many metropolitan areas to support advanced industries locally and nationally

## The nation's private and public sectors must engage to defend and expand America's advanced industries

Looking forward, this description and assessment of the advanced industry sector points to significant opportunity—but also challenges.

On the positive side, the combination of intensive technology investment and highly skilled STEM workers in the advanced industry sector represents a potent source of U.S. prosperity—including for workers without a bachelor's degree. Advanced industries power the national economy and their success is a prerequisite for building an opportunity economy in the United States. Moreover, the report makes clear that a distinct advanced industry geography has emerged within which varied combinations of industries cluster in various regions to avail themselves of key innovation resources, skilled workers, and supplier networks. In this respect, America's advanced industries are not national. They are local, and in regions like Austin, Boston, San Diego, Seattle, and Silicon Valley they are world-class hubs of prosperity.

Yet too many U.S. advanced industries and local advanced industries clusters are ceding global leadership.

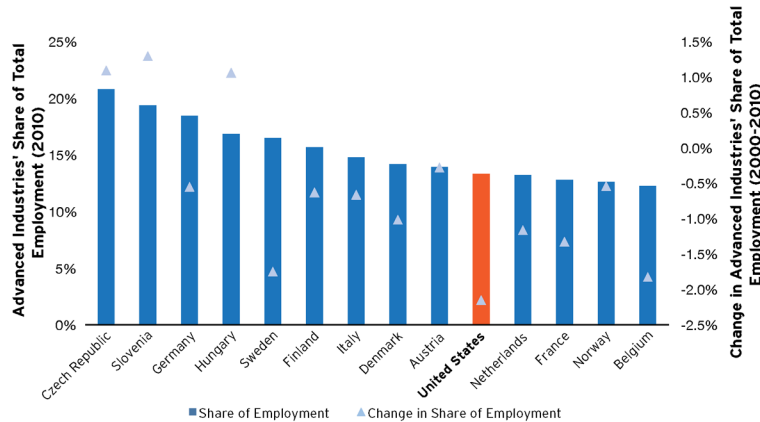
The deterioration of the nation's balance of trade in advanced technology products over the last decade raises especially sobering questions, not just about trade policy, but about the long-term vitality of the sector. Likewise, too few regional advanced industry ecosystems now retain the technology inputs, labor pools, and supplier density to generate the synergies that drive global competitiveness. Making matters worse is the gridlock in Washington that continues to preclude national action to strengthen advanced industries through sensible corporate tax reform or strategic trade liberalization and enforcement.

All of which means private and public sector leaders—particularly those working at the state and regional level—must engage. Already numerous state and regional partnerships are working to expand America's advanced industries, often by attending to the fundamental inputs needed to ensure these industries' long-term growth.

Yet more can and should be done. Among other initiatives, the nation's private- and public-sectors should together:

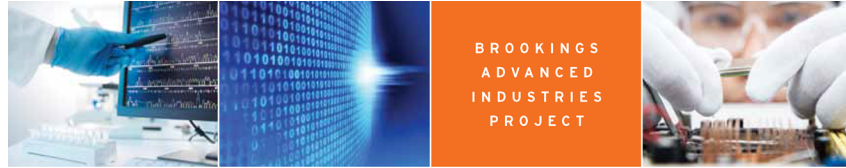
- **COMMIT TO INNOVATION.** Innovation remains the only lasting source of advantage for firms and places in the advanced industry sector, yet its speed and complexity are ratcheting up and demanding new strategies. Accordingly, both the private and public sectors need to radically rethink their technology development strategies. Lead actors in firms and government each need to ramp up the scale of their innovation efforts and reconsider the formats through which they conduct them. More R&D conducted within new, more open or networked innovation models will be necessary in the coming years

### U.S. employment in advanced industries is low by international standards and falling rapidly



- RECHARGE THE SKILLS PIPELINE.** More qualified workers with different and more technical skillsets are also critical to the future competitiveness of the sector. However, the skills prerequisites of modern advanced industries have been changing faster than the country's ability to train the needed workers. Now that the economy is heating up and firms are beginning to expand again, both private- and public-sector actors—often in partnership—need to bear down on improving the availability of skilled workers by developing smart, industry led, sector-specific, regional skills initiatives. Overall, firms need to get much more involved in developing the skills pipeline and the public sector must become much more responsive to their needs
- EMBRACE THE ECOSYSTEM.** Finally, firms, governments, and other relevant actors must work to strengthen the nation's local advanced industry ecosystems—the regional industrial communities within which firms operate. Innovation and skills development do not happen just anywhere. They happen in places, most notably within metropolitan regions, where firms tend to cluster in close geographic proximity, whether to profit from local knowledge flows, access skilled workers, or tap regional supplier networks. Unfortunately, though, in too many places America's advanced industry clusters are thin or eroded after decades of offshoring and disinvestment. It is critical, therefore, that private- and public-sector leaders work together to renew the vitality of the nation's regional advanced industries ecosystems—the most durable foundations of U.S. competitiveness in the sector. Firms should seek to quantify the value they derive from vibrant local ecosystems even as localities and states work to enhance the local environment for advanced industry activity through investments in anchor institutions and support for cluster infrastructure

America's advanced industries are a critical anchor of national prosperity. Business leaders, government, and the civic sector need to work together in new ways to augment their vitality. ■



## I. INTRODUCTION

**T**he need for economic renewal in the United States is urgent. Years of disappointing job growth and stagnant incomes for the majority of workers have left the nation frustrated and pessimistic. Many doubt that the nation's economy can still deliver on its promise of prosperity. At the same time, with "disruption" in the air, astonishing new technologies—ranging from advanced robotics and 3-D printing to the "digitization of everything"—are provoking genuine excitement even as they make it difficult to see where the economy is headed. In short, it has become hard to agree on the elements of a rebuilt American economy that works for all even as great potential remains evident.

Which is where this paper comes in. Amid this climate of uncertainty, this report asserts that one particular swath of highly significant industries will be an important component of any revitalized U.S. economy. That sector is what this paper calls the "advanced industries" sector. First highlighted by McKinsey & Co., advanced industries—characterized by their deep involvement with technological innovation and STEM (science, technology, engineering, and math) workers—create good jobs in dozens of high-value, high-technology fields. These fields range from manufacturing industries such as automaking, aerospace, and medical devices to fast-growing service industries such as computer software, to energy industries such as oil and gas extraction. Through their activities, these industries encompass the nation's "tech" sector at its broadest and most consequential.

What is more, these industries also drive productivity in other portions of the economy. They support long supply chains, and they stimulate local economies through the spending of their workers. Altogether, the sector directly and indirectly supports as much as one-fourth of the nation's jobs.

**“Advanced industries support opportunity in other sectors, and have led the post-recession employment recovery. Their future competitiveness and growth are prerequisites for broadly shared prosperity.”**

In short, the advanced industries sector—defined by its deep investment in R&D and STEM workers—encompasses the nation's highest-value economic activity. As such, these industries are the country's best shot at innovative, inclusive, and sustainable growth.

But there is a problem. The future competitiveness of the U.S. advanced industries sector is uncertain. Competitor nations are accelerating their investments in research and development (R&D), STEM workers, and strong regional technology ecosystems just as the U.S. commitment weakens. As a result, recent decades have seen large-scale losses of manufacturing jobs and a growing trade deficit even in advanced technology products.<sup>1</sup> At the same time, the national government remains locked in partisan paralysis when it should be providing a platform for renewal. Going forward, a new alignment of states, cities, and metropolitan areas—and regional networks of public, private, and civic institutions—is going to be needed to transcend Washington's paralysis and make advanced industry competitiveness a top priority.

And so, at a moment of uncertainty about the sources of U.S. economic renewal, this report urges the nation to double down on the advanced industries sector as one component of future prosperity. The report first explains what the advanced industries are and why they matter. It then explores the size, nature, and geography of the advanced industries sector, with particular attention to its distribution across U.S. metropolitan areas. It describes both the strength of the sector in the United States and a number of challenges that are undercutting its international competitiveness. Finally, the report suggests several priority areas for private- and public-sector work to promote the sector's growth.

Ultimately, the main point is simple: A competitive and growing advanced industries sector is prerequisite any future broadly shared prosperity. The nation should place a high priority on revitalizing them. ■



## II. AMERICA'S ADVANCED INDUSTRIES: WHAT THEY ARE AND WHY THEY MATTER

**W**hat are advanced industries, and why do they matter? Characterized by their heavy use of technology and technical workers, advanced industries constitute the commercial innovation sector. Specifically, they represent the prime site in developed economies for the conversion of technical invention into industrial-scale business enterprise. In short, these industries anchor American economic well-being.

### What Advanced Industries Are

This report defines advanced industries as those that both conduct large amounts of R&D and employ a disproportionate share of STEM workers. More precisely, Brookings defines advanced industries as those in which R&D spending per worker reaches the top 20 percent of all industries and the share of workers with significant STEM knowledge exceeds the national average. (See Chapter 3 and the methodological appendix online for more background on this definition and related analytic issues.)

Based on this definition, the U.S. advanced industries sector encompasses 50 diverse industries including 35 manufacturing, 3 energy, and 12 service industries. These industries include advanced manufacturing industries such as pharmaceuticals, motor vehicles, aerospace; energy providing industries such as oil and gas extraction and electric power generation; and critical service activities such as R&D services, software design, and telecommunications.<sup>2</sup>

These industries frequently defy easy classification and indeed conventional approaches to industry analysis have tended to obscure their increasing interrelatedness.

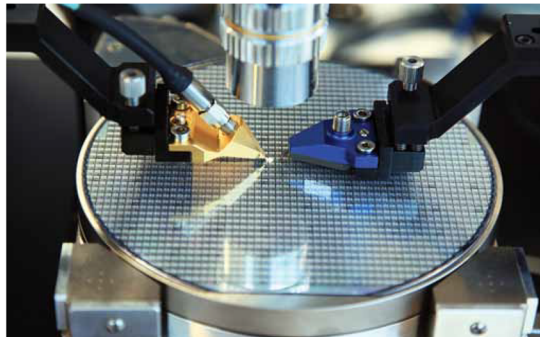
Time-worn delineations, such as those that differentiate between manufacturing and services, or between “low-tech” and “high-tech” goods, categorize industries based on products instead of the inputs and processes that create value (such as R&D and skills). Today, however, the increasing complexity and interconnectedness of the modern production system has eroded the value of such conventional industrial groupings and demands an updated approach to industry analysis.

The conventional distinction between manufacturing and services, for example, has begun to blur as global firms increasingly offer both integrated “end-to-end” solutions that bridge the division between product and service delivery.<sup>3</sup>

Likewise, researchers have questioned the traditional separation between production and innovation in economic analysis.<sup>4</sup> In the past, production occurred on a manufacturing shop floor while innovation was isolated in labs and design facilities. Yet greater technical complexity coupled with shorter product life cycles has driven firms to incorporate design into the assembly process, cutting lead time and modification costs. In this environment, firms require tight links between their research divisions and manufacturing facilities, which often come in the form of real-time exchange between researchers, engineers, and high-skilled production workers.<sup>5</sup>

The concept of “high-tech”—which has tended to refer to the computer production and software industries—has also lost meaning as the “digitization of everything” (driven by the ubiquity of electronics and computing) has pervaded every industry.<sup>6</sup> With smart grid and advanced sensor technology, next-generation refrigerators, for example, may have more lines of computer code than twentieth century desktop computers. For that matter, an auto company like Tesla Motors has an occupational profile similar to a software company. Against this backdrop, the delineation of a single, high-value, advanced industries sector—defined by its innovation and workforce assets and characterized by its converging technologies and business models—helps keep the focus on what matters at a moment of extraordinary economic change.

In this regard, the advanced industry sector is characterized by the fact that it is the portion of the economy within which the most critical technology trends play out most dramatically.<sup>7</sup> Witness how the arrival of disruptive technologies in IT, “big data” analytics, materials science, next-generation genomics, and robotics are transforming even such seemingly mature advanced industries as automotive manufacturing, management consulting, cable programming, and diagnostic laboratories.<sup>8</sup> At the same time, advanced industries are enabling disruptive innovation in other sectors of the economy too. Through the delivery of business services via the cloud computing, the rise of virtual-to-real design techniques, 3-D printing, and real-time logistics, for example, advanced industry products and services are reducing the barriers to entry for innovative entrepreneurs and SMEs in a number of different markets. Transformations underway in retail, healthcare, supply chain management, and even urban transportation are powered by advanced industries.





## Why Advanced Industries Matter for the United States and Its Regions

But why do advanced industries matter so much to society and for the broader economy? Why single out these industries for special attention? At the most immediate level, the advanced industries sector has transformed life and work.

Working often with university and public-sector laboratories, advanced industries helped put the first human on the moon, developed hybrid and electric cars, and are now building out the mobile internet to bring billions of the globe's citizens into the connected world. Likewise, advanced industries have made LASIK, GPS, and TiVo commonplace; delivered blockbuster biotech drugs and high-yield seeds; and driven forward the current revolution in unconventional oil and gas extraction. The iPhone is an icon of advanced industry competitiveness. So, too, are the 787 Dreamliner airplane and Google's self-driving car. To the extent humanity mitigates the worst aspects of climate change, it will owe its progress to advanced industries' expansion of renewable sources such as solar or nuclear energy generation.

But the advanced industries sector also represents a compelling economic fact. As the leading location of technological development and its application in the United States, the sector plays a pivotal role in generating prosperity across the nation.

Specifically, the advanced industries sector:

- ENCOMPASSES MANY OF THE NATION'S MOST CRUCIAL INDUSTRIES.** Advanced industries are in many respects their nations' linchpin industries—the industries that, in developed economies, establish technological advantage and embody national competitiveness. Sizable in their own right, these industries frequently make disproportionate contributions to GDP through above-average productivity, which is a leading predictor of worker wages. Likewise, because of the complexity of their products and services, these industries support long chains of raw materials providers, specialized parts suppliers, and assorted service providers. Although it is certainly true that supply chains are increasingly global, trade data suggest that the United States retains many of their highest-value portions.<sup>9</sup> Economic literature also suggests that advanced industries have high employment and output multipliers—measures of the ancillary economic activity one job spurs elsewhere in the economy—given the above-average wages they pay and their strong links to other sectors of the economy, both for inputs and through their broader impacts.<sup>10</sup> Yet the sector's significance goes far beyond its size. Advanced industries possess outsized economic importance for the nation and its regions. Nearly every advanced industry resides in the traded sector—the sector that competes internationally, sells abroad at least partially, and returns sales revenue to America. Traded sector industries are essential to a nation's prosperity. As innovation experts Stephen Ezell and Robert Atkinson write, “It's simply impossible to have a vibrant national economy without a globally competitive traded sector.”<sup>11</sup> For a nation that has been running significant trade deficits for years, including in “advanced technology products,” advanced industries will be instrumental in reducing them.<sup>12</sup>

Beyond matters of productivity and trade, the advanced industries sector looms large in supporting such national and global objectives as national security, energy independence, food sustainability, health, and rising standards of living.

The aerospace, electronics, and communications industries play a significant role in delivering the goods and services that help nations respond to threats such as terrorism, environmental disasters, and pandemics.<sup>13</sup> The electric power, oil and gas, and scientific research industries are helping the world maintain access to—and store—low-cost, secure sources of energy, including clean energy. (Witness the progress that “cleantech” advanced industries have made in reducing the cost of photovoltaics and boosting the energy density of storage devices.) As the world's population grows, biotechnology industries are enabling the world to feed its population through innovations in plant genomics, high-yield seeds, and improved crop and water management. Likewise, medical, pharmaceutical, genomic, electronic, and “big-data” advanced

industries are all working to advance the health of the nation and world through the development of remote monitoring, new prevention and treatments, and personalized medicines. Consumer-oriented advanced industries such as electronics, computers, motor vehicles, and appliances, for their part, have materially improved household standards of living by expanding purchasing options, bringing time- and money-saving capabilities to the average person, and driving prices down and quality up.<sup>14</sup> In short, U.S. advanced industries are engaged in delivering highly important goods and services that respond directly to the nation's most pressing challenges.

## HOW THE ECONOMIC IMPACT OF ADVANCED INDUSTRIES RADIATES

**H**igh and rising standards of living are generated largely in two ways: through trade and through economic growth. Advanced industries lie at the center of both.

Advanced industries anchor the traded sector, which, by earning money from other locations, serves as the primary generator of wealth for cities, regions, and nations. Furthermore, trade encourages specialization, which increases productivity. The potential to export also encourages investment by promising increased sales, economies of scale, and therefore profits. Advanced industries encompass the competitive heart of the U.S. traded sector—and for that reason pay well.

Yet the advanced industries sector's role in the economy extends well beyond trade. Advanced industries support large numbers of indirect jobs (a multiplier effect) and generate the technologies that enhance productivity and increase economic growth.

The sector's substantial "multiplier effect" on jobs explains why it plays such an outsized role in U.S. employment. As income earned by advanced industries is paid out to employees, suppliers, and service providers, money radiates out to the broader economy, supporting more jobs. The non-traded sector of the economy—where most people work—in fact depends heavily on income from the traded sector.

Yet the impact of advanced industries radiates even further. As Philippe Aghion and Peter Howitt state, "In order to sustain a positive growth rate in output per capita in the long run, there must be continual advances in technological knowledge." Advanced industries represent the prime site of that technological knowledge in the economy. New knowledge and technology in turn enable the economy to increase the value of output from a fixed quantity of inputs. In other words, it powers productivity growth economy-wide, which is the only durable means by which a society's living standards can rise.

In sum, advanced industries are the nation's crown jewel industries because they prime the economy with income, knowledge, and technology. In doing so, they generate employment, value, and progress across the entire economy.

*Sources: Robert Solow, "A Contribution to the Theory of Economic Growth," Quarterly Journal of Economics, 70(1)(1956); Philippe Aghion and Peter Howitt, Endogenous Economic Growth Theory (Cambridge, MA: MIT Press, 1997), p. 11; Douglass North, "Location Theory and Regional Economic Growth," Journal of Political Economy, 63(3) (1955); Paul Romer, "Endogenous Technological Change," Journal of Political Economy, 98(5) (1990); Paul Krugman, The Age of Diminished Expectations (Cambridge, MA: MIT Press, 1994).*

- REPRESENTS A KEY SITE OF INNOVATIVE ACTIVITY.** Related to their orientation toward key national challenges is the fact that advanced industries are the nation's principle locus of industrial innovation. Innovation matters to nations, states, regions, companies, and families because it represents the only viable avenue for high-wage economies to increase productivity and continue to improve their citizens' standard of living in the long run.<sup>15</sup> Advanced industries matter inordinately because, by definition, they draw together society's innovation resources. In particular, they are the primary site of the R&D spending that drives product and process innovation in the economy.<sup>16</sup> As such, the sector is the nation's top source of the innovation that drives increased productivity, which in turn generates increased profits and market share for firms, growth for industries, and broad economic benefits for households, regions, and the nation.<sup>17</sup>

The sector's significance as a source of innovation is likely undercounted. Considering that three-fourths of U.S. firms perform no R&D, economist David Audretsch asks, "Where do innovative firms with little or no R&D get the knowledge inputs?"<sup>18</sup> The answer is from "spillovers" from the most R&D-intensive firms such as those in the advanced industries sector. Because innovative companies cannot capture all of the knowledge generated from their R&D investments, other firms that employ similar processes or create complementary products often acquire the new knowledge through imitation, use, worker turnover, or other ways.<sup>19</sup> So advanced industry innovation investments, activities, and advances "spill over" to other areas. They radiate.

And in some cases, such as with IT products and services, advanced industry technologies have emerged as "general purpose technologies" that have enabled truly significant productivity advances throughout the economy.<sup>20</sup> Consider, for example, the IT ecosystem. Although iconic firms such as IBM, AT&T, Microsoft, and Google created the IT ecosystem, thousands of other firms and entrepreneurs in nearly every other industry have reaped the bulk of the economic rewards. Altogether, the application of IT advancements in the United States has been responsible for more than 30 percent of labor productivity growth economy-wide over the past decade.<sup>21</sup>

### HOW ADVANCED INDUSTRY INNOVATIONS SPILL OVER TO THE LARGER ECONOMY

No technology better epitomizes how advanced industries support U.S. economic growth through innovation and its wide adoption than information technology (IT). Prior to the mid-1990s productivity growth from IT remained almost exclusively within those firms producing software and hardware (all in advanced industries). Yet in the decade following 1995, productivity gains from IT came predominately from firms outside of the IT sector, particularly in high-value advanced industries such as management and R&D consulting, medical devices, and precision instrument manufacturing. These firms began leveraging IT to improve operations and to grow. During this period, IT was responsible for two-thirds of U.S. productivity growth, despite the IT sector only employing 2.5 percent of the workforce directly. Research by Jorgenson, Ho, and Samuels shows that total factor productivity increased sharply in sectors that used IT extensively during the 1990s and fell in those that did not. During the years 1995-2000 sectors using IT registered 10 times higher total factor productivity than other sectors.

Since then, the retail, wholesale, and hospitality sectors have begun to invest heavily in IT, and IT was responsible for more than one-third of total labor productivity growth between 2002 and 2012. The further dissemination of IT into large and conspicuously lagging sectors—namely health care and education—promises even greater productivity gains.

The 30-year trajectory of IT illustrates a critical economic point: U.S. economic growth is contingent on waves of game-changing technologies that are typically introduced by a subset of advanced industry firms, then adopted by whole industries, and finally diffused into every corner of the economy.

*Sources: Dale Jorgenson and others, "Information Technology and U.S. Productivity Growth: Evidence from a Prototype Industry Production Account," Journal of Productivity Analysis, 35(2) (2011).*

Information technology is not the only general purpose technology generating a sizable impact. Others include the genomic revolution, the arrival of advanced material science, and emerging new developments in advanced robotics and machine learning.<sup>22</sup> For example, McKinsey & Co. estimates that the economic impact of gene sequencing in health care, agriculture, and biofuels will equal more than \$1 trillion during the next decade.<sup>23</sup> In the coming decades, new general purpose technologies introduced by the advanced industries sector, such as nanotechnology and advanced energy storage, may emerge as major sources of economic growth.

- TRAINS AND EMPLOYS MUCH OF THE NATION'S STEM WORKFORCE.** The sector also factors significantly in building and maintaining the nation's skilled workforce. A storehouse of the nation's STEM knowledge base, the sector also serves as a critical repository of skilled workers that over time flow out into the rest of the economy. STEM workers—from aerospace engineers to software developers, materials engineers, biochemists, power plant operators, mechanical engineers, and skilled technicians—matter because they make and apply the inventions that sustain innovation and growth.<sup>24</sup> At the professional level, highly trained engineers and scientists keep American business on the cutting edge through invention and entrepreneurship. At the sub-bachelor's level, skilled technicians produce, install, maintain, and repair the products and machines patented by researchers, allowing firms to reach their markets, reduce product defects, create process innovations, and enhance productivity. Moreover, as one of this paper's co-authors has observed elsewhere, although these technicians may not be directly involved in invention, they are critical to the implementation of new ideas and advise researchers on the feasibility of design options, material choices, cost factors, and other practical aspects of technology development and deployment.<sup>25</sup>

Advanced industries, in this respect, not only employ a core cadre of the top workers in hundreds of the nation's occupations, but they also contribute to the retraining and upskilling of workers throughout the rest of the economy.<sup>26</sup> STEM workers, after all, introduce STEM skills into other industries, including management and professional services, finance, and health care.<sup>27</sup> In that sense, the impact of advanced industries again radiates outward through the economy.

\* \* \*

And yet advanced industries are not just a remote influence on national well-being. By dint of their uneven distribution across U.S. states and regions they represent a critical determinant of metropolitan prosperity as well.

To see this one has only to think of Raleigh's clusters of software, telecommunications, and medical and electrical equipment manufacturing; Wichita's strong aerospace industry; or San Diego's substantial IT, biotech, software, and scientific consulting activities.

Advanced industries tend to cluster geographically because they depend on proximity to shared innovation resources such as universities and national laboratories; access to pools of skilled labor; and myriad "ecosystem" benefits including information spillovers, local supply chain density, and available networks of related firms, specialized suppliers, and service providers.<sup>28</sup> In doing so, these industries confer myriad economic benefits on their home regions.

Not only do metropolitan area economies profit by definition from the presence of these innovation- and STEM worker-intensive industries whose patenting, training, and value chains are associated with increased productivity growth, high-wage employment, and entrepreneurship.<sup>29</sup> In addition, regions can benefit from powerful feedback loops when they accrue sufficient densities of advanced industry activity. As more firms cluster, the accumulation of complementary economic activity—cutting-edge research, bespoke training programs, specialized suppliers, and industry associations—only increases the attractiveness of the locale for other firms and new investments. This pooling can in turn accelerate the emergence of new solutions and new hybrid industries as technologies converge and combine.<sup>30</sup> In this respect, the benefits to regions can be exponential.

Such clustering dynamics help explain the emergence of a flourishing space technology cluster in Denver and a vibrant smart buildings specialization in Seattle. It also helps explain the emergence of urban "innovation districts" in many cities as firms, researchers, and their partners converge within urban spaces to absorb crucial market information and be close to fast-changing ideas.<sup>31</sup> These physically compact, transit-accessible collaboration nodes—like those that have emerged at Kendall Square in Cambridge, or in Seattle's South Lake Union area—are one of the most visible ways in which the evolving needs of advanced industries are beginning to change spatial development patterns too.

## DISRUPTIVE TECHNOLOGIES DEFINE THE ADVANCED INDUSTRIES SECTOR

Numerous breakthrough technologies are not only transforming the advanced industries sector but in many respects redefining it. The cross-cutting nature of many of these disruptive technologies reinforces the ongoing convergence of production and innovation, manufacturing and services, and material and digital. Among the most defining technology trends are:

- **Additive manufacturing / 3-D printing:** 3-D printing is the additive process of building objects through layering. Additive manufacturing has the potential to substantially reduce the cost and time of prototyping in production industries and could also enable the mass customization of products.
- **Advanced materials:** Advanced materials are developed from compounds at a molecular level through applied physics, materials science, and chemistry. Advanced materials hold the prospect of reducing the weight of vehicles without losing strength, creating efficient clean energy, and more durable machinery.
- **Advanced robotics:** Automation and advanced robotics allow for greater speed, consistency, and complexity in the production process. Although robotics are not new, only recently has artificial intelligence become sophisticated enough to automate nonroutine tasks such as assembly line quality control monitoring.
- **Big data/ advanced analytics:** Big data refers to data sets that are too large for traditional computing tools and require unique software and skilled technicians to store, manage, and analyze. Big data are important for not only managing complex global supply chains or customer relationships, but also learning and innovation in the production process.
- **Cloud computing:** Cloud technology allows nearly all computing applications to be delivered through networks or over the Internet. By radically reducing operating costs, cloud computing can potentially revolutionize business models in every industry from retail to software development.
- **Internet of Things:** Advanced software, robotics, cheap sensors, and network connectivity are combining to allow objects to interact digitally. As technologies improve, networked smart devices can bring new dynamism to old tasks and systems.
- **Next-generation genomics:** Genomics is the study of DNA to unlock new organic knowledge. Low-cost gene-sequencing machines hold promise for revolutionary drug treatments, new biofuels, and drought- and pest-resistant crops. Coming technologies will likely even yield radical innovations in gene manipulation.

Sources: McKinsey Global Institute, “Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy” (2013); President’s Council of Advisors on Science and Technology, “Capturing Domestic Competitive Advantage in Advanced Manufacturing” (2012).

In short, advanced industries are vital to both the nation and its regions. These industries anchor the traded sector. They are the leaders in U.S. innovation and well-compensated technical employment, and they represent the focal point of U.S. technology convergence and transformation—locally and nationally. Identifying an advanced industries sector in the United States creates a clear view of the industries that matter most in driving U.S. prosperity. ■



### III. DEFINING AND MEASURING ADVANCED INDUSTRIES

To identify America's advanced industries this analysis developed an industry-level approach that focuses on industries' efforts to research and develop new products, capabilities, and techniques combined with their employment of technical workers.<sup>32</sup>

The two concepts—industry investment in R&D and a technically skilled workforce—are related but distinct. R&D speaks to the centrality of innovation to an industry, whether through the invention of new technologies, products, and processes or different combinations or improvements of existing ones. Such discoveries increase productivity, create new markets, and push frontiers in established product spaces.<sup>33</sup> Ultimately, they enable society to generate more output for any given set of inputs and enjoy rising standards of living in the process.<sup>34</sup>

The presence of technical workers, meanwhile, speaks not only to the workers who conduct R&D but also to those who apply its outputs. For a company to realize the value of its discoveries or those of its clients, the production staff—whether factory workers or software developers—must understand and implement the new processes; make refinements, fixes, and repairs to them; and provide informed feedback to the researchers and the company's suppliers.<sup>35</sup> The sales and management staff, to varying degrees, also need to understand at least some of the technical aspects of the company's products and those of its suppliers and customers.

Accordingly, this analysis presumes that assessing two terms—the amount an industry spends on R&D activities and the degree to which the industry's occupations require a high degree of technical or STEM knowledge—provides a cogent framework for identifying the most advanced industries in the economy.

**R&D spending**, for its part, approximates the resources marshalled in the pursuit of new products, processes, and technologies. Measures of R&D intensity—R&D expenditures as a share of output or per worker—capture the basic innovative stance of an industry. In high-wage, high-tech economies, R&D spending is a prominent driver of technological innovation and economic growth and has significant spillover benefits.<sup>36</sup> This is particularly true at the industry level.

For their part, **STEM workers** encompass an industry's ability to both innovate and realize the full value of innovations, whatever their origins. In this sense, STEM workers are closely involved in both the development of new techniques and technologies and in their adoption and diffusion.

Accordingly, this report employs a relatively new method to determine the STEM-knowledge intensity of an industry's workforce. The method utilizes the rich Occupational Information Network (O\*NET) database, produced by the Department of Labor's Employment and Training Administration. This database collects detailed data from workers on various aspects of their jobs and job requirements. These data allow for all occupations within an industry to be evaluated on the basis of the STEM knowledge they require. STEM knowledge categories include science (a composite measure that includes biology, chemistry, and physics), math, computer science, and engineering (a composite measure that includes engineering, mechanical, and design knowledge).

In order to operationalize the full definition, this analysis deems "advanced" those industries—defined at the four-digit North American Industry Classification System (NAICS) code level—that both spend a large amount on R&D relative to the size of their workforce and also rely on numerous STEM workers.

More specifically, the report categorizes industries as "advanced" when both:

- R&D spending exceeds \$450 per worker, as measured by the National Science Foundation's 2009 Business R&D and Innovation Survey (BRDIS), which equates to roughly the 80th percentile of spending intensity<sup>37</sup>
- Over 21 percent—above the U.S. average—of an industry's workforce can be found in occupations requiring a high-degree of STEM knowledge as defined by O\*NET<sup>38</sup>

This definition is unique in the details of how STEM and R&D are measured and in the cut-offs used.<sup>39</sup> In particular, this report adopts R&D expenditures per worker as a principle metric rather than the more conventional R&D expenditures as a share of revenue.

This decision bears further elaboration. Using employment rather than revenue is advantageous for a number of reasons. The first is theoretical. Both labor and R&D are inputs into the production process, whereas revenue is an output. However, the per worker measure gets closer to the ideal metric: the share of an industry's workforce devoted to R&D. Empirically, the per worker measure also performs better. Using data from the Organization for Economic Cooperation and Development (OECD) for member countries, R&D spending per worker is more highly correlated with average income or patents per worker than R&D as a share of GDP.<sup>40</sup> Likewise, across U.S. industries, patenting per worker is more highly correlated with R&D per worker than R&D as a share of sales.<sup>41</sup>

To determine the STEM knowledge intensity of individual industries, meanwhile, this report employs a novel and more precise method developed by Jonathan Rothwell, a coauthor, the details of which are reported elsewhere.<sup>42</sup> Ultimately, the approach undertaken here identifies 50 distinct advanced industries. Thirty-five are in the manufacturing sector, three are in the energy sector, and 12 are service industries.



**The advanced industries sector is composed of 50 individual R&D- and STEM knowledge-intensive industries**

		Definitional Criteria		Summary Statistics	
4-Digit NAICS Code	Industry Title	R&D Spending per Worker (2009)	Share of High STEM Knowledge Occupations (2012)	U.S. Employment (2013)	U.S. Output (2013) (thousands)
MANUFACTURING					
3241	Petroleum and Coal Products*	\$693	42%	111,200	\$80,188,100
3251	Basic Chemicals	\$14,679	50%	141,600	\$60,674,000
3252	Resins and Synthetic Rubbers, Fibers, and Filaments	\$11,110	46%	91,500	\$34,691,800
3253	Pesticides, Fertilizers, and Other Agr. Chemicals	\$33,109	43%	37,900	\$13,503,100
3254	Pharmaceuticals and Medicine	\$143,110	48%	277,100	\$141,516,200
3259	Other Chemical Products*	\$45,778	29%	82,300	\$25,104,500
3271	Clay Products	\$6,308	30%	39,300	\$3,885,300
3279	Other Nonmetallic Mineral Products	\$4,558	22%	70,300	\$7,317,600
3311	Iron, Steel, and Ferroalloys	\$2,705	29%	90,800	\$15,203,100
3313	Aluminum Production and Processing	\$4,329	32%	57,900	\$7,355,600
3315	Foundries	\$1,372	36%	126,600	\$13,991,200
3331	Agr., Construction, and Mining Machinery	\$11,709	39%	250,600	\$36,446,400
3332	Industrial Machinery	\$23,672	50%	107,000	\$15,796,400
3333	Commercial and Service Industry Machinery	\$13,330	42%	87,200	\$11,925,200
3336	Engines, Turbines, and Power Trans. Equipment	\$13,557	45%	97,900	\$14,842,400
3339	Other General Purpose Machinery	\$5,293	42%	254,800	\$32,757,200
3341	Computers and Peripheral Equipment	\$60,339	71%	158,800	\$60,734,100
3342	Communications Equipment	\$91,428	57%	102,400	\$25,596,000
3343	Audio and Video Equipment	\$28,074	32%	19,600	\$3,970,800
3344	Semiconductors and Other Electronic Components	\$49,612	50%	374,900	\$83,242,500
3345	Navigation, Measurement, and Control Instruments	\$14,265	58%	393,000	\$88,975,600
3346	Magnetic and Optical Media	\$5,919	28%	19,000	\$4,701,500
3351	Electric Lighting Equipment*	\$821	28%	47,300	\$6,166,800
3352	Household Appliances*	\$821	27%	57,600	\$7,174,300
3353	Electrical Equipment*	\$821	37%	144,200	\$20,528,800
3359	Other Electrical Equipment and Components*	\$821	37%	124,900	\$16,297,200
3361	Motor Vehicles	\$48,461	27%	178,100	\$41,639,800
3362	Motor Vehicle Bodies and Trailers	\$759	23%	134,100	\$17,079,200
3363	Motor Vehicle Parts	\$6,791	36%	508,000	\$79,621,800
3364	Aerospace Products and Parts	\$20,501	60%	492,500	\$96,230,000
3365	Railroad Rolling Stock	\$2,782	32%	25,200	\$3,641,600
3366	Ship and Boat Building	\$4,640	39%	134,300	\$17,139,100
3369	Other Transportation Equipment	\$13,476	30%	32,300	\$4,548,600
3391	Medical Equipment and Supplies	\$24,343	33%	306,700	\$49,965,200
3399	Other Miscellaneous	\$8,547	23%	273,000	\$33,273,900
ENERGY					
2111	Oil and Gas Extraction*	\$613	58%	197,700	\$212,280,600
2122	Metal Ore Mining	\$836	48%	44,500	\$19,094,400
2211	Electric Power Generation, Trans., and Distribution	\$2,173	47%	394,000	\$219,849,500
SERVICES					
5112	Software Publishers	\$80,977	70%	297,200	\$116,417,500
5152	Cable and Other Subscription Programming	\$1,370	36%	72,500	\$33,131,500
5172	Wireless Telecommunications Carriers	\$455	40%	155,300	\$49,110,500
5174	Satellite Telecommunications	\$5,948	69%	9,700	\$3,903,200
5179	Other Telecommunications	\$1,999	57%	84,300	\$32,904,700
5182	Data Processing and Hosting*	\$1,020	56%	267,500	\$45,588,500
5191	Other Information	\$27,476	40%	194,200	\$45,801,200
5413	Architecture and Engineering	\$738	74%	1,353,700	\$179,136,700
5415	Computer Systems Design	\$7,225	75%	1,698,400	\$246,466,900
5416	Mgmt., Scientific, and Technical Consulting	\$1,950	39%	1,177,100	\$166,593,900
5417	Scientific Research and Development	\$13,627	73%	635,700	\$112,426,700
6215	Medical and Diagnostic Laboratories	\$988	50%	241,100	\$21,434,000
Advanced Manufacturing Industries				5,449,900	\$1,175,724,700
Advanced Energy Industries				636,200	\$451,224,500
Advanced Services Industries				6,186,700	\$1,052,915,300
Advanced Industries Total				12,272,800	\$2,679,864,500

\* = Imputed from 3-digit NAICS by Brookings

Sources: Brookings analysis of National Science Foundation, Bureau of Labor Statistics, and Moody's Analytics data



This approach has strengths and weaknesses. A strength is that the methodology allows for the use of standard industry data to define a single coherent body of high-value economic activity. By applying carefully crafted criteria to a familiar unit of analysis (four-digit NAICS industries), this method identifies a large group of highly sophisticated industries that previous studies have not aggregated. The use of NAICS-based industry data, meanwhile, permits comparability across a large body of standardized public and private statistics at the international, national, and regional scales.<sup>43</sup>

A key shortcoming here includes the difficulty of classifying individual firms whose activities, in practice, span multiple industries. For example, that Amazon is an “advanced” firm is hard to dispute. However, Amazon’s classification as a retailer (NAICS 4541: electronic shopping and mail-order houses) technically precludes its inclusion in the advanced industries sector, even though some of the company’s individual physical establishments specializing in, for example, computer systems design or software programming, would be included. In a similar fashion, the present industry-oriented definition may miss pockets of sophisticated activities in other industries. Conversely, the method likely captures some relatively unsophisticated activities and establishments within industries that exhibit an “advanced” profile in aggregate national data but not necessarily in every particular region (think for example of the full range of firms and establishments classified in the “motor vehicle parts manufacturing” industry across the country).

\* \* \*

Overall, this analysis advances a fresh scan of the diverse range of sophisticated industries that represents the most advanced portion of the American economy. For a more in-depth discussion of the data sources and method employed as well as information on the methods employed for calculating multiplier effects, patenting rates, price effects, worker characteristics, hiring difficulty, regional variation, and international comparisons, please see the online appendix accompanying this report. ■

**“This analysis presumes that assessing two terms—the amount an industry spends on R&D activities and the degree to which the industry’s occupations require a high degree of technical or STEM knowledge—provides a cogent framework for identifying the most advanced industries in the economy.”**



## IV. FINDINGS: ADVANCED INDUSTRIES IN THE UNITED STATES AND GLOBALLY

**A**n analysis of the 50 industries that comprise the U.S. advanced industries sector finds that, notwithstanding recent output and employment gains, the sector's global prominence is challenged:

### **U.S. advanced industries generate a large and rising share of the nation's GDP and, after years of decline, have led the post-recession employment recovery**

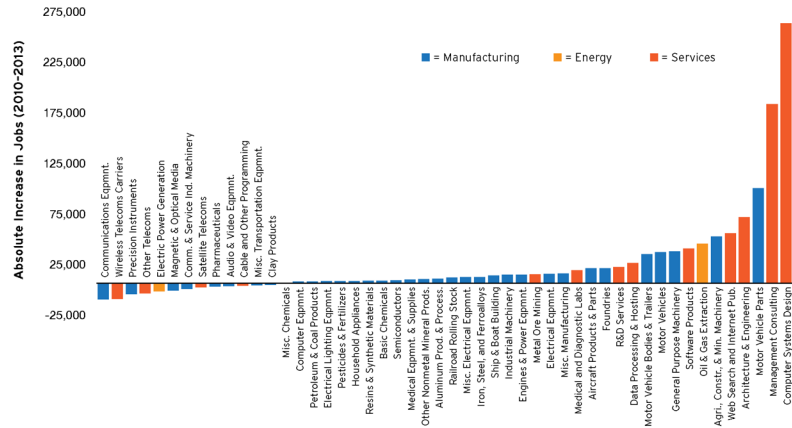
As of 2013, the 50 advanced industries in the United States employed 12.3 million U.S. workers, or nearly 9 percent of total employment. To put that in context, the sector employs 4 million more workers than the U.S. financial, insurance, and real estate sectors combined but 5 million fewer than the health care and social services sector. And yet, even with this modest employment base, U.S. advanced industries generate \$2.7 trillion worth of output annually, or 17 percent of U.S. GDP. That is more than any other sector, including health care, finance, or real estate.

With that said, the number of jobs in the sector has barely budged since 1980 even as its output has soared. Looking at the long-term trend, the sector added a modest one million jobs from 1980 to 2013 but saw its share of total U.S. employment slip from 11.6 to 8.7 percent. During the period, however, the sector contributed a hefty 22 percent to the increase in GDP, expanding at a rate of 5.4 percent annually, 30 percent faster than the economy as a whole.

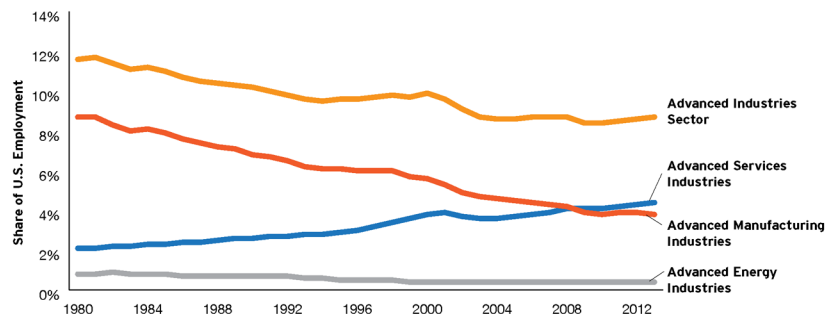
In the nearer term and since the Great Recession both employment and output levels in the sector rose dramatically from 2010 to 2013. Advanced industries have added nearly one million jobs since 2010, with employment and output growth rates 1.9 and 2.3 times higher, respectively, than in all other sectors combined.

Advanced services led this post-recession surge and created 65 percent of the new jobs in the sector. Computer systems design alone generated 250,000 new jobs. Certain advanced manufacturing industries—especially those involved in transportation equipment—have added thousands of jobs during the recovery too.

### The advanced industry sector's post-recession employment surge has been broad-based but led by services



### Services now account for a larger share of advanced industry employment than manufacturing



Lying behind these trends is a diverse and evolving industry composition within the sector, which cuts across three major sub-sectors: manufacturing, energy, and services.

In 1980, manufacturing industries employed the vast majority of the advanced industries workforce. However, decades of technological and structural change in the global economy saw the advanced manufacturing sector shed 3 million net jobs between 1980 and 2013. As a consequence, manufacturing's share of total advanced industries employment fell from 75 percent to 44 percent during the period. Services now constitute the largest subsector of advanced industries. Within

manufacturing, 32 of 35 individual advanced manufacturing industries lost jobs between 1980 and 2013—12 of which lost at least 100,000 jobs, including the aerospace and navigational and precision instrument manufacturing industries, which each shed more than 200,000 positions.

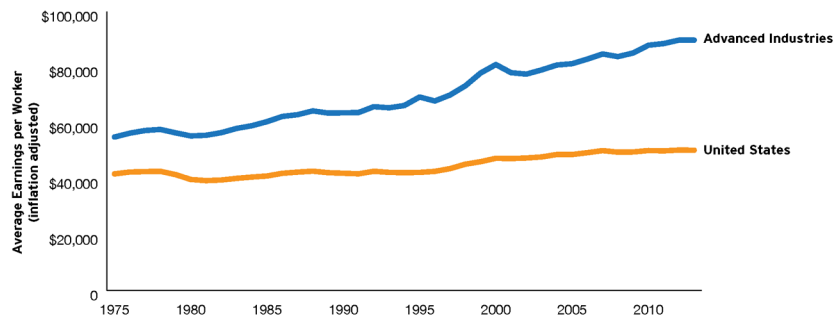
Nevertheless, many advanced manufacturing industries continue to employ large numbers of workers, and employment in motor vehicle body and trailer, medical equipment, and pharmaceutical manufacturing has increased since 1980. In fact, employment increased in 26 of the 35 advanced manufacturing industries between 2010 and 2013. During that time, advanced manufacturing industries outperformed other manufacturing industries on both annual employment growth (1.8 versus 1.0 percent per year) and output growth (1.8 versus 0.4 percent per year), hinting at something potentially more durable than the standard bounce-back following a recession.

At the same time, advanced services have demonstrated enormous strength, surpassing even advanced industries manufacturing in employment. Employment in these industries swelled by 3.8 million between 1980 and 2013, achieving a 3.2 percent annual average growth rate. This compares with 1.2 percent growth for the overall U.S. economy. Composing just over one-half of the advanced industries workforce and 4.4 percent of the U.S. workforce, advanced service providers now generate 9.2 percent of GDP—up from 3.0 percent in 1980—after three decades of spectacular growth in value-added.

Computer systems design led all advanced industries in job growth by adding 1.5 million jobs between 1980 and 2013 with swift annual average employment and output growth rates of 7.0 percent and 8.3 percent, respectively. Management, scientific, and technical consulting services added another one million jobs. Architecture and engineering services, software publishers, and scientific research and development services together added another 0.9 million jobs during the period.

Energy industries constitute the smallest subset of advanced industries and employ 6 percent of all workers in the sector. Advanced energy industries include electric power generation, transmission, and distribution; oil and gas extraction; and metal ore mining.<sup>44</sup> Each industry lost jobs between 1980 and 2013, and their shares of total U.S. output declined. During the recovery period of 2010 to 2013, however, oil and gas extraction added 39,000 jobs and realized 10 percent annual average GDP growth, likely propelled by the boom in oil and gas exploration fueled by new drilling technologies.

### Since 1975, average earnings in advanced industries have increased almost five times as fast as those in the overall economy



## Advanced industries support extremely high-quality economic opportunities for workers, regions, and the nation

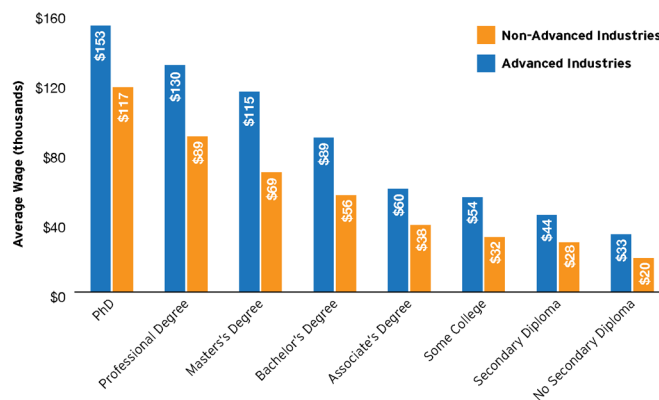
Workers in advanced industries are extraordinarily productive. Each worker generates approximately \$210,000 worth of output compared with \$101,000 for the average worker outside advanced industries.<sup>45</sup> Moreover, productivity in the sector has been rising for decades, and increased at a rate more than twice that of the overall U.S. economy (3.2 versus 1.3 percent annual average growth) between 1980 and 2013.<sup>46</sup> That additional value leads to higher tax revenue, profits, and salaries, much of which eventually contributes to local and domestic business activity.

Advanced industries compensate their workers handsomely and, in contrast to the rest of the economy, wages are rising sharply. In 2013, the average advanced industries worker earned \$90,000 in total compensation.<sup>47</sup> This nearly doubled the \$46,000 in total compensation earned by the average worker in other sectors. Absolute earnings in advanced industries grew by 63 percent between 1975 and 2013, after adjusting for inflation. This compares with just 17 percent for the average worker outside the sector.<sup>48</sup>

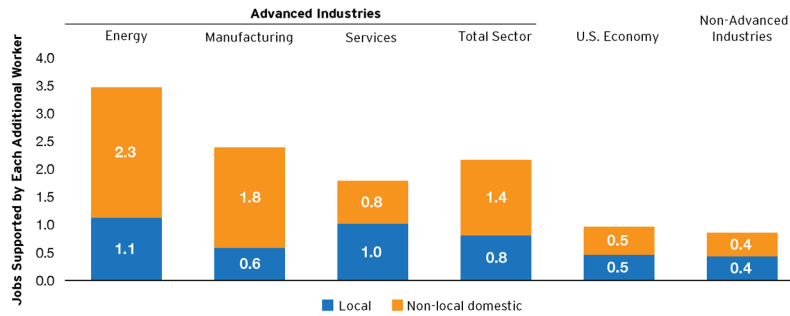
Even workers with minimal education can earn salaries that far exceed their peers in other sectors. Advanced industries workers with some college but no degree earn \$53,000 a year, on average, and those with an associate's degree earn \$58,000. This compares with \$31,000 and \$38,000, respectively, for their counterparts outside the sector. In fact, advanced industries workers with an associate's degree earn more than those with a bachelor's degree in other industries, who average \$55,000 annually. Those working in the sector with a graduate education can expect to earn well above six figures whether they have a master's, PhD, or professional degree.

High earnings and strong earnings growth are typical in nearly all 50 advanced industries. Of the 50, only one (motor vehicle body manufacturing) pays its average worker less than the average worker in other industries. Forty-three of the 50 experienced faster salary growth between 1975 and 2013 than the national average (13 percent) of other industries. Within the sector, advanced services showed the highest salary growth.<sup>49</sup>

### Advanced industries offer a significant wage premium at every level of education



### Powerful multiplier effects mean every new advanced industry job supports more than two others



Advanced industries also support much deeper supply chains than most other industries. Advanced industries purchase \$236,000 in goods and services per worker from other businesses annually. This compares with \$67,000 among other industries. Twenty percent of that spending stays local, and 69 percent stays within the United States.

Spending by advanced industries businesses and workers sustains and creates new jobs to an extraordinary degree. Every new advanced industries job creates 2.2 jobs domestically—0.8 jobs locally and 1.4 jobs outside of the region. This means that in addition to the 12.3 million workers employed by advanced industries, another 27.1 million U.S. workers owe their jobs to economic activity supported by advanced industries through their supply chains and their employees' consumption. Directly and indirectly, in other words, the advanced industries sector supports over 39 million jobs, over one-fourth of the U.S. workforce.

This multiplier effect is significantly higher than other industries. On average in other industries, new jobs create only one additional domestic job—0.4 jobs locally and 0.6 jobs outside the region. Advanced industries, therefore, provide communities and the nation roughly two to three times the indirect employment impact of other industries.

### The advanced industries sector is highly metropolitan and varies considerably in its composition across regions

Advanced industry production takes place principally in metropolitan areas. Altogether the country's 100 largest metropolitan areas contain 70 percent of all U.S. jobs in the sector, and the country's full list of 378 metropolitan areas together contain 91 percent of all jobs in advanced industries. Large metropolitan areas contain at least four out of five U.S. workers in 12 individual advanced industries, among them communications equipment manufacturing, data processing and hosting, and software publishing. Two advanced industries—audio and video equipment manufacturing and satellite telecommunications—are located exclusively in large metropolitan areas.

Moreover, the advanced industries that are most concentrated in large metropolitan areas (typically services industries) also tend to be the fastest growing. Advanced industries that are over-represented in large metropolitan areas—those in which the share of industry employment in large metropolitan areas exceeds 67 percent, the economy-wide benchmark—created 2.5

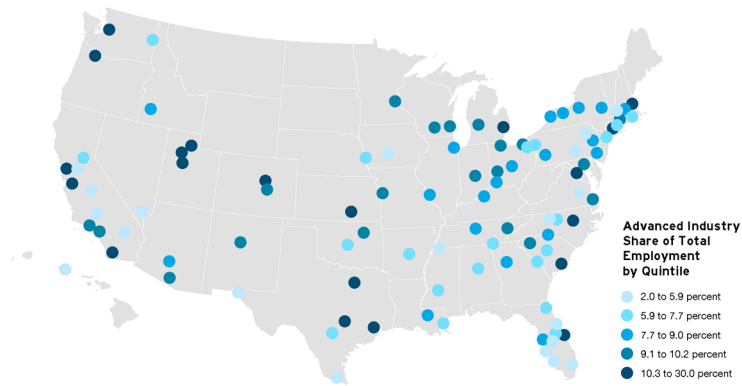
**More than two-thirds of the 15 large metro areas with the highest advanced industry intensities can be found in the west or the Sun Belt**

Rank (Intensity)	Metro Area	Advanced Industry Share of Total Area Employment (Intensity) (2013)	Advanced Industry Employment (2013)	Share in Manufacturing	Share in Services	Share in Energy
1	San Jose-Sunnyvale-Santa Clara, CA	30.0%	291,700	46.1%	53.8%	0.1%
2	Seattle-Tacoma-Bellevue, WA	16.0%	295,000	44.8%	54.8%	0.4%
3	Wichita, KS	15.5%	46,800	84.6%	12.8%	2.5%
4	Detroit-Warren-Dearborn, MI	14.8%	279,400	49.4%	48.7%	1.9%
5	San Francisco-Oakland-Hayward, CA	14.0%	297,200	23.2%	76.4%	0.4%
6	Washington-Arlington-Alexandria, DC-VA-MD-WV	13.7%	503,500	6.0%	92.6%	1.4%
7	Palm Bay-Melbourne-Titusville, FL	13.4%	26,600	62.5%	36.4%	1.1%
8	Boston-Cambridge-Newton, MA-NH	13.3%	338,900	30.7%	68.0%	1.3%
9	Houston-The Woodlands-Sugar Land, TX	12.8%	361,000	38.3%	42.3%	19.4%
10	San Diego-Carlsbad, CA	12.3%	176,300	37.2%	61.5%	1.3%
11	Austin-Round Rock, TX	12.1%	106,300	35.0%	62.6%	2.4%
12	Provo-Orem, UT	12.0%	25,100	32.5%	66.9%	0.6%
13	Raleigh, NC	11.7%	64,400	26.6%	72.2%	1.2%
14	Ogden-Clearfield, UT	11.3%	26,500	63.8%	35.4%	0.8%
15	Salt Lake City, UT	11.1%	71,600	40.7%	56.0%	3.4%
	<b>United States</b>	<b>8.7%</b>	<b>12,284,000</b>	<b>44.4%</b>	<b>50.4%</b>	<b>5.2%</b>

million jobs between 1980 and 2013, growing more than 40 percent. Meanwhile, employment in industries that are under-represented in large metropolitan areas such as metal ore mining and foundries declined by 2 million, or 35 percent.

Jobs in advanced industries are not confined to only a small number of places, however. Every large metropolitan area contains at least a few thousand of them. Not unexpectedly, the country's largest metropolitan areas generally contain the largest number of advanced industry jobs. **New York** leads the nation with 630,000 workers in advanced industries, followed by **Los Angeles** (513,000), **Washington, D.C.** (503,000), **Chicago** (405,000), **Houston** (361,000), and **Boston** (339,000).

**Advanced industries' share of total employment varies significantly across major metropolitan areas**



Relative to total metro area employment, however, **San Jose**, emerges as the nation's leading hotspot for advanced industries, with 30 percent of its workforce employed in the sector. **Seattle** follows with 16.0 percent of its jobs in advanced industries. **Wichita, KS** (15.5 percent), **Detroit** (14.8 percent), and **San Francisco** (14.0 percent) follow that. Overall, advanced industries account for more than one in 10 jobs in nearly one-fourth of the country's major metropolitan areas.

The sector's share of the workforce falls below 5 percent, or one in 20 workers, in 10 of the country's 100 largest metropolitan areas, however. At the far end of the spectrum, advanced industries employ only 3.9 percent of the workforce in **Honolulu, HI**. The share in **Las Vegas** is 3.6 percent; **Fresno, CA**, 3.2 percent; **Stockton, CA**, 2.8 percent; and, finally, **McAllen, TX**, 2.0 percent. To put this in perspective, a worker in **San Jose** is 15 times more likely to be in an advanced industry than a worker in **McAllen**.

### SMALL AND MID-SIZED METROPOLITAN AREAS EXHIBIT THEIR OWN ADVANCED INDUSTRY STRENGTHS

**A**lthough advanced industries are highly concentrated in large metropolitan areas, 1.9 million advanced industries jobs (15 percent of the country's total) can be found in the nation's many small- and mid-sized metropolitan areas.

Those smaller metro areas with large advanced industry bases tend to fall into two categories: economies dominated by manufacturing, on the one hand, and concentrated clusters of diverse advanced industry activity, on the other. The former are typically in the Midwest while the latter tend to be near anchor institutions such as universities or laboratories throughout the country.

Among the mid-sized metropolitan areas specializing in advanced manufacturing, six stand out: **Columbus, IN** (where advanced industries account for 29.9 percent of all jobs, many with Cummins), **Elkhart, IN** (where the sector supports 27.3 percent of all employment), and **Kokomo, IN** (22.5 percent), as well as **Midland, MI** (15.6 percent; home to Dow Chemical), **Peoria, IL** (13.7 percent; home to Caterpillar), and **Fond du Lac, WI** (13.4 percent). These metropolitan areas are typically home to a few large enterprises in addition to numerous smaller, specialized manufacturers, often part of the automotive industry supply chain.

The metropolitan areas with more diversified clusters tend to concentrate the dynamism and diversity of larger metropolitan hubs into compact metro areas. Places such as **Huntsville, AL** (21.5 percent of all jobs); **Boulder, CO** (21.3 percent); **Durham, NC** (15.7 percent); and **Manchester, NH** (13.0 percent) combine multiple specialties spanning both manufacturing and services. In part because of spillovers, collaboration, and networks emanating from their research-intensive anchor institutions, these clusters focus frequently on scientific pursuits.

On the whole, however, advanced industries are sparser in small and mid-sized metropolitan areas. In the average large metropolitan area, 8.5 percent of jobs are in advanced industries. In the average smaller metropolitan area, by contrast, 6.9 percent of jobs are in advanced industries, and small metro areas generally exhibit less diversity in their advanced industrial bases than do large ones.

Advanced industries in U.S. metropolitan areas come in a variety of configurations. For most places with significant concentrations of activity, a key distinction is between those more oriented towards providing services and those more oriented towards producing goods.<sup>50</sup> A handful of places have no significant strength in either, while a small minority of metropolitan areas combine great strength in both sectors.

Of the country's 100 largest metropolitan areas, 37 contain relatively large and manufacturing-oriented advanced industry bases. Among those manufacturing-oriented metro areas, **Grand Rapids, MI**; **Ogden, UT**; **Portland, OR**; **Toledo, OH**; and **Wichita, KS**, are the five metropolitan areas most specialized in advanced manufacturing industries, employing between 6 and 13 percent of the entire workforce. In Wichita, the aerospace industry provides the bulk of advanced industry



employment. In Ogden, Toledo, and Grand Rapids, motor vehicle-related manufacturing dominates, while Portland specializes in semiconductors.

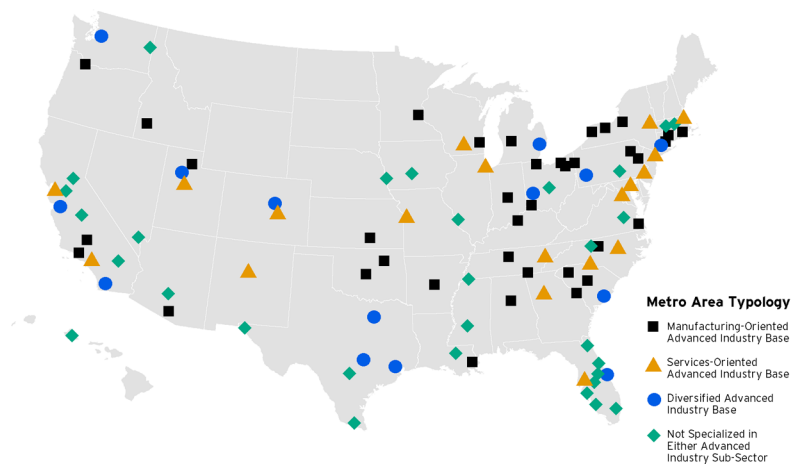
The energy subsector is both smaller more concentrated. In no major metropolitan area does energy employment define the advanced industry base. However, seven metropolitan areas register a significant specialization in energy industries.<sup>51</sup> **Bakersfield, CA; Birmingham, AL; Oklahoma City;** and **Tulsa, OK**, lead the way, joined by **Syracuse, NY**, and **Columbia, SC**, which host large power generation facilities.

Services, meanwhile, predominate in 19 major metropolitan areas. **Boston; Provo, UT; Raleigh, NC; San Francisco**, and **Washington, DC**, have the highest shares of advanced services employment, ranging from 8 to 11 percent of total metropolitan area jobs. In San Francisco, Washington, DC, and Boston, computer systems design, management consulting, and scientific research and development services lead. Computer systems design is also the largest industry in Raleigh and Provo, where software also makes a large contribution.

Finally, two groups of metropolitan areas have relatively balanced assortments of advanced industries. In 30 of the country's largest 100 metropolitan areas, none of the three advanced industry subsectors employs an above average share of the workforce. In addition to places where the advanced industry base is thin, this group also includes places such as **Columbus, OH**, and **St. Louis, MO**, that score just below the national average for advanced industry employment but lack any distinctive concentration.

At the same time, 14 major metropolitan areas combine disproportionate strength in both advanced manufacturing and advanced services. Among these balanced hubs of activity, **San Jose; Detroit; Houston; Palm Bay, FL;** and **Seattle** house the largest overall concentrations of advanced industry employment. San Jose specializes in 17 different advanced industries—including five services—ranging from computer systems design and research and development to semiconductor

### Each major metropolitan area has its own constellation of advanced industry activity but falls into one of four general types



and computer equipment manufacturing.<sup>52</sup> Aerospace manufacturing and software publishing together compose one-half of **Seattle's** advanced industry workforce. **Detroit** retains its automotive manufacturing prowess but also specializes in engineering services, which accounts for 21 percent of its advanced industry workforce. Computer systems design, management consulting, R&D services, and data processing, meanwhile, employ another one-fourth of **Detroit's** advanced industry workforce. In **Houston**, employment in architecture and engineering services outweighs even the oil and gas industry, although the former often supplies the latter. Audio and video equipment manufacturing, semiconductor manufacturing, computer systems design, and engineering services anchor **Palm Bay's** diversified advanced industry base.

### ADVANCED INDUSTRIES ARE UNEVENLY CONCENTRATED ACROSS STATES

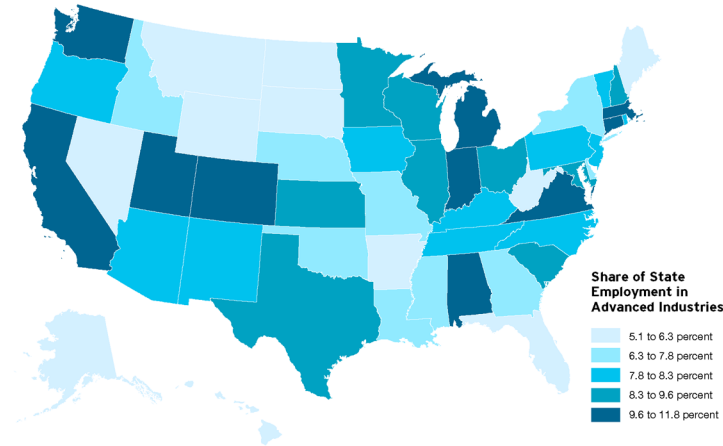
Advanced industry employment is ubiquitous but varies considerably in its density across U.S. states and regions. Not surprisingly, **California**, **Texas**, and **New York** had the largest number of advanced industry jobs in 2013, followed by **Illinois** and **Michigan**. Together these five states encompassed 35 percent of all advanced industry jobs in the United States, with both **California** and **Texas** containing more than one million each.

By region, the South leads with 4.3 million positions, followed by 3.0 million in the West, and 2.9 and 2.1 million respectively in the Midwest and the Northeast.

In **Michigan**, advanced industries accounted for 11.8 percent of all state jobs in 2013, more than anywhere else. The sector employed at least 10 percent of the workforce in six other states: **California**, **Indiana**, **Massachusetts**, **Utah**, **Virginia**, and **Washington**. At the other end of the spectrum, advanced industries accounted for fewer than 6 percent of all jobs in nine states, with the lowest shares in **Hawaii**, **Maine**, **Montana**, and **Nevada**.

**Michigan's** advanced industry base is highly specialized in automotive-related manufacturing. **Washington**, for its part, is highly specialized in aerospace products and parts manufacturing and software publishing, while **Massachusetts** specializes in scientific R&D services and navigation, precision, and analytic instrument manufacturing.

#### Dense concentrations of advanced industry activity can be found in every region of the country



Across the country, the geography of advanced industries—notwithstanding its broad-ranging diversity—has narrowed from what was once a more widely spread enterprise of regional prosperity. In 1980, 59 of the country's 100 largest metropolitan areas had at least 10 percent of their workforce in advanced industries. By 2013, only 23 major metropolitan areas contained such sizable concentrations of advanced industry activity. As a result, the U.S. economy is more reliant on a smaller number of advanced industry clusters today than at any point in recent history.

This erosion is a story of both absolute and relative (compared to other sectors) decline in advanced industry employment. From 1980 to 2013, total advanced industry employment fell in 164 of the country's 381 metropolitan areas. The other metropolitan areas saw stable or growing—in some cases significantly—employment in advanced industries.

Among large metropolitan areas, 39 added 10,000 or more advanced industry jobs from 1980 to 2013. **Washington, DC**, experienced the largest increase, gaining 353,000 advanced industry jobs, on net, over the period, followed by **San Francisco, Seattle, Atlanta**, and **Houston**. In percentage terms, the fastest growth occurred in **Austin**; **Boise, ID**; **Provo, UT**; **Las Vegas**; and **Cape Coral, FL**, with each seeing the number of advanced industry workers at least triple, albeit in some cases from low bases.

Conversely, 24 major metropolitan areas lost 10,000 or more advanced industry jobs, with the largest absolute losses occurring in **Los Angeles, New York, Chicago, Cleveland**, and **Rochester, NY**. In percentage terms, **Youngstown, OH**; **Springfield, MA**; **Rochester, NY**; **Scranton, PA**; and **Providence, RI**, saw the sharpest declines.

Metropolitan areas with increasing employment in advanced industries between 1980 and 2013 share a number of characteristics. Faster growing areas were more likely to be in the South or West. In 1980, they tended to have higher rates of bachelor's degree attainment in the population, more patents developed by local inventors, and a larger number of leading university research programs in the sciences. These factors may in part explain the large geographic shifts in advanced industry employment during the study period, though this analysis cannot identify whether any of these variables were causes of growing advanced industry employment concentrations or mere correlations.<sup>53</sup>

## The United States is losing ground to other countries in advanced industry competitiveness and now runs a large trade deficit even in some advanced services

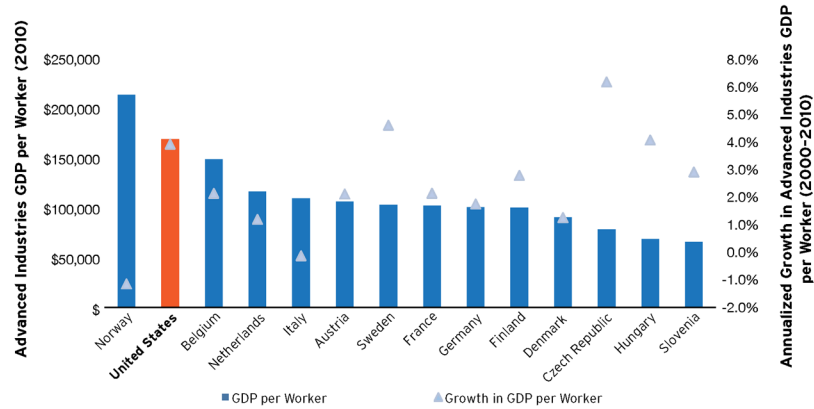
Among the 14 countries with comparable employment and production data in 2010, the most recent year available from the OECD, the **United States** had the second-most productive advanced industries sector in the world, behind only energy-intensive **Norway**. The average American advanced industry worker was about 2.5 times more productive than workers in **Hungary** and between 50 and 70 percent more productive than advanced industry workers in **Italy, Sweden**, and **Germany**.

This American productivity advantage appears to be holding up rather well. Among these 14 countries, only three saw faster growth in GDP per worker than the United States: the **Czech Republic, Hungary**, and **Sweden**.<sup>54</sup>

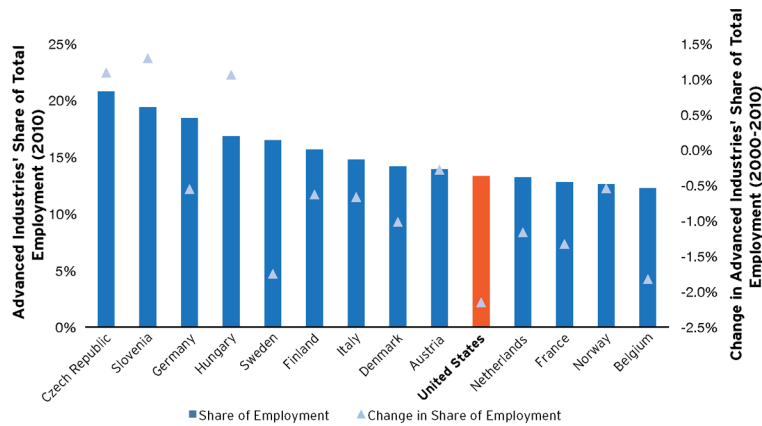
Despite this strength, however, the United States is losing ground on two other important measures of advanced industry competitiveness: the size of the sector by employment and its output as a share of the total U.S. economy. These measures show the U.S. economy pivoting away from advanced industry pursuits more sharply than competitor nations.

The **United States** saw the share of its jobs in advanced industries decline from 2000 to 2010 by more than any of the other 14 countries. To be sure, advanced industry employment fell in several other countries, but the declines were much more

**The U.S. advanced industries sector sustains fast productivity growth even with output per worker that is already well above average**



**U.S. employment in advanced industries is low by international standards and falling rapidly**



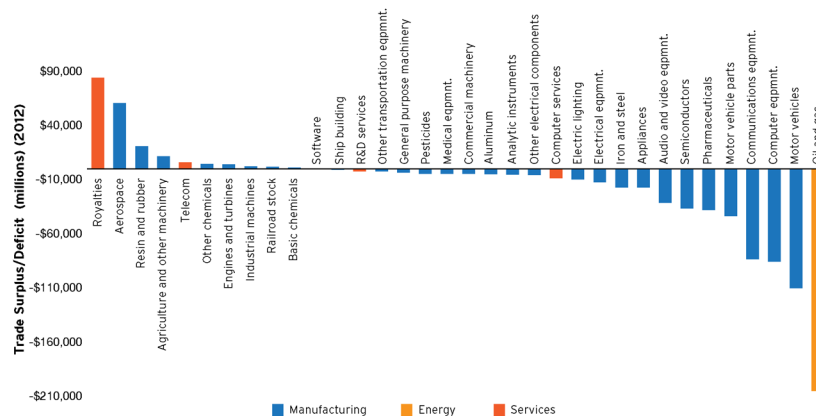
modest than the 2.2 percentage point loss in the United States. **Austria, Germany, Norway, Finland, and Italy**, for example, saw the share of total employment in advanced industries fall by less than 1 percentage point during the 2000s. Advanced industry employment shares increased in lower-income OECD countries such as **Slovenia**, the **Czech Republic**, and **Hungary**. By 2010, nine of the 14 countries were more specialized in advanced industries than the United States.

Output trends depict a similar slippage. Because of increasing productivity, the share of U.S. GDP in advanced industries did not fall as quickly as employment from 2000 to 2010, according to OECD data, which define the sector more broadly. Nonetheless, the contribution of advanced industries to U.S. GDP declined by 2 percentage points, putting the **United States** in the middle of the 15 countries for which output data are available. Advanced industries in **Austria, Germany, Finland, Sweden**, and the **Czech Republic** all generated a larger share of their countries' GDP in 2010 than in 2000. Overall, the 2010 data suggest that the United States derives a smaller share of its national output from advanced industries than six of the 15 OECD countries, including **South Korea, Germany, and Sweden**.

This gradual erosion of U.S. competitiveness is playing out starkly in terms of global trade, where advanced industries are crucial. Advanced industries export \$1.1 trillion worth of goods and services and account for 59 percent of total U.S. exports. However, the United States ran a \$632 billion trade deficit in advanced industries in 2012, in line with typical yearly balances since 1999. Most of that deficit can be attributed to goods. The United States imports roughly \$1.6 trillion in advanced industry products but exports just \$0.9 trillion. The United States does carry a comparatively small but positive trade balance in advanced services, exporting \$230 billion and importing \$131 billion worth.

To be sure, the United States exports more than it imports in a number of individual advanced industries. Royalties provide a net \$84 billion to the trade balance, for example, and advanced industries all together account for some two-thirds of U.S. export earnings from intellectual property.<sup>56</sup> Other major net exporters include aerospace manufacturing, which runs a \$61 billion trade surplus; resin and synthetic rubber and fiber manufacturing, with a \$21 billion surplus; and agriculture and other

### With few exceptions, the United States runs a significant trade deficit in advanced industries



## ADVANCED INDUSTRY TRADE DEFICITS HAVE IMPORTANT IMPLICATIONS FOR THE U.S. ECONOMY

Many questions and debates surround the origins and significance of the trade deficit nationally, but it is easier to parse the meaning of deficits within individual advanced industries. Deficits can symbolize lagging competitiveness or they can stem from the distortionary economic policies of competing nations.

With respect to competitiveness, trade deficits can result when foreign countries are simply better at producing the products consumers want at the prices they are willing to pay, on the one hand, or they may indicate that other countries offer companies more profitable locations for production, on the other. As such, trade deficits in advanced industries can point to two serious shortfalls, lagging innovation and lagging cost-competitiveness, each of which public policy can help ameliorate.

Trade deficits can and do also result from foreign government policies and practices that unfairly distort trade and which often disproportionately impact advanced industries. Among the blunter options, countries can manipulate the value of their currencies to make their exports cheaper while raising the cost of competing imports. More targeted mercantilist policies include the covert theft of intellectual property as well as compulsory technology sharing requirements. Export subsidies, state-backed financing, divergent technical standards, and other difficult-to-measure nontariff barriers further distort trade, especially in high-stakes advanced industries. All call for robust enforcement to be a pillar of U.S. trade policy and international economic strategy.

Regardless of their origins, advanced industry trade deficits pose a serious threat to the country's long-term prosperity. Because most innovation builds on existing technologies and is evolutionary in nature, the concentration of advanced industrial activity and know-how outside of the United States puts the nation's ability to own the next-generation of critical technologies into question. Reducing the trade deficit in advanced industries is essential to slow the erosion of U.S. innovative capacity.

Once competitiveness fundamentals are addressed and the rules of fair play in the international trading system enforced, advanced industries should themselves hold the key to balancing trade. Because the sector aligns closely with the United States' natural comparative advantage in high-skilled and capital-intensive industries, the sector represents the economy's best chance to increase exports and attract new investment into productive capital.

*Sources: Martin Baily and Barry Bosworth, "U.S. Manufacturing: Understanding Its Past and Its Potential Future" (Washington: Brookings Institution, 2014); Robert Atkinson, "Understanding and Maximizing America's Evolutionary Economy" (Washington: Information Technology and Innovation Foundation, 2014); G. Hatsopolous and others, "U.S. Competitiveness: Beyond the Trade Deficit," Science 15 (1988); Michelle Wein and others, "The Global Mercantilist Index" (Washington: Information Technology and Innovation Foundation, 2014).*

machinery manufacturing, with a \$12 billion surplus. Management consulting and architecture and engineering services generate the largest trade surpluses among advanced services industries. Software exports, for their part, are growing quickly but net only \$479 million.

The earnings from these trade surpluses, however, are dwarfed by the deficits in other parts of the advanced industries sector. Not surprisingly, oil and gas extraction has the largest trade deficit, which stood at \$205 billion in 2012 but has been declining steadily since 2011 thanks to increased domestic production. Perhaps more disconcerting are the trade deficits in such areas of purported strength as communications equipment, computer equipment, motor vehicles, and pharmaceuticals. Various trade barriers and currency manipulations surely play a role, but in any event the United States contends with trade deficits between \$30 billion and \$100 billion annually in nine key advanced industries.<sup>57</sup>

Nor can these deficits be entirely explained by trade barriers or cross-country differences in the cost of production alone. In addition to the deficits with relatively inexpensive, mercantilist locales such as **China**, U.S. advanced industry trades at a deficit with such open, high-cost countries as **Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Sweden, Switzerland**, and the **United Kingdom**.

As discomfiting as the trade deficit in advanced industry goods may be, the United States also runs a trade deficit in several very high value service industries where it is supposed to dominate. The United States imports \$8 billion more in computer design services than it exports, and \$2 billion more in scientific research and development services. Moreover, U.S. royalty payments to foreign intellectual property owners are growing faster than foreign payments to U.S. owners, suggesting that even that advantage may be eroding.

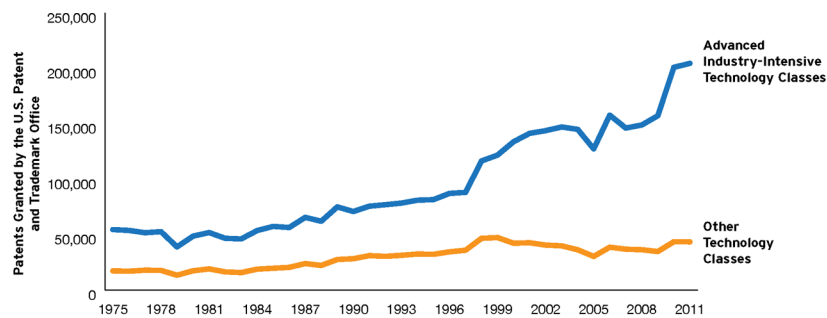
In sum, productivity, output, and trade data suggest that U.S. competitiveness in advanced industries is under threat.

### Advanced industries are the focal point of innovative activities such as R&D and patenting, but the U.S. advantage on these fronts is slipping

Innovation is the fundamental driver of economic growth, and advanced industries represent the very core of the nation's innovation enterprise. Advanced industries perform 90 percent of all private-sector R&D conducted in the United States. Advanced industries also dominate U.S. patenting, frequently the novel results from that R&D spending.<sup>58</sup> From 2007 to 2012, companies in advanced industries developed approximately 82 percent of all U.S. patents. Moreover, since the 1970s, the percentage of patents in technology classes associated with advanced industries has increased as a share of all patents. Patenting in advanced-industry-intensive classes now accounts for 85 percent of all U.S. patents, up from 76 percent in 1975.

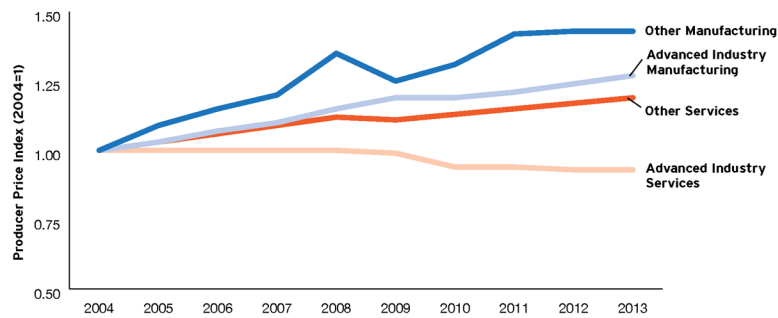
Patents in software technologies, in particular, have grown extraordinarily.<sup>59</sup> In the 1970s, software technology was confined to a small number of federally supported R&D centers, and computer programmers were essentially research scientists. That changed in subsequent decades with the increasing penetration of personal computers and the software required to run them. By 2012, software accounted for nearly one-fifth of all patents granted by the U.S. Patent and Trademark Office.<sup>60</sup>

#### Advanced industries have been responsible for an explosion in patenting during the past two decades



The explosion in innovation among advanced industries in recent decades and the continuing convergence of the physical and the digital realms have had profound effects on consumers and businesses. Prices of advanced industry goods and services have each fallen relative to prices of other products since 2004, as the prices of advanced industry goods increased 16 percentage points slower than other goods, and the prices of advanced industry services increased 26 percentage points slower than other services.<sup>61</sup> In fact, many advanced industry products were cheaper in 2013 than in 2004 for the same (or better) level of quality, a decisive testimonial to the relentless pace of technological progress in the sector.<sup>62</sup>

### Prices of advanced industry goods and services have fallen relative to the products of other sectors



Despite the sector's recent achievements, however, the United States is losing ground to other countries on measures of innovation performance and capacity.

The U.S. share of global patenting and R&D is falling much faster than its share of global GDP and population, meaning that U.S. slippage cannot be attributed to simply demography or macroeconomic convergence. From 1981 to 2011—the most recent year of available data—the U.S. share of world GDP fell 7 percentage points, even as it lost only 1 percentage point in its share of world population.<sup>63</sup> That fact represents strong progress in once desperately poor countries. More surprising, however, is the fact that the United States lost 12 percentage points in its share of global patenting and R&D spending.

Coincident with this trend, U.S. R&D imports have grown 18 percent annually from 2000 to 2012, twice as fast as its R&D export growth. The United States imports R&D services from many countries, including **China** and **India**, but most of the value—57 percent—comes from Europe. Ireland, which offers generous tax incentives for R&D, accounts for 17 percent of U.S. imports of R&D services, some of which comes from the subsidiaries of U.S.-owned companies. **Germany**, the **Netherlands**, **Switzerland**, the **United Kingdom**, and **Japan** are all high-cost countries with which the United States also runs a trade deficit in R&D services. The trend is clear: other countries are becoming relatively more attractive locations to conduct R&D.



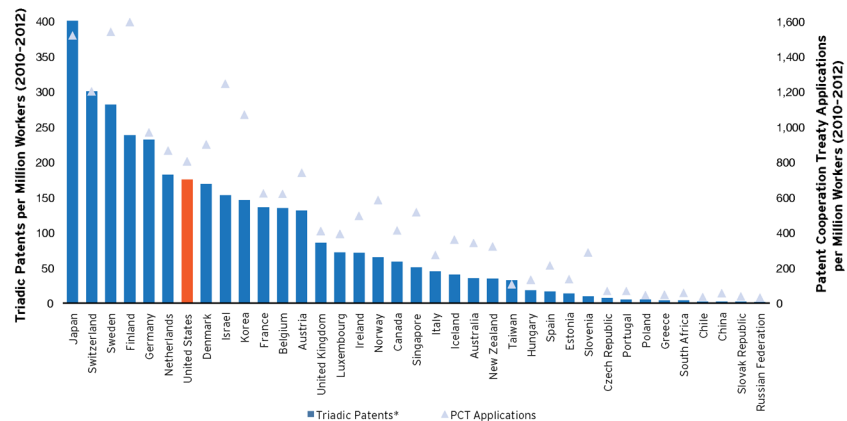
What is more, even as non-U.S. workers develop an increasing share of patented technologies, the United States ranks well below several other rich and middle-income countries in patents per worker. On two different measures of patents per worker that give weight to patent quality, the United States ranks seventh and tenth among its peers.<sup>64</sup> **Denmark, Germany, Finland, Japan, the Netherlands, Sweden, and Switzerland** all outperform the United States on both measures. These patenting outcomes are all the more surprising given that the United States ranks second on R&D expenditures per worker, behind only Finland.

Commentators on U.S. competitiveness, meanwhile, often take comfort in the strength of U.S. research universities.<sup>65</sup> And it's true that the most compelling measures of university research strength do point to the preeminence of individual U.S. research institutions.<sup>66</sup> Yet, the United States is a big country, and it no longer looks as dominant in research after adjusting for the size of its working-age population. Per capita, **Switzerland** is the global leader in highly cited scientific publications, and eight other countries globally outperform the **United States**.<sup>67</sup> The prolific output of country's top universities masks thinness lower in the ranks.

What is more, on certain key metrics only a handful of U.S. metropolitan areas rank among the world's most innovative regions. In terms of patent cooperation treaty applications per capita, for example, the vast majority of U.S. metropolitan areas fall well below their counterparts in Western Europe and Asia.<sup>68</sup> Among the nation's most patent-intensive regions, just two—**San Diego** and the **San Jose-San Francisco** combined area—rank in the global top 20, and just two more score in the top 50 (**Boston** and **Rochester, NY**). In fact, Germany, Switzerland, and Japan each have more metropolitan areas in the global top 50 than the United States. To put this in perspective, the average resident of **Stockholm**, a top 20 area, is over three times more likely to file a patent application than the average resident of the **New York City** metropolitan area, four times more likely than the average resident of **Pittsburgh**, and over five times more likely than the average resident of **Phoenix**.

In summary, advanced industries are the prime site of U.S. innovation, but their global dominance is undercut by the nation's slippage on crucial metrics of innovative capacity and output.

### The United States trails many of its key competitors on patent awards and applications per capita



### Eighteen of the world's 20 most patent-intensive regions are outside the United States

Region	Country	Patent Cooperation Treaty Applications per Million Residents
Basel-Stadt	Switzerland	726
East Württemberg	Germany	724
<b>San Diego-Carlsbad-San Marcos, CA</b>	<b>United States</b>	<b>665</b>
Tokyo	Japan	647
Stuttgart	Germany	603
Pirkanmaa	Finland	597
Nuremberg	Germany	567
Daejeon	Korea	566
Regensburg	Germany	560
Cambridgeshire	United Kingdom	558
<b>San Jose-San Francisco-Oakland, CA</b>	<b>United States</b>	<b>543</b>
North Brabant	Netherlands	524
Uusimaa	Finland	503
Munich	Germany	500
Stockholm	Sweden	490
Vaud	Switzerland	488
Uppsala	Sweden	483
Rhine Valley-Lake Constance	Austria	460
Ibaraki	Japan	436
Vastmanland	Sweden	431

Source: Brookings analysis of OECD statistics at territorial level 3 aggregations, roughly corresponding to metropolitan regions

### Jobs in advanced industries are available at all levels of education, but the education and training pipeline that channels workers into the sector is narrow

By definition, an outsized share of workers in advanced industries are in STEM occupations. Just over half, or 53 percent, of all advanced industry employees work in occupations that demand extraordinary STEM knowledge in one or more fields. That compares with 17 percent outside the sector.

The occupations over-represented in advanced industries fall into five groups: architecture and engineering; computer and mathematical science; life, physical, and social science; production; and business and financial operations. The average U.S. worker in these groups is two to eight times more likely to be employed in an advanced industry than in other industries. Advanced industries employ 79 percent of all U.S. architecture and engineering workers, for example, and more than one-half of all workers in computer and mathematical occupations and life, physical, and social science occupations in the economy. In this sense, advanced industries are a critical storehouse of the nation's STEM knowledge base.

In general, advanced industry workers have attained substantially higher levels of education than those in other industries. Forty-four percent hold at least a bachelor's degree, compared with 32 percent of workers outside the sector. Individuals with a Ph.D. are 1.8 times more likely to work in an advanced industry than not, even though the education industry itself falls outside the sector. Those with a master's degree are 1.6 times as likely to work in an advanced industry.

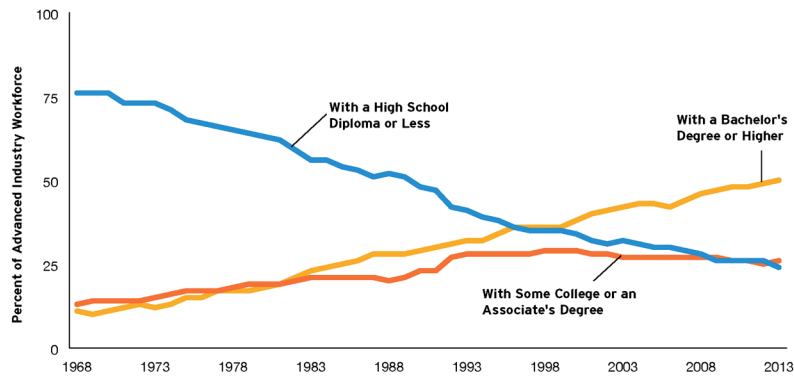
### The advanced industries sector employs more than one-half of the country's science, engineering, computer, and mathematics workforce

Occupational Category	Advanced Industry Share of U.S. Total	Share of Advanced Industry Workers
Architecture and Engineering Occupations	79%	13.1%
Computer and Mathematical Occupations	58%	14.8%
Life, Physical, and Social Science Occupations	54%	3.9%
Production Occupations	33%	21.2%
Business and Financial Operations Occupations	21%	9.0%
Management Occupations	19%	8.6%
Arts, Design, Entertainment, Sports, and Media Occupations	10%	1.4%
Installation, Maintenance, and Repair Occupations	9%	3.4%
Office and Administrative Support Occupations	8%	12.2%
Construction and Extraction Occupations	4%	1.5%

Source: Brookings analysis of OECD statistics at territorial level 3 aggregations, roughly corresponding to metropolitan regions

That said, the majority of advanced industry workers do not hold a bachelor's degree. Nine percent of advanced industry workers have an associate's degree, but another 47 percent possess no college degree at all. That group includes the 21 percent of advanced industry workers who have attended some college and perhaps obtained a certification but hold no degree. Advanced industry jobs are available at all education levels and hold out significant opportunity to lower- and middle-skill Americans.

### Declining employment in advanced industries has come at the expense of the least, but not the middle, skilled



Thanks to globalization and steady technological change, however, the education requirements of the advanced industries sector are rising, creating a significant skills challenge. In 1968, the first year for which data are available, 76 percent of advanced industry workers had never attended college. As late as 1980 that share stood at 63 percent. Since then, however, that share has plummeted to around 25 percent, which represents a loss of 4.5 million quality jobs for workers with a high school diploma or less. Since 1980, however, the number of advanced industry jobs for those with some college but less than a bachelor's degree has expanded by 1.3 million, although their share of the sector's workforce has plateaued since 1993. The sectors' steady upskilling, then, has come at the expense of those with the least education but rewarded those with both moderate and high amounts. Overall, the sector continues to offer considerable opportunity to those with even a modicum of postsecondary training in STEM fields.

### IS THERE A SKILLS GAP?

This report contends that the demand for STEM skills in the United States exceeds the supply, particularly in key areas such as computer science and engineering. Although this position is widely accepted, it still sparks disagreement.

First, some macroeconomists question whether a "skills gap" has in fact slowed the economy's recovery from the Great Recession. However, this is not the claim here. As in typical recessions, the demand for labor fell, and as it did, job vacancies became much easier to fill. Thus, poor macroeconomic performance largely coincided with an easing of the STEM shortage. Since then, demand has recovered and the skills shortage has worsened.

Others skeptics point to the limited number of job openings with stable funding for academic scientists at research universities or that most production occupations at manufacturing companies are readily filled and do not require high levels of skill. These points have merit, but they overlook the high demand for STEM skills in the much larger private sector, in the first case, and for skilled blue-collar and professional STEM occupations, in the second case, particularly in advanced industries.

As it happens, there is a deeper element to the skills gap that is not directly affected by macroeconomic cycles nor limited to a segment of the labor market. In 2013, people working in STEM occupations earned 42 percent more than those in other occupations, controlling for education, experience, and sex. This premium was just 19 percent in 1980, suggesting that growth in the demand for STEM skills has outpaced growth in the supply over the long run. Against this historic context, recent evidence points in the same direction: STEM vacancies take longer for employers to fill, real and relative wages have been growing, and unemployment rates are low. These skills gap signals are clearest for STEM professionals (such as computer workers, health care professionals, engineers, and scientists), but slightly less severe for skilled blue-collar STEM jobs (such as repair technicians, plumbers, machine programmers), and not at all evident for less skilled blue-collar jobs.

*Sources: Jonathan Rothwell, "Education, Job Openings, and Unemployment in Metropolitan America" (Washington: Brookings Institution, 2012); Michael Teitelbaum, Falling Behind? Boom, Bust, and the Global Race for Scientific Talent (Princeton: Princeton University Press, 2014); Paul Osterman and Andrew Weaver, "Why Claims of Skill Shortages in Manufacturing are Overblown." Issue brief no. 376 (Washington: Economic Policy Institute, 2014)*

Despite these trends, many advanced industry employers report difficulties finding qualified workers, which places a drag on advanced industry competitiveness. A key factor in these difficulties appears to be the sector's heavy reliance on relatively scarce STEM skills. Sixty percent of all job postings in advanced industries are for STEM workers, compared with 34 percent outside of advanced industries.<sup>69</sup>

In any event, the typical posting for an advanced industry STEM vacancy remains online for an average of 43 days compared with 32 days for a non-STEM advanced industry ad. In the economy overall, ads are posted for an average of 35 days—a

### Difficulties filling critical positions in advanced industries act as a brake on economic growth

Difficult-to-fill Positions	Average Duration in Days of Job Postings in Advanced Industry Companies
Computer and Mathematical Occupations	46
Management Occupations	45
Architecture and Engineering Occupations	44
Business and Financial Operations Occupations	36
Sales and Related Occupations	37
Office and Administrative Support Occupations	27
Life, Physical, and Social Science Occupations	39
Installation, Maintenance, and Repair Occupations	37
Production Occupations	33
Healthcare Practitioners and Technical Occupations	32
Source: Brookings analysis of Burning Glass data	

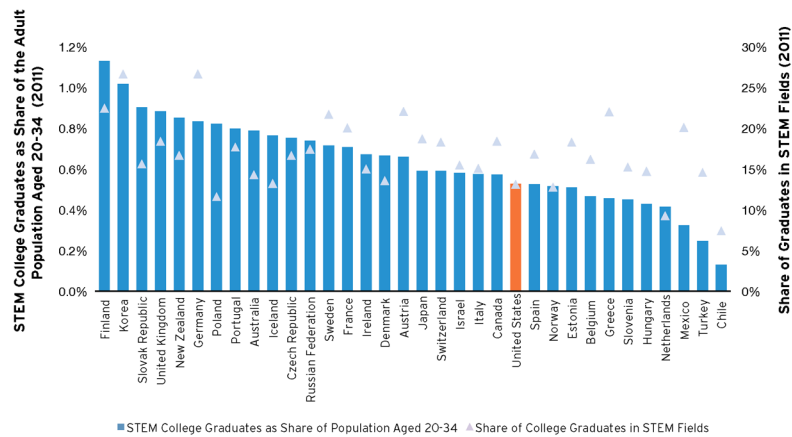
timespan driven up by continuously advertised positions in low-skilled and high-turnover jobs. Among advanced industry vacancies unfilled for at least 60 days, computer and mathematic positions are the hardest to fill. These jobs include software developers and computer systems analysts. Across the United States, 17,000 computer-related ads posted in the first quarter of 2013 lingered for at least 60 days on company websites, signaling if not a structural shortfall in supply relative to demand, then a serious matching problem.

A number of other positions outside of computer occupations also go unfilled for long periods in advanced industries. These positions include architecture and engineering jobs, whose postings in advanced industries last for 47 days, on average. Advanced industry managerial positions are open for 43 days, on average. Job openings for installation, maintenance, and repair workers in advanced industries last 41 days, on average, and 47 days for ones that demand high levels of STEM knowledge.

These vacancy data, at any rate, suggest that many advanced industry companies are having difficulty finding workers with the needed STEM skills, a problem that undercuts U.S. competitiveness as a location for advanced industry production. At the problem's core lies the fact that the U.S. education system does not graduate enough college students in STEM fields, nor does it adequately prepare children to attain fluency in mathematical and scientific concepts. U.S. youths and adults alike perform much more poorly on OECD exams of math and science competencies than many of their peers in developed countries.<sup>70</sup> Moreover, even students in the top 10 percent of U.S. performers score well below their highest-scoring peers in other developed countries.

This subpar academic performance in middle school and adulthood corresponds with low STEM graduation rates at the postsecondary level. Measured in two ways—annual STEM graduates per capita and the share of total graduates completing degrees in STEM fields—the **United States** lags far behind other developed countries.<sup>71</sup> In terms of annual STEM graduates per person aged 20 to 34, the **United States** ranks 23rd among developed nations.<sup>72</sup> No fewer than eight countries—**Finland**, **Korea**, the **Slovak Republic**, the **United Kingdom**, **New Zealand**, **Germany**, **Portugal**, and **Poland**—graduate STEM students at a rate at least 50 percent higher than **United States**. Similarly, the **United States** ranks a distant 32nd in terms of the percentage of its graduates majoring in STEM fields, with just 13 percent of graduates choosing majors in science, computer science, or engineering. In **Korea** and **Germany**, 27 percent of college graduates choose these fields, and in countries as diverse as **Greece**, **Mexico**, and **France**, at least 20 percent of all graduates leave university with a STEM degree. Increasingly, the **United States** lacks the skills base to sustain advanced industry competitiveness.

### The United States lags behind most competitors and peers in graduating a STEM workforce



### Only 15 large U.S. metropolitan areas are home to more STEM graduates as a share of the young adult population than Finland, the global leader

Metro Area	STEM Share of Total Graduates	STEM Graduates per Person Aged 20-34
Madison, WI	26%	2.5%
Albany-Schenectady-Troy, NY	18%	1.9%
Springfield, MA	15%	1.8%
Rochester, NY	24%	1.7%
Raleigh, NC	36%	1.6%
Syracuse, NY	18%	1.6%
Provo-Orem, UT	19%	1.5%
Pittsburgh, PA	21%	1.3%
Boston-Cambridge-Newton, MA-NH	15%	1.3%
Greenville-Anderson-Mauldin, SC	23%	1.2%
San Jose-Sunnyvale-Santa Clara, CA	29%	1.2%
Worcester, MA-CT	22%	1.2%
Dayton, OH	23%	1.2%
Akron, OH	14%	1.2%
Hartford-West Hartford-East Hartford, CT	17%	1.1%
<b>Finland Average</b>	<b>22%</b>	<b>1.1%</b>
<b>U.S. Average</b>	<b>15%</b>	<b>0.7%</b>

Source: Brookings analysis of Burning Glass data

Complicating the sector's human capital challenges are sharp regional variations in the availability of skills. These variations underscore that the nation does not possess a single national labor market but instead hundreds of local ones.

In this regard, the regional underpinnings of advanced industry competitiveness are characterized by stark contrasts. For example, at the high end of the distribution, certain U.S. metropolitan areas have amassed critical STEM skills at a rate consistent with international leaders. For instance, the number of STEM graduates as a share of the youth population (aged 20 to 34) exceeds the top international mark set by Finland in 15 of the largest 100 U.S. metropolitan areas by population. These "skills poles" include some of the most successful of the nation's advanced industry hubs, including **Boston, San Jose, Raleigh, and Provo**. Indeed, a strong correlation exists between STEM graduation rates and the share of total metropolitan employment in advanced industries. At the other end of the spectrum, 33 large U.S. metropolitan areas have STEM graduation rates that trail Spain's (which ranks 24th). These lagging metropolitan areas include prominent places such as **Phoenix, Las Vegas, Miami, Dallas, Detroit, Houston, and Kansas City**. This variation in the availability of human capital across regions creates a serious drag on the ability of many metropolitan areas to support advanced industries.

\* \* \*

Together, these findings confirm both the importance of the advanced industries sector to American vitality and the sector's considerable strength. At the same time, the findings suggest that the sector's global competitiveness may be slipping. Together, these conclusions point to the need for the nation, its firms, and its regions to recommit to innovation, strengthen STEM education and workforce training, and deepen the nation's regional advanced industry clusters. ■

**"The U.S. economy is more reliant on a smaller number of advanced industry clusters today than at any point in recent history."**



## V. IMPLICATIONS: STRATEGIES FOR PROMOTING U.S. ADVANCED INDUSTRIES

In describing the contours of the U.S. advanced industries sector, this report points to significant opportunity—but also challenges. On the positive side, the analysis demonstrates that the combination of intensive technology investment and highly skilled STEM workers in the advanced industries sector represents a potent source of U.S. prosperity. Advanced industries power the national economy, and their success is a prerequisite for building an opportunity economy in the United States.

Moreover, the report identifies a distinct advanced industry geography, with varied combinations of industries clustering in various regions to avail themselves of key innovation infrastructure, skilled workers, and supplier networks. In this respect, America's advanced industries are not national. They are local, and in metropolitan areas such as Austin, Boston, San Diego, Seattle, and Silicon Valley, they are world-class hubs of prosperity.

With that said, too many U.S. advanced industries and local advanced industry clusters are ceding global leadership.

The deterioration of the nation's balance of trade in advanced technology products during the last decade raises sobering questions about the long-term vitality of the sector in this country. Likewise, too few regional advanced industry ecosystems now retain the technology inputs, labor pools, and supplier density to generate the synergies that drive global competitiveness. Making matters worse, the gridlock in Washington continues to preclude national action to strengthen the nation's advanced industries.

All of which means private- and public-sector leaders—particularly those working in America's states and regions—need to engage. Already, numerous state and regional partnerships are working to expand America's advanced industries, often by attending to the fundamental needs to ensure these industries' long-term growth.



Yet more can and should be done. Specifically, the nation's private and public sectors should together:

- **COMMIT TO INNOVATION.** Competitiveness will increasingly depend on the development and diffusion of game-changing innovations. With “disruption” in the air, firms and policymakers need to redouble efforts to reignite innovation in the sector
- **RECHARGE THE STEM TALENT PIPELINE.** Technological change has thrown the recruitment of appropriately trained high- and middle-skilled STEM workers into flux. Companies and policymakers will need to collaborate to train the right workers in the right numbers
- **EMBRACE THE ECOSYSTEM.** Loaded with knowledge-spillovers, supply-chain assets, partnership opportunities, and key institutions and forums, regions are critical platforms for advanced industry competitiveness. Firms and policymakers should work together to strengthen regional industry clusters and optimize connections across the platform

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Of course, a wide variety of strategies reaching beyond those focused on innovation, skills, and industry ecosystems will be necessary to defend and extend advanced industries' competitiveness in the coming decade.

Companies will need to engage in broad “future-proofing.” Given that the advanced industries sector is essentially defined by disruptive technology trends, business-as-usual will be less and less tenable. Therefore, firms in the sector will need to constantly rethink what they do and how they do it.<sup>73</sup> Companies will need to **harness new digital formats** ranging from cloud computing, “Internet of Things,” and deep analytics to develop new levels of situational awareness about their markets, supply chains, consumers, and the world around them. They will also need to **become nimble collaborators** to secure the technology, suppliers, and markets they need, particularly when it comes to the software and IT applications that are reinventing every business. In these ways advanced industry firms can build new operational capacities and become what a recent survey of executives called “disruption ready.”<sup>74</sup>

For their part, governments, working with networks of business and civic partners, must do their part to provide the world's best environment for advanced industry growth at a time of increased global competition.

At the federal level, an advanced industries growth agenda should focus intently on delivering the world's most competitive array of tax, trade, finance, and infrastructure policies.<sup>75</sup> This does not mean simply cutting taxes or embracing free trade or practicing heavy-handed “industrial policy.” Rather, what is needed is a new set of smart, catalytic stances by government that facilitate a sustained public-private partnership to spur advanced industry growth. On taxes, Congress must **get serious about corporate tax reform** that simplifies the tax code, reduces the nation's high topline corporate tax rate, and bolsters and makes permanent the research and experimentation tax credit.<sup>76</sup> On trade, the government must simultaneously **pursue trade liberalization and trade enforcement.**<sup>77</sup> The United States should seek not only multilateral trade agreements but also true market openings and regulatory harmonizations that reduce both tariff and nontariff barriers that advanced industry exporters face in foreign markets.<sup>78</sup> Countries that engage in unfair trade practices should be held accountable.

Beyond taxes and trade, policymakers should consider how to **ensure access to “patient capital”**—capital that recognizes the time needed for young and small advanced industry firms to take innovative new products into large-scale production.<sup>79</sup> For that matter, the nation must become more urgent and strategic about ensuring that the public, private, and civic sectors engage together to **ensure the swift movement of people, goods, services, water, and energy** along reliable national and globally connected infrastructure networks.<sup>80</sup>

At the same time, state and local governments must also work to provide an optimal environment for advanced industry development. To do this, it will be important that states and metropolitan areas work with industry to **develop systematic competitive strategies** for organizing action to advance their regions' top advanced industry clusters.<sup>81</sup> Data-driven cluster assessments can provide an invaluable framework for targeting government efforts where they are needed and knowing where they are not.

More specifically, a state strategy can provide a valuable context for a number of initiatives that parallel needed federal efforts. As with their federal counterparts, state and local policymakers should work to improve the value proposition they offer to advanced industry firms and **optimize their tax environments to encourage innovation and capital investment**.<sup>82</sup> Likewise, state and local leaders should also partner with regional firms, economic development leaders, and others to **combine export promotion and foreign investment outreach** into an integrated global engagement strategy.<sup>83</sup> As with their federal colleagues, state and metropolitan actors must go further and **attend to the capital needs of small- and medium-sized enterprises** (SMEs) in the advanced industries sector. Aware that patient capital frequently eludes even the most promising advanced industry SMEs, states and localities have already started moving in this direction.<sup>84</sup> Last, states and metropolitan areas must **clear away the many local pinch points** that impede flows along the nation's road, rail, air, port, pipeline, and grid system.<sup>85</sup>

Notwithstanding their importance, moves like these are not enough. Neither steps by firms to improve their operations nor moves by government to improve the environment for advanced industry growth will alone ensure the competitiveness of the advanced industries sector. Given the trends depicted in this report, a more concentrated focus on the three deeper dimensions of advanced industry competitiveness—innovation, talent, and ecosystem development—is imperative.

## Commit to Innovation

Innovation remains the only lasting source of advantage both for high-value firms and high-wage locations.<sup>86</sup> As a result, the competitiveness of the advanced industries sector will depend heavily on how effectively its firms continue to innovate.

Yet the global climate for innovation is changing. New international competitors are mounting strong challenges to U.S. leadership. Further complicating matters, technology development no longer proceeds along a linear process from basic research to applied and development research in a few highly specialized fields or inside a discrete set of laboratory silos run by large corporations, universities, or the federal government.<sup>87</sup>

In short, the speed and complexity of innovation and its global champions are ratcheting up the urgency of the enterprise and demanding new strategies for engaging in it.

Both the private and public sectors must radically rethink their technology development strategies accordingly if they are to remain relevant. Lead actors in firms and government will need to both increase the scale of their innovation efforts and reconsider the formats they use to conduct it.

### *Strategies for the Private Sector*

During the recent recession, many advanced industry firms survived by virtue of mergers and acquisitions, stock buybacks, and austerity plans.<sup>88</sup> Now that the economy has begun to recover, firms should concentrate on innovation as their primary tool for creating value, whether to deliver unique capabilities, process and price savings, or new product offerings.

The most concrete way firms can strengthen their position in the global innovation economy is by **expanding corporate R&D and technology equipment portfolios**. Many U.S. advanced industry companies are superbly positioned to own the development of next-generation technologies, provided they stay ahead of technological change and global competitors.<sup>89</sup> During the last decade, however, the growth of private-sector R&D in the United States has lagged that in Denmark, Finland, Japan, and South Korea, to name a few advanced, global competitors. Moreover, the United States is the only OECD country in which private-sector R&D investment has shifted away from basic and applied research and toward development research.<sup>90</sup> Without a balance between basic research and applied development, the U.S. private sector runs the risk of falling behind technologically in the medium and long run. Moreover, evidence shows that many firms lag in their pursuit of innovation-focused investment opportunities. Research from McKinsey & Co. finds that a majority of U.S. firms are “sleepwalking” through R&D investment decisions, maintaining risk-averse, legacy R&D portfolios.<sup>91</sup> Support for the physical infrastructure—capital equipment, lab space, and the like—to sustain innovation has also fallen off.<sup>92</sup> In view of that, advanced industry firms must ask themselves whether they are conducting adequate and appropriate R&D, particularly in such general purpose technology areas such as IT, robotics, or materials. Neither “sleepwalking” nor free-riding on public-sector investments will suffice.

However, simply investing more in R&D by itself will not solve the problem. Given the rapid pace of technological innovation, no company can know everything it needs to know on its own. Consequently, advanced industry firms must experiment with new models for engaging in technological development that draw on networks of collaborators. Specifically, firms must **complement internal R&D initiatives with new open or networked innovation models**.<sup>93</sup> Through such models, successful companies are increasingly partnering with a wide variety of academic institutions, national labs, competitors, customers, venture-capital funds, and entrepreneurs to address both large and small innovation issues. Recent McKinsey & Co. work suggests these distributed or “open” approaches allow advanced industry firms to respond to the innovation imperative “faster and at lower cost and lower risk.”<sup>94</sup> The move toward open innovation may well be the key to enhanced return on investment for advanced firms. Open approaches to innovation may also be the best way to tackle cross-industry “platform” issues—those issues that are too large for any one firm to solve alone, such as the commercialization of ultra-lightweight materials in manufacturing or energy storage in advanced batteries.

**“Both the private and public sectors must radically rethink their technology development strategies if they are to remain relevant.”**

Related to the more open approach to R&D is the need to attend to the technical capacity of the supply chain. Individual advanced industry firms are under extreme pressure to make sizable bets on future technologies. Yet for these gambles to be profitably adopted and diffused, technology strategies must be shared throughout the community of technical users and partners.<sup>95</sup> From carbon fiber automobile parts to e-commerce procurement systems, coordinating technology development within the supply chain cuts costs, reduces redundancies, and facilitates risk-sharing. Accordingly, larger firms in the advanced industries sector should aggressively incubate new technology and process improvement throughout the value chain. If the technical know-how among suppliers is lagging or fundamentally misaligned, investments in innovation will not translate into strong growth. At minimum, advanced industry firms should be more open about their technology investment strategies and work with key suppliers to align technology. As technological complexity increases, more large firms will need to embrace supplier development models such as Nissan's Supply Chain Initiative, a joint effort between the company and the University of Tennessee Center for Industrial Services to enhance quality and productivity throughout the value chain.<sup>96</sup>

### **BOLSTERING COLLABORATION IN THE INNOVATION COMMONS: VIRGINIA'S COMMONWEALTH CENTER FOR ADVANCED MANUFACTURING**

The Commonwealth Center for Advanced Manufacturing (CCAM) in Virginia represents a state-of-the-art example of an industry-led, university-executed collaboration to advance manufacturing techniques.

CCAM is a collaboration among the state's leading research universities—the University of Virginia, Virginia Tech, Old Dominion, and Virginia State University—and advanced industry companies worldwide, including Rolls-Royce, Siemens, and Airbus. As an applied research center, CCAM bridges the divide between fundamental research conducted at universities and commercial product development routinely performed by companies.

With a focus on advanced research in surface engineering, manufacturing systems, machining technologies, welding/joining/additive manufacturing, and composite materials, CCAM performs both generic research jointly developed by CCAM's member companies and directed research projects exclusive to individual member companies. In both cases, member companies guide the research agenda as a way to obtain production-ready solutions to some of their common technological challenges. In this fashion, CCAM's collaborative model enables its member companies to pool R&D efforts to increase efficiencies, lower research costs, and in the process spur technological innovation in multiple advanced industries.

CCAM's approach to intellectual property resonates strongly with member companies. Firms can fund directed research and own the research outright. CCAM holds the intellectual property for generic research but makes it available royalty-free with a nonexclusive worldwide license to member companies. Member companies thus share in and financially support research that provides mutual benefits across a spectrum of advanced manufacturing processes.

CCAM has made impressive progress since its inception in 2011, which was prompted by Rolls-Royce's decision to build a jet engine component plant in Prince George County. It has increased its industry membership from seven to 20 companies and completed 18 research projects—nine generic, eight directed, and one externally funded. CCAM's collaborative model has produced new processes and techniques that have been applied in aerospace, defense, transportation, consumer electronics, and other advanced industries.

Consortia such as CCAM are breaking the mold and showing how new technology dynamics are motivating companies and their partners to craft creative, new innovation platforms to stay ahead.

*Source: Commonwealth Center for Advanced Manufacturing website*

### **Strategies for the Public Sector**

Private innovation strategies are only part of an industry's technology system. Public-sector engagement—federal, state, and local—remains essential.

Representing 30 percent of all U.S. R&D expenditures and more than 70 percent of basic R&D, the federal government's R&D strategies will remain critical to advanced industry competitiveness in the next decade. Federal R&D, after all, plays a key role in supporting basic science—the first step in a long innovation chain. However, in the last decade and despite its importance to the U.S. economy, average federal R&D funding has fallen to below 1 percent of GDP for the first time since 1952, when data were first collected.<sup>97</sup>

For that reason, the federal government should **significantly expand the nation's research enterprise** in economically strategic areas. To begin, the government should recommit to doubling its investment in basic R&D—a goal adopted by both President Obama and former President G. W. Bush.<sup>98</sup> However, basic research is insufficient to support efforts by U.S. firms to commercialize novel technologies. Therefore, the nation's research pledge should extend to applied R&D. As a point of context, federal support for applied research as a percent of GDP was two times higher in 1964 than it was in 2013, and federal support for applied development was three times higher.<sup>99</sup> At a moment of rapid technological change and intense competition, such declines must be reversed. Moreover, this expansion of the federal research project should focus on cross-cutting technologies that have multiple applications for a number of advanced industries, whether advanced materials sciences, next-generation genomics, or machine intelligence. This reorientation will ensure that any new R&D push yields insights with maximum relevance.

More than just the scale and focus of federal research needs updating. The government also must update how federal R&D is conducted if it is to accelerate the domestic commercialization of innovation. Specifically, the government must **embrace and scale up new collaborative formats for delivering public-sector R&D** in ways that place federal investments closer to the marketplace, recognize the growing complexity of the innovation system, and improve the chances for commercialization at home. Along these lines, the government should invest in expanding a robust new model of collaborative, use-oriented research aimed at accelerating new product development in the advanced industries sector. For example, Congress should build on a number of recent experiments, such as the initial Energy Innovation Hubs and the establishment of the first five institutes of the National Network for Manufacturing Innovation (NNMI).<sup>100</sup> These experiments offer models for how the federal government might co-invest in creating more public-private consortia to solve industry-relevant problems. Similarly, tax policies such as a collaborative R&D tax credit would reward joint university-firm investments. Finally, given that the federal government funds nearly one-third of university-based technological research, it could allocate a portion of such funding to technology transfer—getting new technologies out of the lab and into firms. In doing so would galvanize university commercialization.

State and local governments and regional economic development organizations also have an important role to play in encouraging innovation in the advanced industries sector. Together, state and metropolitan area leaders are well positioned to encourage advanced industry innovation activities, given their proximity to local industry concentrations. To be sure, federal dollars will continue to fund the bulk of public R&D even at the state and local level. But plateauing federal investment and ideological gridlock mean that states and localities will play an increasingly important role in planning, funding, and facilitating innovation.

States and their regions should therefore work to **identify their regional innovation clusters** and then move to formulate **well-researched advanced industry innovation strategies or “business plans”** for accelerating technological development and commercialization across them. In recent years states as diverse as Colorado, Massachusetts, Nebraska, Nevada, and Tennessee as well as numerous metropolitan areas—including Louisville-Lexington, Memphis, Newark, and Phoenix—have pursued their own “bottom-up” strategies to foster greater innovation.<sup>101</sup> Other states and metropolitan areas should follow suit.

Growing numbers of states and regions are also working to **enlarge the local technology development enterprise** and maximize its commercial impact. States spend substantially more on traditional “smokestack-chasing” economic development strategies than technology-based economic development programs such as university technology transfer.<sup>102</sup> Shifting some portion of the resources and attention lavished on the latter to more innovation- and technology-based programming would go a long way toward building regional advanced industry specializations. Meanwhile, more cities should follow the examples of New York and Seattle in developing bold partnerships to attract and better leverage advanced industry-related research or anchor institutions to urban locations.<sup>103</sup>

At the same time, states should take steps to **maximize the commercial impact of innovative activity within their borders**. Many states are working to facilitate technology transfer from universities and federal laboratories, whether by creating tech-transfer offices, developing standardized technology licensing agreements, or providing innovation vouchers to help firms “buy” innovation services from available labs or universities.<sup>104</sup> Innovation vouchers are particularly supportive of small- and medium-sized enterprises that typically lack both the resources and technical capacity to develop strategic partnerships with labs and universities.<sup>105</sup> Likewise, numerous states and metropolitan areas are developing thoughtful accelerator programs that provide modest grants to support the commercialization of new technology.<sup>106</sup>

### INVESTING TO POWER ADVANCED INDUSTRIES: COLORADO’S ADVANCED INDUSTRY ACCELERATOR PROGRAM

**F**inance is critical to innovation and technology commercialization in advanced industries. Although these industries—particularly biotech, aerospace, and clean energy—have long driven Colorado’s economy, the sector’s expansion has been challenged by limited access to capital among new firms. To reduce this barrier, the state launched the Advanced Industries Accelerator (AIA) program in 2013. Today, a program originally focused on biotech has been revamped to operate as a competitive 10-year, \$15 million annual matching grant program to support innovation and new firm development across the state’s entire advanced industries ecosystem.

The program offers four types of grants to advanced industries companies and Colorado research institutions: to support 1) proof-of-concept research and development, 2) early-stage capital and business retention, 3) infrastructure, and 4) exports. The proof-of-concept grants enable companies and research institutions to prove new technologies or products, a prerequisite for commercialization. For its part, the early-stage matching grant helps small Colorado-based companies attract private investment. The goal of infrastructure grant is to help build a foundation for companies to thrive, while the export grant helps businesses that are either new to exporting or expanding into new export markets. In all cases, preference is given to collaborative projects and technologies that cut across advanced industries.

Since the program’s inception, Colorado has awarded \$8.3 million in proof-of-concept and early-stage capital grants. Consistently oversubscribed, the AIA program continues to enjoy strong bipartisan support from the state’s legislature and Governor Hickenlooper. The FY15 budget provides an additional \$5 million for the program from the state’s general fund.

In addition to the AIA grant program, in 2014 the state legislature also passed the Advanced Industries Angel Investor Tax Credit, which allows investors contributing at least \$10,000 in an advanced industry company to receive a tax credit equal to 25 percent of their investment, with a maximum credit of \$25,000. A complementary program to the AIA, the tax credit stimulates investment in startups with strong growth potential.

Together these initiatives show how one state is focusing its resources to foster early-stage and small firm innovation and entrepreneurship in and across the advanced industries sector.

*Source: Advance Colorado’s Advanced Industries Accelerator Programs website*

Finally, states and localities should **recognize the importance of young firms** to their metropolitan areas' innovative capacity. The growth of new firms remains an important way for advanced industries to keep pace with technology cycles and retain their edge. Most innovative firms develop their proprietary technologies in the phase before profits are earned, when access to markets and capital are most critical. This is particularly true for firms outside the consumer software and life sciences industries, which venture capital funds favor. State and metropolitan supply chain mapping and export promotion services can improve new firms' access to markets, while public investment funds or angel investment tax credits can help make capital available for young and growing technology firms.

## Develop the Skills Pipeline

More qualified workers with different skill sets are also critical to the future competitiveness of the advanced industries sector. The skills prerequisites of modern advanced industries have been changing faster than the country's ability to train the needed workers. The result, as this report shows, is that advanced industry firms often struggle to fill job openings at both the professional and middle-skill levels.

The stresses are now sharpening. Evidence suggests that the recession may have temporarily obscured a skills gap that has been growing for years. Now that the economy is heating up and firms are beginning to expand again, both private- and public-sector actors, often in partnership, must bear down on improving the availability of skilled advanced industry workers.<sup>109</sup>

### *Strategies for the Private Sector*

Companies, to start, should reinvigorate their efforts to develop the talent they need in both the short and long term. Relentless pressure to slash costs has discouraged many advanced industry firms from investing directly in strong workforce training practices.<sup>110</sup> Now, however, the demands of renewed growth amid persistent skills gaps necessitate a stronger focus on retention and internal training even as firms seek out new opportunities in recruiting talent.

Many opportunities exist for meeting at least part of firms' skills needs through improved management and training of current employees. Creating career pathways that help incumbent employees advance and grow remains an extremely efficient way to meet worker shortages. Companies should therefore **invest in strong talent management and retention strategies**. Novel management practices that motivate managers to identify talented employees, tailor incentive structures to retain these workers, and help them develop skills within the firm have been shown to lower attrition rates, reduce costs, and improve production flexibility.<sup>111</sup> Moreover, availability of low-cost online training in many skill areas reduces the costs of company-funded training.

However, firms will not be able to meet all of their human capital needs this way. Companies also need smarter recruitment and workforce development practices. One smart, near-term strategy is to **implement more flexible hiring standards**. Relaxing formal education requirements expands the pool of potential workers. Many new or small advanced industry businesses are beginning to eschew formal academic requirements in favor of raw skills and commitment. Instead of college degrees, these firms seek mastery of certain programming languages or technical skills, often as demonstrated through national certifications.<sup>112</sup> Larger companies, in contrast, often have more rigid standards, which may lead them to overlook talented workers.<sup>113</sup> Going forward, the rise of new certification systems as well as online learning platforms such as Udacity, Coursera, and Tree House will make it all the more likely that people without formal degrees will be able to acquire advanced programming expertise and other technical skills. All companies should take advantage of this shift in training options.

Over the medium term, meanwhile, firms will need to get much more involved in developing the skills pipeline. Such involvement will require greater engagement with a wider array of local and regional partners. Already companies are beginning to aggressively **expand recruitment efforts to include community colleges and career and technical education (CTE) programs**. Beyond that, advanced industry firms should **get more involved in modernizing their local workforce development systems**.<sup>14</sup> Not always have companies been precise about their needs and problem-solving. Working individually or with other companies, firms should develop strong industry-led, sector-oriented regional skills partnerships that bring together community colleges and universities, workforce investment boards, chambers of commerce, and industry associations to create a lasting infrastructure that helps workers obtain the skills that companies need.<sup>15</sup>

### SECURING THE TALENT PIPELINE: PACIFIC GAS & ELECTRIC'S POWERPATHWAY

The utility sector has long faced a looming shortage of appropriately trained workers but few utilities have been as proactive at getting ahead of the problem as Pacific Gas & Electric (PG&E). PG&E responded to the threat in 2008 with "PowerPathway," a partnership between the company, unions, local education and training providers, and the public workforce development system. The partnership is building a sustainable workforce pipeline not only for the company, but also for the entire sector. PG&E established a program larger than itself for two reasons. First, the company knows that it must be able to both find and retain talent, which requires a large pool of potential workers. Second, PG&E recognized that its success depends on the ability of its customers, suppliers, and business partners to find the talent they need too.

To those ends, PG&E works closely with community colleges throughout the state to design curriculum, train faculty and trainers, and co-deliver instruction. It also hosts field visits and donates equipment. Curricula developed in partnership with PG&E are not proprietary and focus on marketable skills for positions such as welders, power engineers, substation technicians, gas field service technicians, and energy efficiency and renewables technology installers. The company's hands-on involvement ensures that the training remains flexible and up-to-date.

The program has been a boon for students as well. Recruitment efforts target veterans and individuals from underprivileged communities. After only six to eight weeks of training, participants are employment-ready and can expect starting wages of \$25 per hour. To date, PowerPathway has trained more than 450 students since 2008 with a placement rate more than 80 percent.

*Sources: The Aspen Institute, "Skills for America's Future Models of Success: PG&E PowerPathway" (2013); National Commission on Energy Policy, "Report from the Task Force on America's Future Energy Jobs" (2014); Alex Brown, "How One Utility Giant Created Its Own Pipeline of Skilled Workers," National Journal (January 13, 2014); Association for Career and Technical Education, "Taking Business to School: Pacific Gas and Electric Company" (2013).*

Over the longer term, good corporate citizenship can align with self-interest in creating ambitious partnerships in education and training. In this respect, firms should **partner with local educational institutions to develop the next generation of skilled STEM workers**. To give just a few examples, in 2011, IBM partnered with the New York City school system to create P-TECH—Pathways in Technology Early College High School—an IT-oriented career and technical high school.<sup>16</sup> In North Carolina, Biowork, a consortium of bio-tech companies, has fostered successful partnerships with the state's community colleges, leading to high job placement rates for graduates.<sup>17</sup> In Manchester, NH, advanced industry technology firms Dyn and Silvertech have invested in a local high school to create STEAM-Ahead, which encourages high school students to obtain one year's worth of college credit in STEAM-oriented (STEM plus art) courses.<sup>18</sup> Such deep partnerships are also emerging to support training for sub-baccalaureate and professional STEM workers. For example, firms in the Minneapolis-St. Paul biomedical sector work closely with a local community college to create specialized programs for medical technicians.<sup>19</sup>



### **Strategies for the Public Sector**

The imperative for private-sector initiative and involvement notwithstanding, it remains the public sector that delivers most formal education and workforce training in the United States. And here, significant change is needed if the nation is to ensure the advanced industries sector has access to the workers it needs to thrive.

The federal government, which operates at a remove from front-line regional labor markets, can best support the development of a high-quality advanced industry workforce by focusing on the quality of publicly funded education and directly investing in STEM-oriented higher education.

On the first priority, the federal government has a role to play in improving the quality of P-12 basic education, the starting point for the nation's technical workforce. The federal government should leverage its modest P-12 funding role to **improve accountability and encourage innovation in education, particularly in schools that serve lower-income students**. The Bush administration's No Child Left Behind legislation introduced formal accountability to the system and the Obama administration's Race to the Top contest spurred innovation by rewarding states and districts that, among other things, encouraged the creation of equitably funded charter schools. Both of these initiatives have strengths and weaknesses that have been discussed at length elsewhere. However, lessons learned from these initiatives about what works in education should be applied when determining how and what the federal government funds in the future.

With regard to STEM education, the government should **increase investment in applied STEM education at all levels**. Federal investments play a significant role in strengthening the workforce pipeline.<sup>120</sup> Fourteen federal agencies, including the National Science Foundation, the National Institutes of Health, and the Department of Education, spend more than \$4 billion annually on graduate-level research grants and undergraduate fellowships.<sup>121</sup> In addition, many of these agencies fund professional development for STEM educators and STEM education programs from preschool through high school. Given the importance of STEM to national economic competitiveness, the federal government should maintain if not increase its level of support for such activities. At the same time, the federal government should shift the focus of its STEM investments. Currently, the bulk of federal STEM education spending supports bachelor's degree programs in science fields, with the goal of developing research professionals.<sup>122</sup> Although worthy, that focus means that relatively little funding flows to community colleges, for example, or middle-skilled training. As a result, the nation may be missing out on low-cost opportunities to enhance the skills and earning power of a large segment of the American workforce.

States and local actors, for their part, should take the lead in prioritizing and delivering high-quality workforce development and STEM education that is aligned with the needs of regions' core advanced industries. The lack of workforce development has in many regions reached a near crisis level, with serious shortages of workers in some middle- and high-skill occupational categories. Given this, states must **articulate and implement a strong vision of aligned advanced industry-related training and education**. As the National Governor's Association has noted, states are uniquely positioned to coordinate the hundreds of state, local, private, and philanthropic actors that deliver services in the education and training ecosystem.<sup>123</sup> Governors and other state leaders should therefore prominently highlight the need for skill-building that meets the needs of top advanced industries. They should also work to coordinate efforts related to education, training, and economic development, and launch strategies with measurable goals. Tennessee Governor Bill Haslam's "Drive to 55" initiative to ensure that 55 percent of Tennesseans earn an associate's degree or certificate by 2025 targets all of these priorities (see box).<sup>124</sup>

### **BUILDING AN ADVANCED INDUSTRIES WORKFORCE: TENNESSEE'S DRIVE TO 55 INITIATIVE**

**E**fforts by states and regions to strengthen their advanced industries frequently focus on efforts to better align education and workforce training systems to the needs of local industries.

In Tennessee, for example, a renewed interest in strengthening the state's auto industry and other advanced industries inspired Gov. Bill Haslam to rethink how the state prepares workers for well-paying jobs. He began in 2013 by appointing a special advisor to make postsecondary education and workforce training more accessible, affordable, and more closely aligned with firms' workforce projections. This special advisor worked with the governor and leaders from the state's postsecondary institutions to craft a new approach to workforce development that encouraged greater postsecondary educational attainment while also inviting industry leaders to play an active role in the design and implementation of workforce training.

That same year, the state embarked on its Drive to 55 initiative, which aims to ensure that 55 percent of Tennesseans have either a postsecondary degree or certificate by 2025. The initiative has three key programs. The first is Tennessee Promise, which provides two years of free attendance for Tennessee high school graduates at a state community colleges or college of applied technology (TCATs). Tennessee Reconnect, the second program, provides tuition-free certificate training at the state's TCATs. Finally, Tennessee Labor Education Alignment Program (LEAP) is a competitive grant program that supports regional collaboration among businesses and education providers to use data to identify and then address local skills gaps.

Taken together, the three Drive to 55 programs highlight the critical components needed for any successful workforce development program in advanced-industries: strong emphasis on postsecondary education (particularly at the sub-baccalaureate level) paired with clear incentives for industry involvement.

*Source: Office of the Governor of Tennessee, "Haslam Announces Higher Education Initiative: Corporate Leader to Spearhead Effort in Coordination with State Leadership" (Nashville: State of Tennessee, January 15, 2013) and Drive to 55 Alliance, "About the Alliance" (<http://driveto55.org/about/the-alliance/>).*

States should also **facilitate and support "bottom-up" efforts to align labor supply with demand regionally** throughout the workforce development and skills education system. Only through robust partnerships and open channels of communication can the public sector hope to respond to the rapidly changing needs of local advanced industry employers. States and governors are well positioned to spur needed regional partnerships, which should then be managed by local actors. A program pioneered in Washington State shows the catalytic power of a well-designed state initiative. There, the state created a competitive workforce challenge grant to fund regional workforce development solutions to address documented skills needs in local labor markets.<sup>125</sup> Maryland's EARN program adopts a similar approach by providing competitive grants for industry-led regional skills partnerships.<sup>126</sup> In both states, the programs created a competitive atmosphere within regions that inspired new public-private partnerships.<sup>127</sup> The approach also has the benefit of fostering experimentation and the diffusion of best practices.

Meanwhile, because regions and metropolitan areas reside on the front lines of the labor market, they should lead the practical work of aligning skills development with the needs of regional advanced industries. Local consortia of employers, workforce development providers, unions, and community colleges are best situated to identify, develop, and deliver responses to worker training issues in partnership with and with support from their states.

And yet, sustaining the long-term competitiveness of the advanced industries sector will require more than just near-term workforce training. It will also require increasing the STEM proficiency of many more American workers through the formal education system.

State-funded institutions of higher-education have the most urgent responsibility to meet the needs of employers, either by graduating new workers into the labor-force or re-training incumbent workers.

The first priority in this regard is to **attune educational curriculum to regional demand for STEM skills**. This tuning can take three forms. First, postsecondary institutions—in the business of supplying the degrees demanded by students—could do most of the alignment work themselves if states took steps to better inform students about how local career opportunities vary by field of study. Second, institutions and systems can take advantage of newly accessible labor market data and formal relationships with business organizations to align curriculum with local skills needs. Third, state and local governments can and should invest directly in STEM higher education through tuition support, capital improvements, and efforts to recruit and retain high-quality faculty at universities and community colleges. A number of states are acting on these priorities. In Florida, state funding to institutions of higher education now takes into account the institutions' number of STEM graduates. North Carolina's Board of Community Colleges, meanwhile, recently proposed a new stream of dedicated funding for STEM programs. Both of these approaches were informed by careful study of job openings data and other indicators of labor market dynamics.

Apart from attuning curricula to the labor market, state college systems should also increase the number of graduates in in-demand fields. Each year, thousands of would-be graduates drop out of college or abandon STEM majors for a variety of reasons, including financial hardship or poor grades. Over the years, this siphons away millions of would-be STEM workers. To address this problem, states and institutions of higher education should **take steps to boost student completion rates**. Strong student supports—including academic assistance through tutoring, expedited remediation, and summer bridge programs as well as nonacademic wrap-around services such as child care, transit subsidies, and financial aid—can make the difference between an employable graduate and a drop out, particularly for lower-income students.

However, because education is cumulative, special attention must also be given to earlier aspects of the preschool through high school years, upon which all else depends. States, local governments, and local districts **should increase the number and quality of STEM learning opportunities in high school** that provide students with college-level credit or career-relevant certifications in STEM fields. For example, high schools can take steps to increase the number of students taking Advanced Placement exams in computer science or engineering.<sup>128</sup> Likewise, districts may choose to forge partnerships with local community colleges and universities that let students enroll in college courses and pursue industry-relevant certifications while still in high school. Also crucial will be steps **to improve the quality of teaching in STEM disciplines in secondary and middle school**. High-quality teachers make a huge difference in students' lifetime learning, employment prospects, and earnings.<sup>129</sup>

Even more fundamental is the need to **ensure that all students have equal access to high-quality schools**, regardless of where they live or how much their parents earn. No child should be forced to attend a chronically low-performing school. Therefore, more school districts should work to improve student access to strong schools by empowering parents to make decisions about their children's education. At the same time, greater state and local support for public charter schools—when paired with strong accountability and performance measures—can further expand parents' options by introducing into the existing public school system new approaches to education.

Finally, there remains the need to intervene as early as possible to enhance children's lifetime learning potential. Early childhood education may seem remote from the demands of advanced industry competitiveness, but it is not. Irrefutable evidence now shows how crucial the earliest years of life are in shaping later cognitive and educational performance.<sup>130</sup> Likewise, compelling cost-benefit analyses show large returns to early childhood education.<sup>131</sup> For these and other reasons, state and local governments should **expand access to high-quality early education**. Universal pre-kindergarten and kindergarten could be the single most critical step states and regions take in securing the nation's long-term advanced industry skills base.

## Embrace the Ecosystem

Finally, firms, governments, and other relevant actors should work to strengthen the nation's regional advanced industry ecosystems. Innovation and skills development does not happen just anywhere.

It happens in places, most notably within metropolitan regions, where firms tend to cluster in close proximity, whether to profit from local knowledge flows, skilled workers, or regional supplier networks.<sup>132</sup> To be sure, the forces of globalization and dispersal remain powerful, as firms continue to shift industrial activity around the world depending on myriad technology, talent, and cost factors.<sup>133</sup> Nevertheless, the future of America's advanced industries will be heavily shaped by the depth and vibrancy of its innovation, workforce, and supply chain competencies, which, though embedded in regions, together compose the nation's industrial commons.<sup>134</sup> Regions that cultivate their local industrial ecosystems will be well positioned to nurture and capture the benefits from advanced industry growth.<sup>135</sup> Places that do not, will not.

Today, after decades of offshoring and disinvestment, America's advanced industry clusters are in too many places thin or eroded. It is therefore critical that firms and public-sector leaders work together to renew the vitality of the nation's regional advanced industries ecosystems, the most durable foundations of U.S. competitiveness in the sector.

### ***Strategies for the Private Sector***

To be sure, it may be difficult for private companies to justify investing directly in the shared industrial commons where they operate because they cannot capture all of what would be shared benefits. Despite this constraint, however, growing numbers of firms are coming to understand that vibrant local ecosystems matter intensely because of the difficult-to-replicate advantages they can provide.<sup>136</sup> These companies realize that dense local ecosystems can deliver solid business value by facilitating knowledge exchange, workforce matching, or supply chain aggregation, for example.

All of which suggests that advanced firms should do more to **factor the value of strong local ecosystems into strategy**. Specifically, companies should work harder to make the strategic value of local ecosystem benefits explicit in their planning and incorporate that value into a multidimensional "total factor performance" approach to decisionmaking.<sup>137</sup> Such an approach would move beyond simplistic assessments of local wage or transportation costs and take into account the full range of ways in which place affects a company's bottom-line and long-term prospects.

Some forward-thinking firms will choose to go further and **engage actively to upgrade local ecosystems**. Businesses are the actors best placed to identify and inform efforts to address ecosystem weaknesses, such as sluggish university-to-firm tech transfer or disconnected workforce training efforts.<sup>138</sup> Given that, advanced industry businesses can make outsized contributions by actively participating in regional economic development discussions, signaling key issues, and helping to shape community problem-solving.

Ultimately, corporations may elect to play more active roles in coordinating and delivering needed solutions. GE Appliances turned to the ecosystem in its Louisville backyard to enlist small companies and independent innovators in solving the design, prototyping, and parts challenges of the next generation of smart appliances.<sup>139</sup> The resulting GE FirstBuild microfactory leverages the utility of open innovation models by providing the company's engineers a well-outfitted space in which to invent, iterate, and take innovations to scale alongside University of Louisville researchers, independent industrial designers, start-ups, and enthusiasts.<sup>140</sup> Microsoft, for its part, is betting on Seattle's broader competitive advantage in the "Internet of Things" to establish an accelerator for promising local building automation start-ups.<sup>141</sup> Innovations developed by those companies may create new markets for Microsoft products. Cisco and Qualcomm have adopted similar strategies to build their local ecosystems to accelerate technology development in adjacent and emerging markets.<sup>142</sup> The driving motivation of these top firms is clear: The success of these companies depends on the health and innovative vitality of their local ecosystems.

### ***Strategies for the Public Sector***

Left to their own devices, however, profit-maximizing firms will not likely provide adequately for the broad health of regional ecosystems. For that reason, the public sector will always play an important role in maintaining and upgrading the nation's advanced industrial commons.

The federal government, for its part, should redouble its efforts to revitalize the nation's regional ecosystems by providing tools and platforms that acknowledge and leverage local clusters, networks, and other assets.

Along these lines, Washington should **expand the emerging “hubs and clusters” paradigm for co-investing in regional industrial ecosystems**. A variety of federal agencies have, in a somewhat piecemeal fashion, developed a smart set of programs for strengthening regional advanced industry ecosystems. One approach co-invests in regionally situated public-private research institutes as through the nascent NNMI, the Department of Energy's Energy Innovation Hubs, or the National Science Foundation's Engineering Research Centers (ERCs).<sup>144</sup> Another model seeks to foster emerging regional industry clusters with competitive grants such as those provided by the multi-agency Investing in Manufacturing Communities Partnership. Taken together, this pair of agendas responds to the need to embed federally supported centers for market-oriented applied problem-solving within vibrant regional industry clusters.

The logic of linking federal hubs to regional clusters should also prompt Washington to **reimagine federal assets in regions as ecosystem anchors and free them to engage in local economic development**. From the National Oceanic and Atmospheric Administration to the National Institute of Standards and Technology and the Department of Energy, federal agencies maintain a formidable array of innovation and talent centers in regions throughout the country. However, these institutions are not always active participants in their local ecosystems or attuned to their region's cluster needs.<sup>145</sup> Federal agencies should open their regional hubs to local exchanges. The Department of Energy's National Lab Impact Initiative and the U.S. Patent and Trademark Office's move to embed satellite offices in technology clusters across the country point in the right direction.<sup>146</sup>

However, Washington has neither the knowledge nor the capacity to play the lead role in strengthening regional industry concentrations. The bulk of the work must take place at the state and local levels.

State and local leaders—including regional civic, philanthropic, and development entities or trade associations—should **develop and maintain fine-grained, timely information on existing and emerging advanced industry clusters**. Such analyses can identify top industries and firms and analyze their specializations, interrelationships, and geography.

In addition, state and regional leaders can convert this granular intelligence into action by moving to **convene public-private partnerships to identify and implement strategies for enhancing local advanced industry ecosystems**. The State of Illinois, for example, is connecting firms to innovation resources, Washington State is aligning workforce training to industry needs, Colorado is developing a statewide advanced industry roadmap, and Oregon is facilitating collaborative research at a specialized R&D facility.<sup>147</sup> Locally, alliances of leaders in Chicago, Kansas City, Minneapolis-St. Paul, Northeast Ohio, and Syracuse, NY, have all used rigorous market analysis to inform regional strategies that strengthen local innovation networks, promote exports, attune worker training to firms' needs, cultivate supplier competencies, and develop shared research initiatives and test beds.<sup>148</sup>

Most places should prioritize cross-cutting initiatives that support the competitiveness of multiple advanced industries rather than focusing narrowly on single high-tech fields.<sup>149</sup> In all cases, states, however, should take special care to align their strategies with the “bottom-up” ecosystem-building efforts of local regions. In recent years, for example, the state of Washington threw its weight behind a Puget Sound Regional Council initiative to establish a building technologies demonstration and testing facility, providing investment and adding its heft to an application for federal funding.<sup>150</sup>

Metropolitan leaders, meanwhile, are increasingly responsible for building and maintaining local industrial ecosystems. Not only are city and metropolitan economic development leaders closest to the action, but they also control or influence key administrative areas such as zoning and real estate rules, education and training, and transportation.

Nor are cities and metropolitan areas just planning. Throughout the United States, cities and metropolitan areas are moving to **implement transformative initiatives to enhance local advanced industry ecosystems**. New York City, for example, is rectifying its lack of a venue for applied science and engineering by spearheading the development of the Applied Sciences NYC tech campus. Similar efforts to address workforce development challenges are underway elsewhere. In Ohio, actors from across the Greater Cincinnati region have forged the highly effective Partners for a Competitive Workforce, which serves as a coordinating body for the region's workforce development initiatives, sets priorities, and tracks progress in meeting employer demand for skills.<sup>51</sup>

Related to all of this is, finally, is the need for cities, counties, and their regional partners to expand their efforts to **meet the varied and changing spatial requirements of advanced industry production**. This priority reflects not just the varied location preferences and physical requirements of advanced firms but also local governments' special role in real estate, infrastructure, and neighborhood place-making. Localities must strive to provide and connect an increasingly wide variety of physical sites for advanced industry firms, ranging from exurban "mega-sites" that enable the joint location of industrial plants with their suppliers to modern urban collaboration spaces.<sup>52</sup>

**"The private, public, and civic sectors must work together in new ways to strengthen the fundamental sources of advanced industries vitality: innovation, technical skills, and dense ecosystems."**

## REIMAGINING AN URBAN CORRIDOR AS A LIFE SCIENCES INNOVATION DISTRICT: ST. LOUIS' CORTEX

Local leaders in the St. Louis area are capitalizing on emerging trends in the geography of innovation to develop an innovation district centered on the region's world-renowned strength in plant and life sciences research. Powered by the Cortex Innovation Community (Cortex), the district is fast establishing itself as a midwestern hub of commercialization and entrepreneurship.

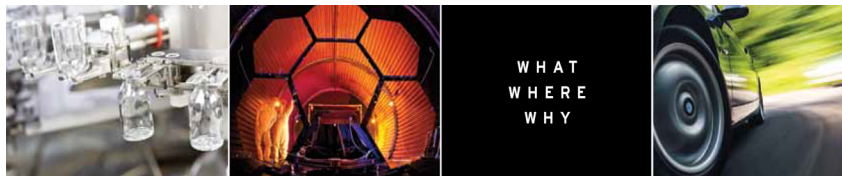
Cortex was formed in 2002 by a consortium of anchor institutions, which pooled local institutional and philanthropic funds with state tax credits and city resources to redevelop a stretch of downtown St. Louis. In the years since, it has been working with private- and public-sector stakeholders to transform the 928 acres, which includes St. Louis University, Washington University, and the BJH Healthcare district, into a center of research, enterprise, and collaboration as well as urban living.

Building on the talent and expertise in the anchor institutions, a rich cluster of startups and supporting organizations is forming alongside established firms such as DuPont Solae, a large supplier of soy protein products. Three innovation centers within the district support new and emerging technology companies by providing a rich array of innovation supports, including co-working office and lab space, events and programming, and access to capital. For example, BioGenerator provides seed funding and access to shared lab space at the early stages of company formation. It continues to work with companies as they transition to their next phase of development. The prominent Cambridge Innovation Center's (CIC) first expansion outside of Cambridge, MA, is also in Cortex. Dynamic young firms have also begun to recognize the benefits of locating in the area. All told, approximately 85 new life science, IT, engineering, consumer product, and professional services companies now reside in the district, including Manifest Digital, Confluence Life Sciences, aisle411 and Cultivation Capital, to name just a few. In total, they employ 2,800 workers.

Firm and job growth alone do not define the success of the district, however. The area's developing innovation ecosystem both shapes and is shaped by a changing physical realm. The Cortex West Redevelopment Corporation, the city-designated master developer of the area, has spurred the development of approximately 1.5 million square feet of office and research space, as well as housing, infrastructure, and retail, leveraging \$500 million in public, private, and civic capital. Cortex is working with the city to improve infrastructure and transit links. When the plan is fully built, it will ultimately help create a dynamic and inclusive innovation district where St. Louis' advanced industries, and the people who work within them, can continue to grow and thrive.

Sources: Bruce Katz and Julie Wager, "The Rise of Innovation Districts" (Washington, Brookings Institution, 2014); MassEconomics, "Innovation District Advisory Group" (2014); CORTEX website: <http://cortexstl.com>.

The importance of open knowledge flow, workforce matching, and complex partnerships suggests cities should work closely with their advanced industries to enhance such exchanges. The new direction is reflected in the dozens of cities working with private actors to enhance their local ecosystems by developing downtown co-working spaces, incubators, meeting places, and the like.<sup>153</sup> The trend is epitomized by the rise of "innovation districts": dense, amenity-rich enclaves in cities' cores where knowledge-intensive industries locate because of proximity to other firms, research labs, and universities. By doing so, they profit from the synergies of knowledge exchange and strong networks of firms in related fields.<sup>154</sup> Innovation districts already exist in the downtowns and midtowns of Cambridge, Detroit, Philadelphia, and St. Louis. In cities such as Boston and Seattle, underused areas—particularly older industrial lands—are being re-imagined as convenient focal points of the local ecosystem. These examples show how cities and their partners can help foster dense innovation ecosystems where knowledge-intensive advanced industries such as biotech, robotics, software, and telecom can thrive. ■



## VI. CONCLUSION

**T**his report identifies a distinct yet overlooked part of the economy—the advanced industries sector—that is at once critical to national well-being and under pressure from eroding competitiveness and national economic drift. In some regions, the sector is deep, vibrant, and globally competitive. In others, the sector has been hollowing out. In all places, its vibrancy is a prerequisite for improved opportunity amid regional and national prosperity.

Going forward, the private, public, and civic sectors must work together in new ways to strengthen the fundamental sources of advanced industries vitality: innovation, technical skills, and dense ecosystems. If they do, the nation will have a good shot at shoring up a key pillar of an opportunity economy. ■



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## ENDNOTES

1. In 2000, the U.S. maintained a \$5 billion trade surplus in advanced technology products, which, as the name suggests, is a product-based rather than an industry-based account. Since then, the country has run a trade deficit each year on such goods. By 2013, the deficit reached \$81 billion. U.S. Census Bureau, Foreign Trade Division, "Trade in Goods with Advance Technology Products" (2014).
2. For thorough discussions of the varied nature of particular manufacturing industries, see Susan Helper, Timothy Krueger, and Howard Wial, "Why Does Manufacturing Matter? Which Manufacturing Matters? A Policy Framework" (Washington: Brookings Institution, 2012); James Manyika and others, "Manufacturing the Future: The Next Era of Global Growth and Innovation" (San Francisco: McKinsey Global Institute, 2012). For a parallel discussion on services, see J. Bradford Jensen, "Global Trade in Services: Fear, Facts, and Offshoring" (Washington: Peterson Institute for International Economics, 2011).
3. More than one-half of all U.S. manufacturers now offer services as well as goods. On the topic generally, see Gregory Tassey, "Competing in Advanced Manufacturing: The Need for Improved Growth Models and Policies," *Journal of Economic Perspectives* 28 (1) (2014): 27-48; Manyika and others, "Manufacturing the Future." Tassey refers to the growing link between services and manufacturing as the "Fourth Industrial Revolution" and notes that economies of scale have been replaced by economies of scope in commercial importance. In other words, firms now derive greater value by grouping a variety of products and services together than by specializing in a single product and achieving scale. The trend has been underway for more than a decade in the United States, and advanced industries have been leading the way. Increasingly firms are protecting their core strengths by offering integrated "end-to-end" solutions that blur the distinction between their specific product and their aftermarket service. Moreover, many product manufacturers are able to capture higher margins by renting their capital-intensive machinery as a service platform instead. Rolls Royce, for example, has redesigned its airplane engine business from the manufacturing and sale of units to the manufacturing and leasing "hours" of flight. In doing so, the company is responsible for services such as maintenance and repairs on the engine. The diffusion of services as an accessory to products (and vice versa) allows firms to exist in an ever increasing number of industry categories even if their products do not.
4. See, for example, Gary Pisano and Willy Shih, "Restoring American Competitiveness," *Harvard Business Review* (July 2009); Andy Grove, "How America Can Create Jobs," *BusinessWeek*, July 1, 2010; Gregory Tassey, "Rationales and Mechanisms for Revitalizing U.S. Manufacturing R&D Strategies," *Journal of Technology Transfer* 35 (3) (2010): 283-333; Manyika and others, "Manufacturing the Future"; Suzanne Berger, *Making in America: From Innovation to Market* (Cambridge, MA: MIT Press, 2013).
5. For example, recent production methods known as *continuous manufacturing* dispatch the traditional R&D-design-production sequence with a far more iterative process in which design and improvements occur at the same time as production or service delivery. Doing so, however, requires interplay between engineers, designers, and shop floor production workers. Although product life cycles have grown shorter, bringing new technologies to market takes longer. See Tassey, "Rationales and Mechanisms"; and Gregory Tassey, "Beyond the Business Cycle: The Need for a Technology-based Growth Strategy" (Washington: National Institute of Standards and Technology, 2012).
6. Embedded software has not only transformed the physical composition of many traditional products (e.g. vehicle tires, cell phones, and traffic cameras) but is also replacing physical objects. For more discussions of the digitalization of the economy see Robert Atkinson and Andrew McKay, "Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution" (Washington: Information Technology and Innovation Foundation, 2007); Marc Andreessen, "Why Software is Eating the World," *Wall Street Journal*, August 20, 2011; Olivier de Weck and others, "Trends in Advanced Manufacturing Technology Innovation" (Boston: MIT's Production in the Innovation Economy, 2013); James Manyika and others, "Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy" (San Francisco: McKinsey Global Institute, 2013); Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W.W. Norton, 2014).
7. Whether innovation is accelerating or has entered a period of slower growth has become a topic of substantial debate. Economists Tyler Cowan and Robert Gordon believe that the U.S. economy has entered a long period of stagnation because the opportunity for productivity growth achieved by information technology is much lower than that of the large-scale innovations achieved in the postwar era. See Tyler Cowan, *The Great Stagnation: How America Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better Again* (New York: Dutton, 2011); Robert Gordon, "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds." Working Paper 18315 (Cambridge, MA: National Bureau of Economic Research, 2012). By contrast, economist Brynjolfsson and technologist McAfee have made the opposite argument and believe the returns of the IT revolution are accelerating

and “recombining” and will dramatically transform the U.S. economy. See Brynjolfsson and McAfee, *The Second Machine Age*. The reality is likely to be somewhere in the middle. Certain technology categories such as information technology and computing power seem to be growing at their historical fast pace while other areas, such as the life sciences, have seen a decline in R&D productivity.

8. For a compelling review of new technologies and the potential associated with their application, see Manyika and others, “Disruptive Technologies.”
9. See Organisation for Economic Co-operation and Development, “Measuring Trade in Value Added: An OECD-WTO Joint Initiative” (2013).
10. New research shows that the connectedness of firms through intermediate goods can be a source of productivity spillovers. In particular, Badinger and Egger find that firms that share similar characteristics like R&D or product categories see increases in their productivity when they are linked within supply chains. See Harald Badinger and Peter Egger, “Intra- and Inter-Industry Productivity Spillovers in OECD Manufacturing: A Spatial Econometric Perspective,” Working Paper 2181 (CESIFO, 2008). Also, in part because of high wages, Moretti predicts that every “high-tech” job supports five jobs elsewhere in the economy. See Enrico Moretti, *The New Geography of Jobs* (New York: Houghton Mifflin Harcourt, 2012).
11. Stephen Ezell and Robert Atkinson, “The Case for a National Manufacturing Strategy” (Washington: Information Technology and Innovation Foundation, 2011).
12. Increasing advanced manufacturing and services exports offers the most plausible strategy for ameliorating the U.S. trade deficit. See Martin Bailey and Robert Lawrence, “What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring,” *Brookings Papers on Economic Activity* 2 (2004): 211-284. See also Helper, Krueger, and Wial, “Why Does Manufacturing Matter?”
13. This paragraph reflects framings from the President’s Council of Advisors on Science and Technology, “Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing” (Washington: Executive Office of the President, 2012).
14. Significant research has documented that the quality of consumer durables has been increasing. See, for example, Mark Bils, “Do Higher Prices for New Goods Reflect Quality Growth or Inflation?” *Quarterly Journal of Economics* 124 (2) (2009): 637-675. See also Scott Andes and Mark Muro, “How Does Innovation Support Lower- and Middle-Class Families? Look to the Price Index,” *The Avenue*, November 25, 2014.
15. Economists have long argued that technology innovation is the only method for long-run growth because additional investment in current-generation capital and labor will always have diminishing returns. This implies that while poorer countries can grow rapidly because they have yet to saturate their economy with high levels of capital and labor, higher-income countries must rely on innovation to better use workers and machinery to increase productivity. Robert Solow, “A Contribution to the Theory of Economic Growth,” *Quarterly Journal of Economics* 70 (1) (1956): 64-94; Paul Romer, “Endogenous Technological Change,” *Journal of Political Economy* 98 (5) (1990): S71-S102. For a thorough discussion of why innovation matters to firms, regions, and nations, see Robert Atkinson and Howard Wial, “Boosting Productivity, Innovation, and Growth Through a National Innovation Foundation” (Washington: Brookings Institution, 2008).
16. To be sure, not all innovation is captured in official R&D figures, which do not count branding, marketing, or management approaches. Nevertheless, significant research confirms that R&D investment continues to be strongly associated with product and process “innovation” both at the firm and industry levels. See National Science Foundation, “Science and Engineering Indicators 2014” (2014); OECD, “R&D Tax Incentives: Rationale, Design, Evaluation” (2010).
17. R&D is associated with a number of positive economic outcomes for firms. Several papers find consistent R&D funding can help firms overcome the transitory profits of single innovations by supporting a steady stream of innovation. See G. Barczak, “New Product Strategy, Structure, Process, and Performance in Telecommunications Industry,” *Journal of Product Innovation Management* 12 (3) (1995): 224-234. Other studies confirm that R&D’s contribution to the development of innovative products and processes can be a critical determinant of firm performance. See, for example, R.A Bettis and Michael Hitt, “The New Competitive Landscape,” *Strategic Management Journal* 16 (1995): 7-19; C. Helfat and M.A. Peteraf, “The Dynamic Resources-Based View: Capabilities Lifecycle,” *Strategic Management Journal* 24 (10) (2003): 997-1010. Several studies have found specific links between R&D spending and the emergence of new product lines in the pharmaceutical industry. Paul Roberts, “Product Innovation, Product-Market Competition and Persistent Profitability in the



- Pharmaceutical Industry," *Strategic Management Journal* 20 (7): 655-670. Similar studies show R&D increases the number of patents in the computer and chemical manufacturing industries. See J. Hagedoorn and G. Duysters, "The Effects of Mergers and Acquisitions on the Technology Performance of Companies in a High-Tech Environment," *Technology Analysis and Strategic Management* 14 (1) (2002): 67-85. Other studies have found that although R&D influences invention (defined as patents) and innovation (defined as new product lines), its influence on product lines is much more strongly related to firm performance. See Kendall Artz and others, "A Longitudinal Study of the Impact of R&D, Patents, and Product Innovation on Firm Performance," *Journal of Product Development and Management Association* 27 (2010): 725-740.
18. David Audretsch, "Agglomeration and the Location of Innovative Activity," *Oxford Review of Economic Policy* 14 (2) (1998): 18-29.
  19. A positive economic "spillover," or externality, is any social benefit created by an economic entity that the originator cannot reap in profits. A significant body of research shows that the benefits of these spillovers radiate far beyond individual companies and industries and provide major benefits to society. For example, Jones and Williams find that the social rate of return for R&D is 30 percent, which, according to their calculations, implies that R&D levels would need to be four times higher to achieve society's optimal spillover benefits. See Charles Jones and John Williams, "Measuring the Social Return to R&D," *Quarterly Journal of Economics* 113 (4) (1998): 1119-1135. Kortum and Griliches each estimate that the social rate of return from R&D is three times higher than the private rate of return. See Samuel Kortum, "Research, Patenting, and Technological Change," *Econometrica* 65 (6) (1997): 1389-1419; Zvi Griliches, "The Search for R&D Spillovers," *Scandinavian Journal of Economics* 94 (1992): 29-47. In terms of how advanced industry innovation gains spread through the economy, the most obvious mechanism is through direct imitation. For example, by August 2010, just seven months after Apple unveiled the first iPad, there were over 32 iPad-like devices on the market in the United States. Although patents protect some of the most critical elements of new inventions, they are generally unable to protect against re-engineering and slight adjustments from competing firms. This may hurt the bottom line of inventing firms, but it is largely good for the economy because it creates competition, supports incremental improvements to technology, and reduces prices. In this vein, Segerstrom shows that imitation is a critical source of economic growth. See Paul Segerstrom, "Innovation, Imitation, and Economic Growth," *Econometrics and Economic Theory Paper* 8818 (Michigan State University, 1990). Another channel for the spread of innovation from advanced firms into the rest of the economy is the movement of skilled workers among employers across sectors. Tassey explains that much of the design and production intellectual property of a firm exists in the form of knowledge that workers accrue while on the job. When those workers go to other firms, they take that knowledge with them. Tambe and Hitt find that job-hopping among IT workers has a particularly powerful impact across sectors. See Tassey, "Competing in Advanced Manufacturing"; Prasanna Tambe and Lorin Hitt, "Job Hopping, Information Technology Spillovers, and Productivity Growth," *Management Science* 60 (2) (2014): 338-355.
  20. "General purpose technologies" are different from other technologies in their ability to significantly increase productivity *outside* of the industry in which they originate. For example, in the early years of IT, the majority of productivity gains to the U.S. economy came from the IT-producing sector and firms such as Microsoft and IBM. However, by the mid-1990s, as productivity growth in the United States exceeded 3 percent per year, the bulk of the growth gains took place in the IT-using rather than in the IT-producing sector. In particular, U.S. service industries were adopting IT and because services are the largest portion of the economy, overall productivity grew rapidly. For discussions of general purpose technologies and their broad impact, see Tim Bresnahan and Manuel Trajtenberg, "General Purpose Technologies: Engines of Growth?" *Journal of Econometrics* 65 (1995): 83-108; Richard Lipsey, *Economic Transformations: General Purpose Technologies and Long Term Growth* (Oxford: Oxford University Press, 2005). Also see Robert Atkinson, *Long Waves of Innovation that Power Cycles of Growth* (New York: Edward Elgar, 2005).
  21. David Byrne, Stephen Oliner, and Daniel Sichel, "Is the Information Technology Revolution Over?" Working Paper 2013-36 (Washington, DC: Federal Reserve Board, 2013); Erik Brynjolfsson and Adam Saunders, *Wired for Innovation: How Information Technology is Reshaping the Economy* (Cambridge, MA: MIT Press, 2010). See also, among other publications, K. J. Stiroh, "Information Technology and the U.S. Productivity Revival: What Do the Industry Data Say?" *American Economic Review* 92 (5) (2002): 1559-1576; Dale Jorgenson, Mun S. Ho, and Kevin Stiroh, "Will the U.S. Productivity Resurgence Continue?" *Current Issues in Economics and Finance* 10 (13) (2004): 1-7; Dale Jorgenson, Mun S. Ho, and Kevin Stiroh, "A Retrospective Look at the U.S. Productivity Resurgence," *Journal of Economic Perspectives* 22 (1) (2008): 3-24.
  22. Information technology, new drugs, bioengineered seeds, cheaper materials, and new energy sources (to name a few) have all contributed to the U.S. and global economies far beyond what their industries' shares of total GDP suggest. In the pharmaceutical industry, Lichtenberg and Petterson found that drug innovations between 1997 and 2010 extended the life expectancy of the average Swedish citizen by six months at a cost of just \$109 per year. See

Frank Lichtenberg and Billie Pettersson, "The Impact of Pharmaceutical Innovation on Longevity and Medical Expenditure in Sweden, 1997-2012: Evidence from Longitudinal, Disease-Level Data." Working Paper 3894 (Munich: CESifo, 2012). In material science, McKinsey & Co. predicts that the advent of lighter materials will reduce the cost of the current fleet of commercial airplanes by 30 percent. See McKinsey & Co., "Lightweight, Heavy Impact: How Carbon Fiber and Other Lightweight Materials Will Develop Across Industries and Specifically in Automotive" (San Francisco, 2013). Finally, the economic benefits of genetically modified crops to U.S. agriculture during the last 15 years are estimated to equal \$98.2 billion. See Graham Brookes and Peter Barfoot, "GM Crops: Global Socio-Economic and Environmental Impacts 1996-2011" (London: PG Economics, 2013).

23. Ibid.
24. See Anthony Carnevale, Nicole Smith, and Michelle Melton, "STEM: Science, Technology, Engineering, Mathematics" (Washington: Georgetown University Center on Education and the Workforce, 2011); Jonathan Rothwell, "The Hidden STEM Economy" (Washington: Brookings Institution, 2013).
25. Rothwell, "Hidden STEM Economy." See also Philip Toner, Tim Turpin, and Richard Woolley, "The Role and Contribution of Tradespeople and Technicians in Australian Research and Development: An Exploratory Study" (Sydney: Center for Industry and Innovation Studies, 2010); Phillip Toner, "Tradespeople and Technicians in Innovation." In Penelope Curtin, John Stanwick, and Francesca Beddie, eds., *Fostering Enterprise: The Innovation and Skills Nexus—Research Readings* (Adelaide: National Center for Vocational Education Research, 2012).
26. Based on Brookings analysis of advanced industry occupations. See chapter 4 of this report. Carnevale, Smith, and Melton, "STEM."
27. Ibid.
28. See, for example, Mark Muro and Bruce Katz, "The New Cluster Moment: How Regional Innovation Clusters Can Foster the Next Economy" (Washington: Brookings Institution, 2010). See also S. Rosenthal and W. Strange, "Evidence on the Nature and Sources of Agglomeration Economies." In J.V. Henderson and J.F. Thisse, eds., *Handbook of Regional and Urban Economics*, vol. 4 (Amsterdam, North-Holland: 2004); MaryAnn Feldman and David Audretsch, "Innovation in Cities: Science-based Diversity, Specialization, and Localized Competition," *European Economic Review* 43 (1999): 409-429; and Tasse, "Competing in Advanced Manufacturing."
29. Jonathan Rothwell and others have noted the association of metropolitan patenting levels with numerous other indicators of regional prosperity, including higher productivity growth, lower unemployment rates, and the creation of more publicly traded companies. See Jonathan Rothwell and others, "Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas" (Washington: Brookings Institution, 2013). Rothwell has also demonstrated that STEM-oriented metropolitan economies exhibit stronger job growth and employment rates, higher wages, and lower income inequality than other metro areas. See Rothwell, "Hidden STEM Economy."
30. Numerous commentators have noticed the phenomenon of industry convergence driven by technology convergence. See, for example, Christopher Barnatt's discussion of the blurring of manufacturing, medicine, and media. Christopher Barnatt, "The New Industrial Convergence," (blog post) [www.ExplainingTheFuture.com](http://www.ExplainingTheFuture.com). Delgado, Porter, and Stern, meanwhile, show empirically that the agglomeration of related industries into strong clusters in a region not only improves the economic performance of existing industries but also matters significantly for the emergence of new industries in a region. Mercedes Delgado, Michael Porter, and Scott Stern, "Clusters, Convergence, and Economic Performance." Working Paper 18250 (Cambridge, MA: National Bureau of Economic Research, 2012).
31. See Bruce Katz and Julie Wagner, "The Rise of Innovation Districts: A New Geography of Innovation in America" (Washington: Brookings Institution, 2014).
32. A number of other authors have used similar methods to define the high-tech section of the economy. Hecker evaluates the high technology sector of the economy using similar terms of R&D and workforce skills. Daniel Hecker, "High-Technology Employment: A Broader View," *Monthly Labor Review* (June 1999):18-28. The Milken Institute's 1999 and 2009 reports on "America's High-Tech Economy" and "North America's High-Tech Economy," respectively, include a broader number of services in the high-tech sector, but do not include as many manufacturing industries as we do here. See Ross DeVol, "America's High-Tech Economy: Growth, Development, and Risks for Metropolitan Areas" (San Francisco: Milken Institute, 1999); Ross DeVol and others, "North America's High Tech Economy: The Geography of Knowledge-Based Industries" (San Francisco: Milken Institute, 2009).

33. Romer, "Endogenous Technological Change;" Solow, "A Contribution to the Theory of Economic Growth;" and Joseph Schumpeter, *The Theory of Economic Development* (Cambridge, MA: Harvard University Press, 1934).
34. Gene Grossman and Elhanan Helpman, *Innovation and Growth in the Global Economy* (Cambridge, MA: MIT Press, 1991); Paul Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy* 94 (5) (1986): 1002-1037; and Philippe Aghion and Peter Howitt, "A Model of Growth Through Creative Destruction," *Econometrica* 60 (2) (1992): 323-351.
35. See, among others, Toner, "Tradespeople and Technicians in Innovation"; Toner and others, "The Role and Contribution of Tradespeople;" and Philip Toner, "Innovation and Vocational Education," *Educational and Labor Relations Review* 21 (2) (2010): 75-98.
36. Frank Lichtenberg, "R&D Investment and International Productivity Differences." Working Paper 4161 (Cambridge, MA: National Bureau of Economic Research, 1992); Manuel Trajtenberg, *Economic Analysis of Product Innovation* (Cambridge: Cambridge University Press, 1990); Griliches, "Search for R&D Spillovers;" and David Audretsch and MaryAnn Feldman, "R&D Spillovers and the Geography of Innovation and Production," *American Economic Review* 86 (3) (1996): 630-640.
37. The BRDIS offers a more complete measure of industry spending on R&D than other sources because it provides information at the four-digit NAICS industry code level and categorizes R&D spending by lines of business rather than establishment industry classification.
38. See Rothwell, "Hidden STEM Economy," for a definition and application of this approach.
39. See, for example, DeVoi, "America's High-Tech Economy;" Daniel Hecker, "High-Technology Employment: A NAICS-Based Update," *Monthly Labor Review* (July 2005): 57-72; and Helper, Krueger, and Wial, "Locating American Manufacturing."
40. Across OECD countries the correlation between R&D as a share of GDP and GDP per worker is 0.35, but it is 0.69 for R&D per worker and GDP per worker. The correlation with patents per worker is also higher using R&D per worker (0.78 versus 0.73).
41. The correlations are 0.69 versus 0.50. The meth for determining patents by industry is discussed in online appendix accompanying this report.
42. Rothwell, "Hidden STEM Economy."
43. The advanced industries sector is defined as the group of 50, four-digit industries that meet the criteria enumerated in this report in the latest year for which data are available. Accordingly, the industries that compose the sector do not change over time; any time series reports the history of the advanced industries sector as defined today. As it happens, most industries that meet the advanced industry criteria today would also have met the criteria in 1980.
44. Petroleum and coal products manufacturing, while closely related to and on many economic indicators performing like an energy industry, is nevertheless classified according to its NAICS code as a manufacturing industry.
45. These figures are derived from the Bureau of Economic Analysis' 2007 Input-Output Use Tables for values and Moody's Analytics for employment. We converted 2007 prices into 2013 prices using the BEA's GDP price index.
46. Nationally, the computer and electronics manufacturing industries have achieved the highest productivity growth in recent years. Economists have attributed some of this extraordinary growth (roughly 20 percent per year) to data collection problems related to the importation of component parts. Although this documented phenomenon does likely overstate advanced industry productivity levels and growth to some extent, this critique does not apply to advanced services and other advanced manufacturing sectors, which have also seen very high productivity growth. Forty-six of the 50 advanced industries experienced productivity growth above rates in other industry (1.3 percent) from 1980 to 2013. Among the industries with 3.5 percent annual real productivity growth or higher are wireless telecommunications, satellite telecommunications, and software publishing.

47. Total compensation refers to BEA's definition of wages and salaries, which includes benefits such as 401k contributions and stock options.
48. Much of the advanced industry earnings premium is accounted for by education, experience, and gender. The premium falls to 38 percent after adjusting for these factors. This is true both within and across metropolitan areas, so the premium cannot be attributed to regional cost of living differences. Adding occupation to the list of controls lowers the premium to 23 percent. Still, this is remarkable. Workers in the same type of job, with the same education and experience are paid 23 percent higher, on average, if they are in the advanced industries sector. The premium is high at every educational level.
49. Advanced service industry wages rose 91 percent from 1975 to 2013. Salaries in advanced energy industries grew by 81 percent. Even advanced manufacturing saw 42 percent salary growth, far above the 15 percent growth in other manufacturing industries.
50. Orientation is determined by location quotients, details of which can be found in the online appendix accompanying this report.
51. Specialization defined as a location quotient greater than 2.0, meaning that, as a share of total area employment, the industry is twice as large locally as it is nationally.
52. Specialization defined as a location quotient greater than 2.0, meaning that, as a share of total area employment, the industry is twice as large locally as it is nationally.
53. This finding is based on a regression analysis using a metropolitan panel of 2012 advanced industry employment shares on 1980 advanced industry employment shares, 1980 bachelor's degree attainment rates, the number of university research-based doctoral programs, the number of patents granted to local residents from 1976 to 1980, population in 1980, and state fixed effects. Bachelor's degree attainment, patenting, research universities, and previous advanced industry employment were all statistically significant. A dummy variable for right-to-work state was significant if state fixed effects were dropped.
54. Data are from OECD. See Methods section for description of sources.
55. OECD data do not contain observations from the Republic of Korea (South Korea) in employment tables but do so in output (GDP) tables, hence the expansion to 15 observations.
56. We estimate that advanced industries generate two-thirds of U.S. royalty income. To arrive at that number, we examined Internal Revenue Service (IRS) data on royalty payments by industry for foreign-owned companies operating in the United States; 69 percent of such payments were registered by advanced industries. We assume that the ratio holds for domestically owned companies as well.
57. For a discussion of and national benchmarking of international trade barriers across nations, see Michelle Wein, Stephen Ezell, and Robert Atkinson, "The Global Mercantilist Index: A New Approach to Ranking Nations' Trade Policies" (Washington: Information Technology and Innovation Foundation, 2014).
58. A patent, by legislative definition, must be novel and useful and goes through a rigorous approval process at the U.S. Patent and Trademark Office (USPTO). Patents vary greatly in value, but there is strong evidence that, on average, they signal economically valuable inventions and are often the culmination of formal R&D. For that reason they are an accepted proxy for innovative activity. For more see Rothwell and others, "Patenting Prosperity."
59. Rothwell and others, "Patenting Prosperity."
60. Software patenting is controversial because applications are often written for ambiguous functions rather than for specific methods for solving technical problems. With that said, software patents appear to represent actually valuable inventions in most cases. See Mark Lemley, "Software Patents and the Return of Functional Claiming," Working Paper 2117302 (Stanford Public Law, 2012) and Rothwell and others, "Patenting Prosperity."

61. Calculated using the Bureau of Labor Statistics' Producer Price Index. For a detailed discussion of the methodology, see the online appendix accompanying this report.
62. Andes and Muro, "Look to the Price Index."
63. Unless otherwise noted, all international comparisons are calculated using OECD data. For a detailed discussion of sources and methodologies, see the online appendix accompanying this report.
64. The two higher-quality patent measures are triadic patents—those granted by the European and Japanese patent offices and with applications into or approval by the U.S. Patent and Trademark Office as well—and Patent Cooperation Treaty applications—a universal application that signals intent to seek intellectual property protection by multiple offices. The OECD collects data on both measures. For a detailed discussion of sources and methods, see the online appendix accompanying this report.
65. Michael S. Teitelbaum, *Falling Behind? Boom, Bust and the Global Race for Scientific Talent* (Princeton University Press, 2014).
66. For example, in terms of average number of citations in scientific journals adjusted for field, the world's top 16 universities are all located in the United States. Such research universities draw top scientists from around the world, so much so that 39 percent of the most highly cited journal articles are published by scholars at U.S. universities. The quality of research universities was assessed using the Leiden University Center for Science and Technology Studies (CWTS) ranking, which is recognized to offer the most straightforward and comprehensive assessment of academic research quality and output from around the world. For a detailed discussion of sources and methodologies, see the online appendix accompanying this report.
67. The nine countries are, in order, Switzerland, Denmark, Netherlands, Sweden, Singapore, United Kingdom, Israel, Canada, and Belgium.
68. Data collected by the OECD. For a detailed discussion of sources and methodologies, see the online appendix accompanying this report.
69. Job openings data by industry and occupation are obtained from Burning Glass, a workforce information company that collects detailed information on nearly all internet-based job advertisements. For a detailed description of the data and methods underlying the analysis that follows, see the online appendix accompanying this report and Jonathan Rothwell, "Still Searching: Job Vacancies and STEM Skills" (Washington: Brookings Institution, 2014).
70. See U.S. Department of Education, National Center for Education Statistics. On the Program for International Student Assessment (PISA) exams, which assess students across countries at the eighth grade level, the United States ranks below the OECD average on mathematics. On the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) exams, the United States ranks 21st of 23rd on adult numeracy. The United States does perform well on the Trends in International Mathematics and Science Study (TIMSS), which also assesses student competencies but is more directly linked to school curriculum than PISA. The latter emphasizes more applied knowledge. For a comparison of PISA and TIMSS, see Tom Loveless, "International Tests Are Not All the Same" (Washington: Brookings Institution, 2013).
71. Data from the OECD. STEM fields include the life, physical, math, and computer sciences as well as engineering.
72. This age cohort is used to approximate a country's STEM graduation rate, or the relative volume at which it is graduating STEM-trained workers.
73. This passage draws on discussion in Manyika and others, "Manufacturing the Future," and Manyika and others, "Disruptive Technologies." See also Mark Muro and others, "Launch! Taking Colorado's Space Economy to the Next Level" (Washington: Brookings Institution, 2012); Mark Muro and others, "Drive! Moving Tennessee's Automotive Sector Up the Value Chain" (Washington: Brookings Institution, 2013).
74. General Electric Corp., "Global Innovation Barometer" (2014).
75. This paragraph and the one following it draw on Stephen Ezell and Robert Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National

- Traded Sector Competitiveness Strategy" (Washington: Information Technology and Innovation Foundation, 2012). See also Mark Muro and others, "Powering Advanced Industries State by State" (Washington: Brookings Institution, 2014); Muro and others, "Launch!" and "Drive!"
76. For a suggestions on how to reform the corporate tax code to maximize innovation-led, productive economic growth, see Robert Atkinson, "Effective Corporate Tax Reform in the Global Innovation Economy" (Washington: Information Technology and Innovation Foundation, 2009); Martin Neil Baily and Barry Bosworth, "U.S. Manufacturing: Understanding Its Past and Its Potential Future," *Journal of Economic Perspectives* 28 (1) (2014): 3-26.
  77. For Brookings' writings on the metropolitan perspective to these issues, see Alan Berube and Joseph Parilla, "Metro Trade: Cities Return to Their Roots in the Global Economy" (Washington: Brookings Institution, 2012); Devashree Saha, Kenan Fikri, and Nick Marchio, "FDI in U.S. Metro Areas: The Geography of Jobs in Foreign-Owned Establishments" (Washington: Brookings Institution, 2014); and Emilia Istrate, Jonathan Rothwell, and Bruce Katz, "Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness" (Washington: Brookings Institution, 2010).
  78. For a review of nations' trade barriers and needed U.S. responses see Wein, Ezell, and Atkinson, "Global Mercantilist Index."
  79. Imperfections in the market for technology-intensive small business lending provide the rationale for targeted interventions by the public sector. The OECD identifies several financing instruments that public policy can support as particularly effective in promoting innovation: bank loans, grants and subsidies, angel investment, venture capital, corporate venturing, crowd-funding, and tax incentives. Organisation for Economic Co-operation and Development, "STI Policy Profiles: Building Competencies and Capacity to Innovate," In *Science, Technology, and Industry Outlook 2012* (2012).
  80. Brookings scholars Robert Puentes and Adie Tomer have built a large body of work articulating the critical role of infrastructure in the efficient and productive working of modern economies and outlining the priorities of a national infrastructure strategy. See, for starters, Robert Puentes and others, "The Way Forward: A New Economic Vision for America's Infrastructure" (New York: Kohlberg Kravis Roberts & Co., 2014); Adie Tomer, Joseph Kane, and Robert Puentes, "Metro Freight: The Global Goods Trade that Moves Metro Economies" (Washington: Brookings Institution, 2013); Adie Tomer, Robert Puentes, and Zachary Neal, "Global Gateways: International Aviation in Metropolitan America" (Washington: Brookings Institution, 2012); Robert Puentes, "A Bridge to Somewhere: Rethinking American Transportation for the 21st Century" (Washington: Brookings Institution, 2008).
  81. The National Governors Association (NGA) captures several recent related trends in best economic development practice among states, including the strengthening of state and regional collaboration and the targeting of support on key clusters, especially advanced manufacturing. NGA has also been critical in advancing the "sector strategies" model of workforce development among states, which is organized around industry-driven partnerships among education, training, economic development, and other relevant organizations to define and meet the needs of specific key strategic industries. See NGA, "Top Trends in State Economic Development" (2013); NGA "State Sector Strategies Coming of Age: Implications for State Workforce Policymakers" (2013). Maryland's cybersecurity industry strategy stands out as particularly comprehensive and effective in consolidating the state's emerging advantage in the industry. The 2010 CyberMaryland report articulated a clear vision for the industry's development in the state. The appointment of an executive director of cybersecurity development in 2013 within the state Department of Business and Economic Development underscored a lasting commitment to the sector. To learn more, visit <http://business.maryland.gov/about/key-industries/it-and-cybersecurity>. The states of Colorado and Tennessee, for their part, have undertaken such strategy development to advance the competitiveness of their space and automotive industries, respectively, as well as their advanced industry bases generally. Stakeholders from across the state and the private sector informed both strategies through a series of listening sessions. In Colorado, the initiative piggybacked on a wider "Key Industry Process," in which the state's economic development office consulted extensively with businesses representing all of the state's primary clusters. The process resulted in the state undertaking an advanced industry road-mapping exercise that is currently underway. The road-mapping involves identifying the state's advanced industry companies and assets as well as an assessment of the shared technologies and platforms that unite the state's clusters. Ultimately, the road-mapping exercise is intended inform state investment in a shared research facility to cut across the state's clusters and anchor Colorado's advanced industry enterprise. Brookings guided both states in their efforts with the reports by Muro and others, "Launch!" and "Drive!" respectively, each published in 2013.
  82. States and localities will be best served by a "high-road" strategy to nurture and expand their advanced industry bases. Such strategies see leaders put delivering value for money over offering the lowest headline tax rates. States and localities stand to cultivate a much more durable advantage if they maintain rather than sacrifice investment in schools, universities, physical infrastructure, and softer cluster infrastructure such as shared research spaces

for small and mid-sized enterprises or investment in public-private industry initiatives. It should also go without saying that the most effective fiscal policies are done through the tax code and not inducements offered to single firms in an opaque manner and on a preferential basis. With regard to specific policies, R&D tax credits have proved popular and are currently in place in 37 states. However, in contrast to the federal R&D tax credit, which has been shown to induce R&D that otherwise would not have occurred, recent empirical evidence suggests that state credits simply shift activity from one locality to another. See Daniel Wilson, "Beggar Thy Neighbor? The In-State, Out-of-State, and Aggregated Effects of R&D Tax Credits." Working Paper 2005-08 (Federal Reserve Bank of San Francisco, 2007). For evidence on their effectiveness, however, see Bronwyn Hall and Jon van Reenan, "How Effective Are Fiscal Incentives for R&D? A Review of the Evidence," *Research Policy* 29 (2000): 449-469. Capital expenditures credits have also been shown to support process innovation in firms. See Stacy Tevlin and Karl Whelan, "Explaining the Investment Boom of the 1990s," *Journal of Money, Credit, and Banking* 35 (2003): 1-22; Robert Chirinko, Steven Fazzari and Andrew Myer, "The Elusive Elasticity: A Long-Panel Approach to Estimating the Price Sensitivity of Business Capital," 10th International Conference on Panel Data, Berlin, Germany, July 5-6, 2002.

83. Given that both exports and investment attraction are functions of the global reach of local competitive advantages, policymakers and practitioners will find economies of scale and scope in adopting a unified approach to these issues, which are too often kept separate. For more, see National Governors Association, "State Strategies for Global Trade and Investment" (2014). On export financings for small and mid-sized businesses, see Kati Suominen and Jessica Lee, "Bridging the Trade Finance Gaps: State-Led Innovations to Bolster SME Exports" (Washington: Brookings Institution, 2014). For additional background, see Saha, Fikri, and Marchio, "FDI in U.S. Metro Areas" and Brad McDearman, Greg Clark, and Joseph Parilla, "The 10 Traits of Globally Fluent Metro Areas" (Washington: Brookings Institution, 2013).
84. Several states have created innovative strategies for increasing access to capital at critical stages of technology development for small and mid-sized enterprises. Innovation voucher programs, where such firms apply for small vouchers redeemable at participating research institutions such as universities for specific R&D services, offer a new and promising model. Utah has adapted the venture capital model to form a "Fund of Funds," which invests in private venture firms that themselves promise to invest in Utah companies, authorizing an as-yet-untapped \$300 million tax credit to investors in case the fund loses money. The program leverages the power of a public backstop to increase private investment in the state and takes advantage of venture firms' considerable investment, risk, and mentoring expertise.
85. Robert Puentes and Bruce Katz, "To Fix America's Infrastructure, Washington Needs to Get Out of the Way," *Forbes*, May 9, 2014; Puentes and others, "A New Vision for America's Infrastructure."
86. Tassey, "Beyond the Business Cycle."
87. As discrete technologies are replaced by *technology systems*, the locus and speed of R&D is changing dramatically and becoming increasingly nonlinear. Novel components and segments of production must seamlessly fit within larger component categories. Basic research in one area of production will affect incremental, or applied, research or manufacturing in other areas. Innovative firms can no longer expect to accelerate new products to market by "owning" one segment of R&D. Successful firms are able to work with key suppliers and toggle between basic and applied R&D—in both product and process R&D—to bring a new product or service to market. For a more complete explanation of technology systems and the interplay between basic and applied research, see Tassey, "Competing in Advanced Manufacturing." For a review of the coordination needed between firms at different stages of R&D given shortening product life cycles, see Pisano and Shih, "Restoring American Competitiveness." From the energy and national labs perspective, see also James Duderstadt and others, "Energy Discovery-Innovation Institutes: A Step Toward America's Energy Sustainability" (Washington: Brookings Institution, 2009); Henry Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Cambridge, MA: Harvard Business School Press, 2003).
88. McKinsey & Co., "The Future of the North American Automotive Supplier Industry: Evolution of Components Costs, Penetration, and Value Creation Potential Through 2020" (2012); Mariana Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (London: Anthem Press, 2013).
89. Between 1999 and 2009, the latest year of comprehensive data, U.S. private-sector R&D as a percentage of GDP grew by 4 percent. By comparison, Finland, Japan, Denmark, South Korea, and China have seen their private-sector R&D grow at a rate of 9, 29, 43, and 256 percent, respectively. See Robert Atkinson and Scott Andes, "The Atlantic Century II: Benchmarking EU and U.S. Innovation and Competitiveness" (Washington: Information Technology and Innovation Foundation, 2011).

90. The private sector has been conducting a declining share of basic R&D for several decades, despite steady increases in overall private-sector R&D. In 1960, the private sector represented nearly one-third of all basic R&D. Today, private sector R&D makes up 18 percent of basic R&D. On the other hand, at more than 80 percent of total U.S. development research, the private sector is the main thoroughfare for bringing inventions to market. See National Science Foundation, *Science and Engineering Indicators 2014* (2014).
91. Vanessa Chan, Marc de Jong, and Vidyadhar Ranade, "Finding the Sweet Spot for Allocating Innovation Resources," *McKinsey Quarterly*, May 2014.
92. U.S. private-sector investment in capital equipment is at its lowest levels since the 1970s. See Bureau of Economic Analysis, "Real Private Fixed Investment in Equipment and Software" (2012).
93. Daniel Pachthod and Michael Park, "How Can the U.S. Advanced Industries Sector Maintain Its Competitiveness?" (New York: McKinsey Global Institute, 2012).
94. Ibid.
95. Manyika and others, "Manufacturing the Future."
96. For more information on the initiative, see "The Nissan Supply Chain Initiative Supplier Development Program 2014" (Nashville: University of Tennessee Center for Industrial Services, December 2014).
97. In 1950, federal R&D represented 1.2 percent of total GDP. By the mid-1960s during the energy crisis and race to the moon, federal R&D represented just over 1.8 percent of GDP. Beginning in the 1970s, federal R&D contributions as a share of the economy began to fall. By 1990, the rate was below that of 1950 and today, for the first time since WWII, it stands at less than 1 percent of GDP. See National Science Foundation, *Science and Engineering Indicators 2014*. In the near term, there is also little evidence that the federal government is willing to recommit to its R&D expenditures. The Obama administration's FY2015 budget calls for a 1.2 percent increase in federal R&D spending, an amount that will not even keep pace with inflation. See also Martin Grueber and Tim Studt, "2014 Global R&D Funding Forecast," *R&D Magazine*, December 2013.
98. Robert Hinck, "R&D Funding, Obama v. Bush" (Washington: Center for Strategic and International Studies, 2010).
99. Applied research fell from a high of 0.37 percent of GDP in 1964 to 0.18 percent in 2013, while development funding fell from 1.51 to 0.42 percent during the same period. National Science Foundation, *Science and Engineering Indicators 2014*.
100. On the Energy Innovation Hub see <http://energy.gov/science-innovation/innovation/hubs>; and Duderstadt and others, "Energy Discovery-Innovation Institutes." About the National Network for Manufacturing Institutes see David Hart, Stephen Ezell, and Robert Atkinson, "Why America Needs a National Network for Manufacturing Innovation" (Washington: Information Technology and Innovation Foundation, 2012); Devashree Saha, "Create a Nationwide Network of Advanced Innovation Hubs" (Washington: Brookings Institution, 2013); and National Science and Technology Council, "National Network for Manufacturing Innovation: A Preliminary Design" (Washington: Executive Office of the President, 2013).
101. See, for example, a number of the "bottom-up" regional strategies being developed through the Brookings-Rockefeller Project on State and Metropolitan Innovation. For more information visit: [www.brookings.edu/about/projects/state-metro-innovation](http://www.brookings.edu/about/projects/state-metro-innovation).
102. Robert Atkinson, "Innovation in Cities and Innovation by Cities" (Washington: Information Technology and Innovation Foundation, 2012).
103. For example, New York City Mayor Michael Bloomberg's Applied Science NYC initiative forges a partnership with Cornell University and Technion-Israel Institute of Technology to create the "NYCTech" campus on Roosevelt Island. Similarly, in Seattle, the University of Washington has moved its medical research into South Lake Union to be closer to downtown. See Katz and Wagner, "Innovation Districts."



104. The New Mexico Small Business Assistance program (NMSBA) is a good model for a national lab voucher program. Since its inception, the program has helped more than 1,000 small businesses work with Sandia and Los Alamos national labs to solve short-term technology problems. While it is true that labs currently have technology assistance funds, NMSBA is unique in that the state government is a partner and provides the financing for the program. Such a model provides labs the incentive to consider state economic development strategies more fully in their small and midsized business outreach efforts. More recently, the state of Tennessee and Oak Ridge National Laboratory (ORNL) have been working together to create a new voucher program called “Revvi!” that will offer \$2.5 million in state-funded innovation vouchers of varying sizes so that Tennessee manufacturers can “purchase” services from ORNL. See “The New Mexico Small Business Assistance Program,” available at [www.nmsbaprogram.org](http://www.nmsbaprogram.org); and Muro and others, “Powering Advanced Industries.”
105. For a full discussion of innovation vouchers, see Muro and others, “Drive!”
106. Colorado’s Advanced Industries Accelerator Programs are a recent example. See Muro and others, “Powering Advanced Industries.”
107. Rothwell, “Still Searching.”
108. Thomas Kochan, David Finegold, and Paul Osterman, “Who Can Fix the ‘Middle-Skills’ Gap?” *Harvard Business Review*, December 2012; Jonathan Rothwell, “Understanding Hiring Difficulty: It’s Not that Complicated,” *The Avenue*, July 11, 2014; and Rothwell, “Still Searching.”
109. Mark Zandi, “U.S. Macro Outlook: How the Labor Market Heals” (New York: Moody’s Analytics, 2014).
110. During the global recessions, firms had a singular clarion call: reduce costs. Because cost pressure was so strong and companies were seeking to reduce payroll by such large margins, workforce reductions were pursued based on near-term market requirements without moderate-term forecasting. Now that the economy is growing again, firms will need to consider how fast to expand their workforces. Peter Cappelli and others have written about the importance of talent management strategies in times of growth. High-skilled workers are similar to inventory; it is important to have enough capacity to meet demand but too “deep a bench” increases costs. Talent management is extremely important as firms begin to forecast how fast demand will grow. See David Smith and others, “The Talent to Grow” (New York: Accenture, 2011); Peter Cappelli, *Talent on Demand: Managing Talent in an Age of Uncertainty* (Boston: Harvard Business School Publishing, 2008).
111. Ibid.
112. For discussions of the skills needed in the software industry and how they may differ from purely academic training see Matt Weisfeld, “What Skills Employers Want in a Software Developer: My Conversations with Companies Who Hire Programmers,” *InformIT*, November 12, 2013. For discussion of the rise of the manufacturing skills certification movement, see the website of the Manufacturing Skill Standards Council at [www.msscusa.org](http://www.msscusa.org)
113. Weisfeld, “What Skills Employers Want.”
114. The private sector has often been criticized for paying only sporadic attention to regional workforce pipelines and eschewing deeper engagements in curriculum design, professional development, or long-term mentorships. See “Lasting Impact: A Business Leader’s Playbook for Supporting America’s Schools” (Boston: Harvard Business School, 2013).
115. Ibid.
116. For more information visit P-TECH’s website at [www.ptechnyc.org](http://www.ptechnyc.org).
117. Nichola Lowe, Harvey Goldstein, and Mary Donegan, “Patchwork Intermediation: Challenges and Opportunities for Regionally Coordinated Workforce Development,” *Economic Development Quarterly* 25 (2011): 158-171.

118. Rachel Feintzeig, "Recruiting Tech Talent in High School," *Wall Street Journal*, October 1, 2013.
119. The "M-Powered" program is a collaborative training partnership housed at Hennepin Technical College that brings together workforce development organizations, education and training providers, and firms from across the region.
120. For a review of the federal role in STEM education, see the corresponding section of National Science and Technology Council, "Federal Science, Technology, Engineering, and Mathematics Education 5-Year Strategic Plan" (Washington: Executive Office of the President, 2013). For a review of previous studies on the subject, including an accounting of spending, see Jeffrey Kuenzi, "STEM Education: Background, Federal Policy, and Legislative Action" (Washington: Congressional Research Service, 2008).
121. The \$4 billion estimate of federal STEM education and training expenditure is from Rothwell, "The Hidden STEM Economy." For a complete review of agency STEM-related programming, see Appendix Table A4 in National Science and Technology Council, "Federal Science, Technology, Engineering, and Mathematics Education 5-Year Strategic Plan."
122. See Rothwell, "Hidden STEM Economy."
123. National Governors Association, "America Works: Education and Training for Tomorrow's Jobs—An Action Guide for Governors" (Washington: 2014).
124. See [www.driveto55.org](http://www.driveto55.org) and *ibid*.
125. For details on each initiative, visit the State of Washington's Workforce Board's "High Skills, High Wages Strategic Fund" website at [www.wtb.wa.gov/HSHWStrategicFund.asp](http://www.wtb.wa.gov/HSHWStrategicFund.asp) and read more about the State of Tennessee's Skills Gap Grant, a program under the Labor Education Alignment Program (LEAP) initiative, at <http://driveto55.org/initiatives/tennessee-leap/>.
126. Maryland Department of Labor, Licensing, and Regulation "The EARN Maryland Program: Maryland's New Workforce Training Initiative" (website), available at [www.dlcr.state.md.us/earn/](http://www.dlcr.state.md.us/earn/).
127. Muro and others, "Drive!"
128. Krista Mattern, Jessica Marini, and Emily Shaw, "Are AP Students More Likely to Graduate from College on Time?" (New York: College Board, 2013).
129. Raj Chetty, John Friedman, Jonah Rockoff, "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates," *American Economic Review* 104 (2014): 2593-2632; Raj Chetty, John Friedman, and Jonah Rockoff, "Measuring the Impact of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," *American Economic Review* 104 (2014): 2633-2679.
130. James Heckman, "Schools, Skills, and Synapses," *Economic Inquiry* 46 (3) (2008): 289-324; Timothy Bartik, "From Preschool to Prosperity: The Economic Payoff to Early Childhood Education" (Kalamazoo, MI: Upjohn Institute, 2014).
131. *Ibid*.
132. See Mark Muro and Jessica Lee, "Hubs of Manufacturing: Let's Get Started," *UpFront*, August 20, 2012.
133. As product lifecycles run their course their industries' location requirements change. Innovation often begins in diversified cities, where product and process refinement occurs through iterative interactions among innovators, suppliers, and consumers. Once product characteristics and production processes become established, production typically disperses to specialized cities without the congestion costs of the more dynamic, diversified cities. At this point, and after further standardization, production can disperse to overseas locales. See, for example, Gilles Duranton and Diego Puga, "Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products," *American Economic Review* 91 (5) (2001): 1454-1477. For thoughtful discussions of the interplay of local clustering and global siting with reference to the auto and electronics industries see, respectively, Timothy Sturgeon, Joannes van Biesebroek,

and Gary Gereffi, "Value Chains, Networks, and Clusters: Reframing the Global Automotive Industry," *Journal of Economic Geography* 8 (3) (2008): 297-321; and Timothy Sturgeon and Momoko Kawakami, "Global Value Chains in the Electronics Industry: Was the Crisis a Window of Opportunity for Developing Countries?" Working Paper 5417 (Washington: World Bank Group, 2010). See also Anne Markusen, *Profit Cycles, Oligopoly, and Regional Development* (Cambridge, MA: MIT Press, 1985).

134. Though varied terms and arguments are employed, substantial agreement exists among academic industry analysts that dense regional concentrations of firms, workers, industrial know-how, and supporting organizations can enhance the competitiveness of individual firms, regional economies, and national industries. Michael Porter and others have stressed the importance of regional industry "clusters" and argued that strong clusters foster innovation through dense knowledge flows and spillovers; strengthen entrepreneurship by supporting new enterprise formation and start-up survival; enhance productivity and employment growth in industries; and positively influence economic performance. For general reviews of the cluster literature, see Joseph Cortright, "Making Sense of Clusters: Regional Competitiveness and Economic Development" (Washington: Brookings Institution, 2006); Muro and Katz, "New Cluster Moment;" and Charles Wessner, "Growing Innovation Clusters for American Prosperity: Summary of a Symposium" (Washington: National Research Council, 2014). For their part, Pisano and Shih focus on the competitive value of local and national "industrial commons," which support firm growth and which the authors define as the sum total of the local or nationally shared know-how, competencies, and skills related to a specific technology. They note that "more often than not a particular industrial commons will be geographically rooted." See Pisano and Shih, "Restoring American Competitiveness." Similarly, Tassey, in "Rationales and Mechanisms," describes the importance the "co-location synergies" that regions offer to resident actors. Finally, the MIT Task Force on Production in the Innovation Economy focuses on the concept of "industrial ecosystems—"the territorial base of resources and relationships outside a company's four walls that it can use in the development of its business." See Berger, *Making in America*.
135. Tassey, "Rationales and Mechanisms."
136. Pisano and Shih, *Producing Prosperity*.
137. McKinsey & Co. recommends that companies take a broad "total factor performance" approach to location analysis. We would add that ecosystem benefits should be part of that. A "total factor performance" approach moves beyond simplistic assessments of local wage or transportation costs and takes into account all variables while considering how these factors might evolve over time. See Manyika and others, "Manufacturing the Future."
138. Berger, *Making in America*.
139. General Electric reached a deal in late 2014 to sell its appliance division to Electrolux, a Swedish manufacturer. Whether Electrolux adopts a similar stance to its local ecosystem remains to be seen. The University of Louisville, a partner on the microfactory, for its part, has demonstrated commitment to the facility and plans to host the microfactory alongside a complementary "learning factory" at its Institute for Product Realization once the building is complete in 2016. See Terry Boyd, "Mayor Fischer: Electrolux is Not Buying GE Appliance Division to Tear It Apart," *Insider Louisville*, September 8, 2014; Marty Finley, "Another Microfactory is Headed to U of L," *Louisville Business First*, December 4, 2014.
140. Assets include woodworking, welding, 3-D printing, computer aided milling, and several other tools. To learn more about the microfactory, visit <https://first-build.com/microfactory/> and see "Innovation Acceleration: GE Selects Louisville for First Micro-Factory," *Business Wire*, April 16, 2014; and Lyndsey Gilpin, "GE Launches 'Micro-Factory' to Co-Create the Future of Manufacturing," *Tech Republic*, April 16, 2014.
141. Microsoft will provide design and technology expertise to participants and is partnering with American Family Insurance in the endeavor. Deborah Gage, "Microsoft Ventures to Launch Accelerator for Home Automation," *Venture Capital Dispatch* (Wall Street Journal blog), June 17, 2014; "Microsoft Ventures Accelerator Seattle" website, <https://www.microsoftventures.com/accelerators/seattle/>; For an overview of the Puget Sound's growing green building and energy efficiency technology cluster, see Metropolitan Business Planning Initiative, "Innovation Meets Demonstration: A Prospectus for Catalyzing Growth in the Puget Sound's Energy Efficiency Technology Cluster" (Washington: Brookings Institution, 2011).
142. For an excellent survey of the growing embrace of corporate accelerators as a cornerstone of company innovation strategies, see "As Industry Leaders Seek Innovation, Corporate Accelerators Continue to Emerge," *State Science and Technology Institute Weekly Digest*, November 19, 2014, <http://ssti.org/blog/industry-leaders-seek-innovation-corporate-accelerators-continue-emerge>. Qualcomm and Cisco, for their parts, both have special relationships with

nonprofit San Diego incubator EvoNexus to provide seed funding for promising start-ups in selected technology areas such as connected objects, cloud computing, big data, and network infrastructure. EvoNexus' mission is to strengthen innovation in San Diego, energize the local technology environment, and accelerate the development and deployment of new technologies and business models in their industries. Qualcomm's involvement reflects a strategic decision to leverage the ecosystem to discover and hone the technologies that will drive its future growth and competitiveness. It also reflects a recognition on behalf of Qualcomm that its own competitiveness stands to be enhanced by a network of innovative, specialized companies operating in the same orbit—creating new applications for Qualcomm's technologies, demanding new functionalities that the companies can co-develop, and addressing the challenges affecting the industry as a whole. For more on the two programs visit [www.commnexus.org/evonexus/strategicfunding/](http://www.commnexus.org/evonexus/strategicfunding/). See also, "Qualcomm Labs Teams with EvoNexus to Expand Innovation in San Diego," Qualcomm Press Release, May 22, 2012; Bruce Bigelow, "San Diego's Free EvoNexus Tech Incubator Gains Qualcomm Expertise," *Xconomy*, May 22, 2012; Mike Freeman, "Cisco Joins EvoNexus for Incubator Program," *San Diego Union Tribune*, June 3, 2014.

143. Documented market failures that ensure that private firms invest too little in broader ecosystem health provide a widely recognized rationale for public-sector engagement. See the National Science and Technology Council, "A National Strategic Plan for Advanced Manufacturing" (Washington: Executive Office of the President, 2012).
144. For background on the National Network of Manufacturing (NNMI), the Energy Innovation Hubs, and the Engineering Research Centers (ERCs), see the Advanced Manufacturing Portal <http://manufacturing.gov/nnmi.html>; the Department of Energy (DOE) hub website at <http://energy.gov/science-innovation/innovation/hubs>; and the ERC site at <http://erc-assoc.org/>. See also, National Science and Technology Council, "National Network for Manufacturing Innovation," which describes the vision behind the NNMI. Note that the federal government supports a wide variety of regional research institutes and centers that focus on advanced industry-related activities, including the National Science Foundation's Industry/University Cooperative Research Centers and Materials Research Science and Engineering Centers; and the Manufacturing Demonstration Facilities sponsored by DOE and the Defense Advanced Research Projects Agency (DARPA). Portions of the Department of Defense's Manufacturing Technology (ManTech) Program employ a Centers of Excellence model that frequently concentrates basic or applied research in a particular location.
145. See, for example, Scott Andes, Mark Muro, and Matt Stepp, "Going Local: Connecting the National Labs to their Regions to Maximize Innovation and Growth" (Washington: Brookings Institution and Information Technology and Innovation Foundation, 2014).
146. For an overview of DOE's National Lab Impact Initiative, see "National Lab Impact Initiative" PowerPoint presentation (Washington, DC: Office of Energy Efficiency and Renewable Energy, April 1, 2014). For a review of the USPTO's satellite office program and its site selection criteria, which included industry alignment; cluster breadth, depth, and diversity; and projected economic impact, see Michelle Lee, "Report on Satellite Offices" (Washington: U.S. Patent and Trademark Office, 2014).
147. A number of states have moved to strengthen their manufacturing, innovation, and advanced industry ecosystems in recent years. Illinois' Innovation Network provides a platform for connecting innovative companies with each other and the resources they need to grow. It provides data on innovation trends in the state and maintains a database of resources for firms, including funding and capital sources, physical space such as incubators and co-working spaces, R&D service providers, and industry associations. Washington has embedded industry involvement throughout its workforce training system. The state maintains 10 industry-specific workforce centers of excellence strategically located throughout the state that work with employers to coordinate curriculum statewide, serve as central points of contact, monitor industry trends, and offer fast, flexible, and customized training. Colorado is currently conducting a thoroughgoing assessment of its advanced industry base to identify convergence clusters and the cross-cutting technologies underlying the state's advantages. The exercise will inform an implementation plan or roadmapping exercise to create Colorado's Advanced Industries Manufacturing Institute, a unifying anchor institution for the state's diverse AIs. Oregon has set out to deepen its capabilities in emerging cross-cutting technologies with the Oregon Nanoscience and Microtechnologies Institute (ONAMI), which coordinates research collaborations among companies, the Pacific Northwest National Laboratory, and the state's four research universities; facilitates technology commercialization with "gap" grants to bring technologies to market; and manages shared labs and facilities for use by small businesses.
148. In its own work the Metropolitan Policy Program at Brookings has engaged with numerous metropolitan areas that have sought to develop rigorous strategies for developing advanced industry and related export specializations. A number of these strategies have emerged through the program's

Brookings-Rockefeller Project on State and Metropolitan Innovation, through which Brookings has helped metropolitan leaders adapt the discipline of private-sector business planning to the task of revitalizing regional economic development. "Ecosystem" development plays a central role in several of these plans. For example, Seattle's business plan led to the establishment of the Smart Buildings Center, a testing and demonstration facility for companies in the building automation and energy efficiency technology arenas to test, evaluate, and fine-tune their products before bringing them to market. In Syracuse and New York's Center State region, private, public, and civic actors are busy founding the "Data to Decisions Innovation Alliance" to bring together local firms and entrepreneurs in the sector and chart a roadmap for consolidating the region's burgeoning advantage, especially in defense applications. In Northeast Ohio, MAGNET, a nonprofit organization dedicated to helping local manufacturers compete and grow, delivers an array of consulting services and educational programs to small and mid-sized firms through its PRISM program. PRISM is designed to accelerate innovation and improve productivity in the region while building networks for peer learning and sustainable problem-solving. As of early 2014, PRISM had served more than 20 companies and directly led to more than 100 new jobs. Beyond business planning, a manufacturing strategy in Newark has resulted in the establishment of the New Jersey Innovation Institute at the New Jersey Institute of Technology. The institute provides R&D services for local industry and links businesses to the innovation assets in the region. It has also catalyzed initiatives to link small suppliers with Rutgers' Industrial Solutions Center. The ecosystem also features prominently in several related export-promotion initiatives that cities and metropolitan areas are developing in concert with Brookings. Leaders in the Louisville-Lexington region of Kentucky launched a comprehensive export plan in early 2014 to instill exporting in the business culture of the 22-country region. By the end of June 2014, the economic partnership had registered 445 success stories, defined as instances of new companies exporting, existing exporters expanding sales or expanding to new markets.

149. This point reflects Michael Porter's discussion of the proper character of public policy to support regional industry clusters. In "Clusters, Convergence, and Performance," p. 35, Delgado, Porter, and Stern write: "Effective regional policy should prioritize complementarities across related economic activity rather than seek to attract any [single] type of investment, offer incentives to benefit a small number of firms, or favor particular high-technology fields such as biotechnology or software if the regional has little strength in those areas."
150. The federal grant in question was the Economic Development Administration's i6 Green Challenge Grant, awarded to the Washington Clean Energy Partnership Project in 2011 to build a facility for energy-efficient building technologies testing and demonstration, among other projects, as initially outlined in the Metropolitan Business Plan developed in collaboration with Brookings. See Metropolitan Business Planning Initiative, "Innovation Meets Demonstration." For progress on the initiative, see the Puget Sound Regional Council and also the resulting Smart Buildings Center websites at <http://www.psrc.org/econdev/programs/smart-buildings/> and <http://www.smartbuildingscenter.org/>.
151. To learn more about Partners for a Competitive Workforce, see [www.competitiveworkforce.org](http://www.competitiveworkforce.org). The National Fund for Workforce Solutions also profiles PCW and its successes here: <http://nfwfsolutions.org/regional-collaboratives/partners-for-competitive-workforce>.
152. The Philadelphia Industrial Development Corporation's "An Industrial Land and Market Strategy for the City of Philadelphia" and "The Lower Schuylkill Master Plan" document the dynamics affecting urban real estate markets today and demonstrate how the most forward-thinking cities are reconsidering their zoning and land use patterns to reflect changes in the economy, including the increasing variety of sites that firms demand and their complementary activities.
153. Katz and Wagner, "Innovation Districts." In Boston, for example, the mayor's office was instrumental in establishing the Seaport/South Waterfront as an innovation district and played an active role in establishing District Hall, a dedicated civic space for idea exchange and collaboration at the heart of the district. For more on this trend, see Ania Wieckowski, "Back to the City," *Harvard Business Review* (May 2010); Richard Florida, "Startup City: The Urban Shift in Venture Capital and High Technology" (Toronto: Martin Prosperity Institute, 2014).
154. Katz and Wagner, "Innovation Districts."

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### ADVANCED INDUSTRIES SERIES

This paper is part of the Brookings Metropolitan Policy Program's Advanced Industries Series, which is aimed at describing and advancing the country's R&D- and knowledge-intensive advanced industries. The series provides groundbreaking research focused on assessing the large role these industries play in delivering regional and national prosperity and providing recommendations to enhance U.S. competitiveness in the sector. The sector's competitiveness and growth are prerequisites for any future broadly shared prosperity.

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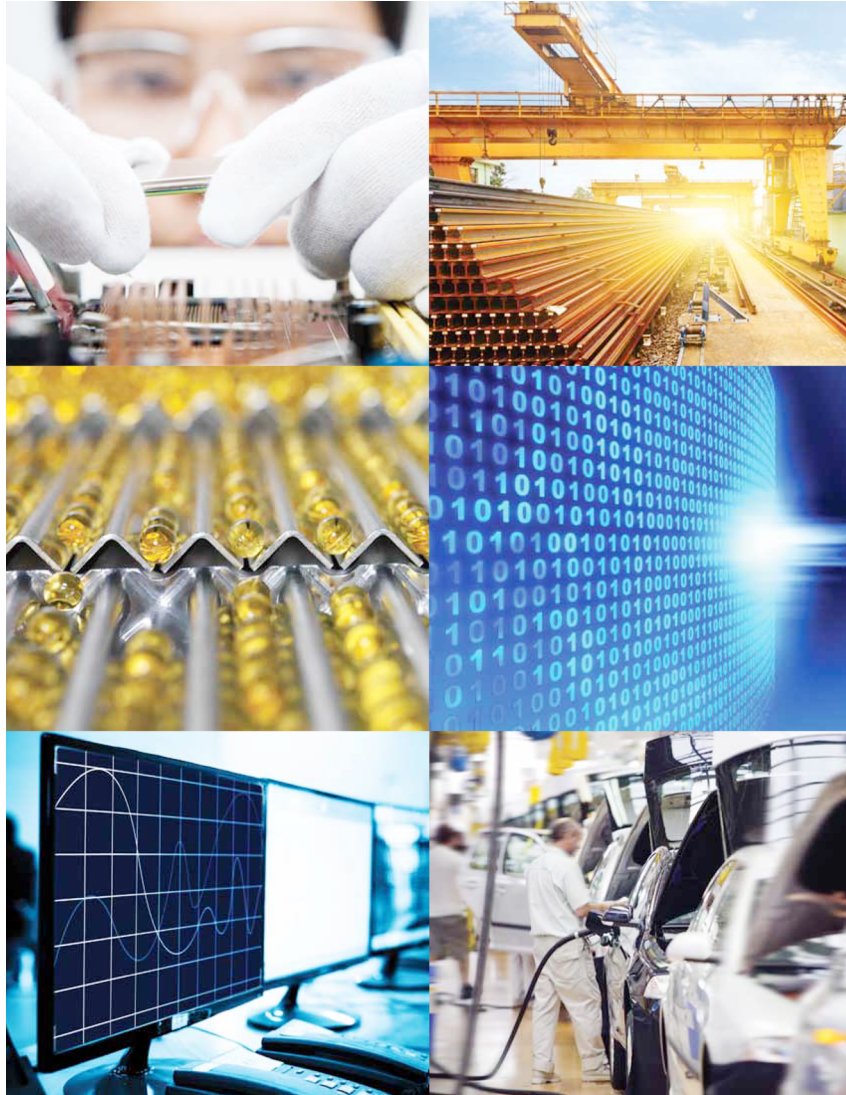
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# BROOKINGS

The Avenue

## Reshoring: Why It's Not Easy

Mark Muro and Siddharth Kulkarni Friday, October 3, 2014

**Y**esterday one of us said he thought the macro conditions for the “reshoring” of significant advanced industrial production were right but that the opening of new plants wouldn’t be easy.

A lot has happened since the United States was a colossus of industry. Regional economic ecosystems matter, yet much has been lost over 30 years in the way of local know-how, worker skills and supply chain capacity. One result is that a number of high-profile reshoring have either been difficult (GE’s return to Appliance Park in Louisville) or unsuccessful (Google and Flextronics’ effort to assemble the MotoX smartphone in Fort Worth). In these cases the erosion of the local knowledge, skills and supplier base has greatly complicated the scale-up of returning firms.

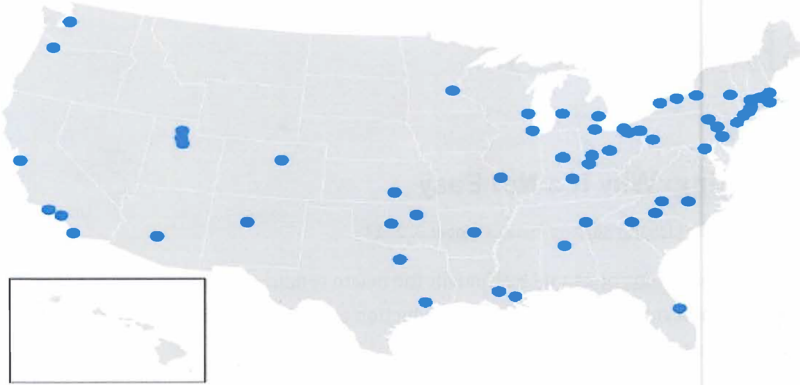
Yet that is a qualitative assessment. Can we make the point in sharper terms? In fact we can, using data from a forthcoming analysis of the geography of America’s R&D- and STEM worker-intensive “advanced industries,” which range from aerospace and automotive manufacturing to software and other high-tech services. Check out these maps:

### Large U.S. Metropolitan Areas with Over 10 Percent of Total Employment in Advanced Industries

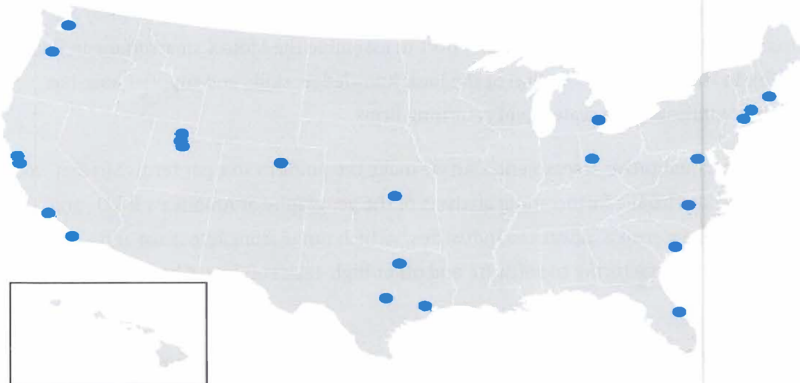
1980

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Reshoring: Why It's Not Easy



2013



*Source: Brookings Analysis of Moody's Data*

These maps, while not a perfect depiction of the condition of regional advanced industry ecosystems, provide an indication, and it's not encouraging.

In 1980, 59 of the country's 100 largest metropolitan areas had at least 10 percent of their workforce in innovative, technical advanced industries. By 2013, only 23 major metros contained such sizable concentrations of advanced industry activity. Granted, technological change and productivity increases explain some of this reduced intensity, but that's not the full story. Other countries that have been the recipients of U.S. offshoring have grown employment in these sectors substantially. All of which suggest that the American advanced industry platform has thinned out substantially and inordinately, so that less than half as many large metro areas have the density of advanced industry activity that they had in 1980. That means that on balance many fewer U.S. metropolitan areas now have the dense supplier bases and deep pools of technically relevant workers necessary to support new advanced industry growth.

That's a problem. In an era when clustered capabilities matter as much as labor or energy costs, the United States has a lot of work to do to rebuild its network of regional industrial ecosystems. Whether it can manage that will determine a lot about how the reshoring opportunities plays out, metro area by metro area.

# BROOKINGS

The Avenue

## Is America's Seed Fund investing in women- and minority-owned businesses?

Sifan Liu and Joseph Parilla Tuesday, June 4, 2019

Last month, Sen. Marco Rubio convened a reauthorization hearing for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, which he described as “programs that provide needed investment in America’s most innovative small businesses.”

Indeed, these rarely discussed programs are a critical component of the nation’s effort to reignite lagging business dynamism. SBIR/STTR grants are designed to stimulate the commercialization of technological innovation via small businesses, or companies with fewer than 500 employees.

Research shows SBIR/STTR grants play a critical role in translating research and development (R&D) into commercially successful companies that would not happen otherwise. As Joseph Shepard and John Williams, the current Small Business Administration (SBA) Associate Administrator and the SBA Director of Innovation and Technology, respectively, stated in their testimony, “The SBIR/STTR program provides approximately \$3.5 billion per year in funding to small businesses, making it the *largest single source of non-dilutive, early-stage, high-risk funding*.”

Raising seed funding from traditional venture capital investors has gotten more difficult in recent years, especially for startups outside traditional tech hubs and those with female or minority founders. By contrast, SBIR/STTR funding is subject to a clear mandate in the Small Business Act to support the participation of women, socially/economically disadvantaged individuals, and small businesses in underrepresented areas, typically rural states.

SBIR/STTR grants could, in theory, provide critical initial investment for many communities outside the large investment hubs and/or disadvantaged high-tech entrepreneurs who struggle to access private capital. But is America's Seed Fund meeting these goals, in practice? To answer this question, we explored the distribution of grant awards from 2005 to 2017 using the [SBIR/STTR award database](#).

**The SBIR/STTR program invests in more diverse communities than private venture capital.**

SBIR/STTR funds reach a much wider set of U.S. communities than traditional venture capital. Table 1 shows that the largest 100 metropolitan areas captured 78% of total SBIR/STTR funding, and smaller metropolitan areas received another 19%. Micropolitan and rural areas received a little over 3% of all SBIR/STTR funds. As a comparison, more than 80% of private venture capital investment in 2017 landed in five metropolitan areas (San Francisco, New York, Boston, San Jose, and Los Angeles).

Of course, larger metro areas have more people and companies to attract investment. Controlling for the size of regional economies, smaller metro areas punch above their weight. On average, smaller metro areas, those with populations between 50,000 and 500,000 people, receive 16% more funding per 1,000 workers than the largest 100 metro areas. This result is largely driven by college towns or military bases such as Boulder, Colo., Ithaca, N.Y., State College, Pa., Blacksburg, Va., and Huntsville, Ala.

TABLE 1

**SBIR/STTR award distribution, by metro area category, 2005 - 2017**

	Share of total awards	Share of total grant investment	Number of awards per 1000 workers	Total grant amount per 1,000 workers (thousand dollars)
Largest 100 metro areas	77.0%	78.3%	0.7	\$281.0
Small metro areas	19.5%	18.5%	0.9	\$326.9
Micropolitan and rural areas	3.6%	3.2%	0.2	\$57.1

Source: Brookings analysis of SBIR/STTR award database

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### Female and minority-owned business owners remain underrepresented in SBIR/STTR awards.

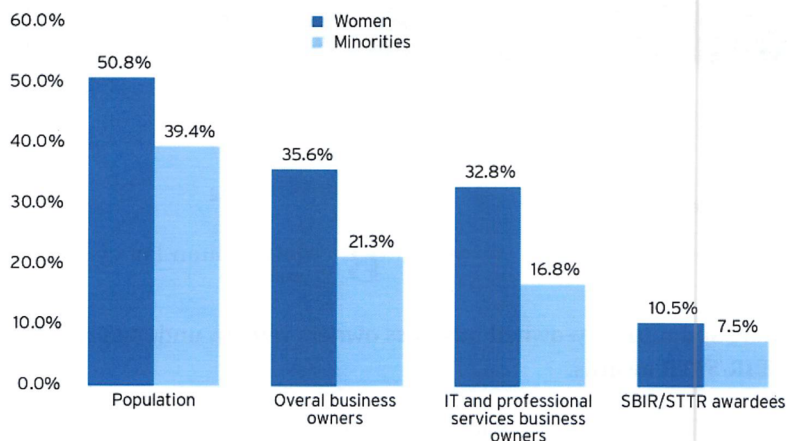
The SBIR/STTR program's record supporting diverse founders remains subpar. The federal government tracks if an awarded business is owned by a woman or a person from a socially disadvantaged group.<sup>[1]</sup> The percentage of SBIR/STTR grants awarded to female business owners rose slightly between 2005 and 2017, from 8% to 11%, but the share awarded to socially or economically disadvantaged business owners remained essentially flat at 8%. These shares are considerably lower than female and minority shares of population and business owners generally (Figure 1). Private venture capital investors, on the other hand, have actually increased their investment in female-founded startups from 7% to 21% during the same period, although investment in black startups remains at 1%.

7/2/2019

Is America's Seed Fund investing in women- and minority-owned businesses?

FIGURE 1

**Population and business ownership share of women and minorities**  
United States, 2016



Source: Brookings analysis of American Community Survey 2016 1-year estimates, Annual Survey of Entrepreneurs 2016, and SBIR/STTR award database

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These patterns vary across metro areas, however. Female-owned companies received the highest share of SBIR/STTR grants (more than 20% from 2005 to 2017) in Colorado Springs, Colo., Gainesville, Fla., Providence, R.I., Orlando, Fla., and Boulder, Colo. In contrast, female-owned companies received less than 5% of grants in Houston, Madison, Wis., Dayton, Ohio, Seattle, and Worcester, Mass.

Lincoln, Neb., Oxnard, Calif., Burlington, Vt., Phoenix, Ariz., and Chattanooga, Tenn. are among the handful of places where the share of socially or economically disadvantaged SBIR/STTR awardees surpassed the region's minority population share (Map 1). In Winston-Salem, N.C., Greenville-Anderson, S.C., Ogden-Clearfield, Utah, Rochester, N.Y., Detroit, and Portland, Ore., the minority share of SBIR/STTR awardees is less than one-tenth their share of total population.

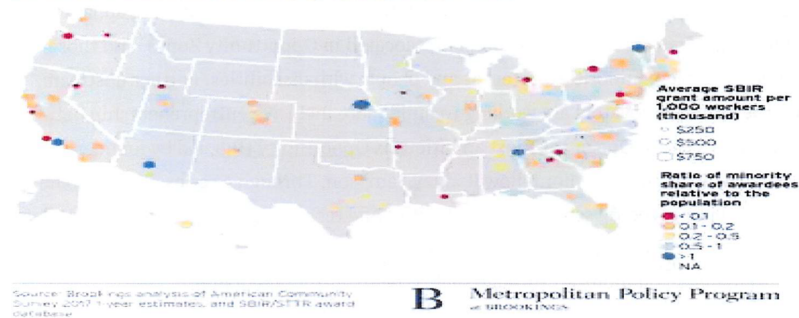


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Is America's Seed Fund investing in women- and minority-owned businesses?

MAP 1

SBIR/STTR award distribution, by metro, 2005 - 2017



**Innovation-based economic development approaches must intentionally address the racial and gender inequities that are calcified into the innovation economy.**

Further research will need to explore the source of demographic variation in SBIR/STTR grant awards across communities. But it is clear that the way in which American entrepreneurs access public and private capital is powerfully shaped by who they are and where they live. Affirming this finding, recent [research](#), led by Alex Bell and Raj Chetty, reveals that the U.S. economy draws on a relatively narrow slice of its population to fuel new innovations. Bell and Chetty argue that including more talented young people from a more diverse range of communities, genders and ethnicities in the innovation economy is not only socially just, but has great potential to expand the nation's overall rate of innovation.

The SBIR/STTR program is not the only tool available to boost innovation by closing disparities in access to seed capital. In 2010, the SBA launched the Federal and State Technology (FAST) Partnership Program. This on-ramp program offers one-year funding to local economic development organizations, incubators, universities and small business centers to support services for structurally disadvantaged business owners that help connect them to SBIR/STTR programs. But it only provides about \$3 million in support per year.

Local and state leaders clearly have a role to play as well, both related to the SBIR/STTR program and beyond. [Launch Tennessee](#), a state SBIR/STTR grant matching apparatus, offers a higher matching rate for companies located in Opportunity Zones, and those owned by women, minorities, veterans and people with disabilities. Further upstream, countless local innovators are working to build more inclusive entrepreneurship networks in America's cities. One of the most ambitious is [Opportunity Hub](#), led by founder and Brookings nonresident senior fellow Rodney Sampson. Through a series of partnerships with incubators, coding schools, municipalities and tech companies, Opportunity Hub has built a network that engages 15,000 individuals in an effort to build multi-generational wealth in black communities through high-growth entrepreneurship.

Matching these robust, diverse entrepreneurship networks with federal investment is a critical step to ensuring America's venture arm seeds inclusive opportunity.

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[1] We exclude from the analysis the 5.8% of companies that did not report demographics of the owner, which amounts to 5.2% of total funding. A woman-owned small business is defined as one that is at least 51% owned and controlled by one more or women. A socially and economically disadvantaged small business is one that is 51% or more owned by a one or more disadvantaged persons, which is defined as a member of any of the following groups: black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, other groups designated from time to time by the Small Business Administration (SBA) to be socially disadvantaged, and any other individual found to be socially and economically disadvantaged by SBA pursuant to Section 8(a) of the Small Business Act, 15 U.S.C. ; 637(a). For more information on this definition, contact the SBA.

**Senate Committee on Small Business and Entrepreneurship Hearing  
June 26, 2019  
Follow-Up Questions for the Record**

**Questions for Mr. Joseph Shepard**

***Questions from: Chairman Rubio***

**Administration's SBIC Subsidy Modeling**

**QUESTION 1: In your written testimony, you state that an updated model for projecting SBIC subsidy costs will include new assumptions like "macro-economic factors," "private equity elements," and "private equity fund characteristics". What will these assumptions include?**

- The SBIC debenture credit subsidy model is designed to estimate future cash flows associated with SBA's SBIC debenture program. These cash flows allow SBA to determine program budget requirements in compliance with the Federal Credit Reform Act – specifically, to generate credit subsidy rate formulation estimates and re-estimates – as well as to perform policy and program analysis.
- The model uses an econometric approach to estimate the probability of a terminal loan event, default or prepayment, for outstanding SBIC debenture leverage. The econometric equations include variables that historically have been highly correlated with SBIC performance and, through robust testing, SBA believes including these variables will enhance the accuracy of model forecasts. For example, changes in the national unemployment rate are predictive in forecasting SBIC program defaults. Variables in the econometric equations are meant to capture dynamics of the business, private equity, and credit cycles, all of which are relevant to performance in the SBIC program. SBA can continue to brief the committee and your staff if additional information or detail is requested.

**QUESTION 2: In developing your model, have you considered the shortfalls of equity valuation methods like the Capital Asset Pricing Model, or others that are commonly used in private markets, in undervaluing the development of long-term innovative products?**

- The Capital Asset Pricing Model (CAPM) and other similar equity valuation methods are not applicable to SBA's SBIC debenture subsidy model. CAPM is typically used to calculate the risk of an asset relative to the public market.
- SBA's SBIC debenture credit subsidy model is designed to calculate the subsidy cost of a cohort of loans by projecting lifetime program cash flows as required under the Federal Credit Reform Act. The model is designed to capture factors meaningful in forecasting cash flows to and from the SBA, including fees, defaults, and recoveries.

**QUESTION 3: Is the inclusion of these assumptions required by the Federal Credit Reform Act? Have they been required by the Office of Management and Budget?**

- The incorporation of meaningful econometric factors into the SBIC Debenture credit subsidy model is consistent with the January 2013, Office of Management and Budget (OMB) Circular A-129, and the Statement of Federal Financial Accounting Standards 18 and 19. The SBIC program operates in a private equity environment that merits the use of specific private equity variables

for modeling purposes, pursuant to OMB and FASB guidance. SBA complies with OMB guidance by seeking to improve its modeling. The outcome of this SBA-initiated process was in part new model assumptions used in estimating costs per FCRA.

**Question from: Senator Booker**

**SBIC Licensing Delays**

*Four metropolitan areas in three states—the San Francisco Bay Area, New York City, Boston, and Los Angeles—receive nearly three-quarters of all venture capital investment—the lifeblood of a high-growth startup. To bridge the gap between investors and small business owners across the country, Small Business Investment Companies (SBICs) have brought billions of financing dollars a year to small businesses seeking startup funding. Despite the critical role that SBICs play in increasing access to capital, SBICs have faced a number of obstacles at the Small Business Administration's (SBA) Office of Investment and Innovation.*

**QUESTION 1:** As you know, a number of SBICs have raised concerns regarding roadblocks faced at the SBA, particularly around the significant delays they are facing throughout the licensing process. What steps is the Office of Investment and Innovation taking to address these concerns, and to ensure that small businesses, particularly those that are rural, minority-owned, or otherwise with limited access to capital, can continue to find funding through SBA-licensed funds?

- SBA seeks continuous development, where possible, to improve processes and policies in the licensing process. This includes the improvements made to the technology platform, which will enable SBA from a single platform to effectively and efficiently manage the licensing process as well as the entire life cycle of an SBIC. This in turn, will reduce the burden on applicants and existing funds.
- SBA remains committed to ensuring all small businesses (including those that are rural, minority-owned, or otherwise have limited access to capital) have access to capital through the SBIC program. It is important to note that individual SBICs make decisions about which small businesses they invest in. SBA's outreach and education activities have sought to increase SBIC applications from underrepresented areas. Activities have included conducting Community Development Workshops and presenting at professional conferences. The Community Development Workshops are typically held in conjunction with representatives from USDA, Comptroller of the Currency, Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve to provide greater understanding of the Community Reinvestment Act and encourage investments in SBICs from regional and local financial institutions. Workshop locations have been conducted in North Carolina, Maine, Arkansas, and Oklahoma. Conference presentations include engagement with community bankers, financial institution CFOs, and agricultural/rural bankers in collaboration with the American Bankers Association.
- In addition, SBA formally implemented a priority in licensing for SBIC applicants pursuant to the Spurring Business in Communities Act of 2017 (P.L. 115-333) by Policy Memorandum on September 10, 2019. That policy notice provides first priority in the SBIC licensing queue to applicants from "underlicensed states" with below median financing, as required by the Act.

*Questions from: Senator Hawley*

*The SBIC program is built upon several layers of protection for taxpayers. This has allowed the program to remain subsidy-free while helping to create millions of jobs.*

*A major reason for this success is that the Office of Investment and Innovation has managed an SBIC license application process that reflects a proper level of due diligence. For example, foremost among the criteria for licensure is qualified fund management. OII reviews and approves a prospective SBIC's management team based on several factors, including having at least two principals with substantive and analogous principal investment experience, having realized track record of superior returns, managerial, operational, or technical experience, and more. The process also includes an extensive Management Assessment Questionnaire (MAQ), payment of fees, training seminars, in-person interviews, and significant capital requirements.*

**QUESTION 1:** The program has been working, and working well, for decades. If the changes you have made, and the resulting decrease in licensures and increased application times, are about due diligence, where's the evidence that the processes that were in place before you were inadequate?

- The number of SBIC licenses issued had been declining each fiscal year from 2013 to 2016, with a cumulative decline during the period of 38.2%. The downward trend continued in FY 2017. However, in comparison to SBIC licenses issued in FY 2017, there was a 66.7% increase in FY 2018 and a 20.0% increase in FY 2019.
- SBIC license application or processing times have decreased 7.1% when comparing FY 2017-FY 2019's average processing time of 6.7 months to FY 2014-FY 2016's time of 7.2 months. FY 2017-FY 2019's improved average processing time of 6.7 months has also decreased 11.1% in comparison to the eight year average from FY 2009-FY 2016 of 7.5 months.
- In regards to SBIC program processes, SBA seeks to make select process improvements. Several of the processes, workflows, and systems used by the SBA to oversee the SBIC program were established in the 1994 period at a time when the Total Capital at Risk in the SBIC program (FYE 09/30/94, \$805.5M) was 37.96 times smaller than the size and associated activity level of the present day program (06/30/19, \$30.5752B). As a result, many of the processes discussed herein have demonstrated inadequacies by remaining static in a dynamic environment characterized by several factors such as expanded activities and exponential growth.
- The SBIC program's information collection process occurs through the SBIC WEB data collection system, which provides for timely filings by SBICs of their financial and operating activities. Verification that the information collection processes were deficient was determined after a FY 2017 review by the Office of the Chief Information Officer (OCIO). As a result, the 2013 legacy SBIC WEB data collection system and its associated processes were transitioned to the OCIO for process improvement and replacement.
- The processes associated with the 1994 legacy SBIC program information system (which involves information collection, storage, protection, retrieval, transmission, and reporting) were determined in a FY 2017 review to be fragmented and misaligned with other processes, workflows and systems associated with the SBIC program's sub-offices. Since the system was introduced 26

years ago, there has been little to no digital transformation to automate manual processes. This process limited data sharing and connectedness between sub-offices where data is stored in a variety of static spreadsheets, databases, digital, and paper files. As a result, employees are engaging in repetitive and time consuming manual processes that increase employee work loads. Process improvements and information technology modernization will occur as a result of the September 2018 procurement of a new information system that is currently being customized for implementation in FY 2020.

- In regards to paper files, prior to FY 2017, the records management process of converting paper files into electronic records had been lacking or non-existent for many years. The process deficiency impacted multiple sub-offices resulting in delays locating select files in an efficient manner. A remedy to the deficiency was implemented in FY 2018 and completed in October 2018.
- Furthermore, the SBA is enhancing the SBIC program's information technology processes through compliance with the following: President's Management Agenda; Modernizing Government Technology Act; Evidence-Based Policymaking Act; Federal Data Strategy; Cloud Smart; Transition to Electronic Records (OMB/NARA M-19-21); 21st Century Integrated Digital Experience Act; and OPEN Government Data Act.
- SBA is mandated to examine all SBICs at least every 2 years, which is a requirement of Section 310(c) of the Small Business Investment Act of 1958. The activity is performed by the Office of SBIC Examinations (OSE). Confirmation that inefficient processes existed within OSE was the resulting steady annual decline in the number of SBIC examinations and the increase in the time it took to conduct an SBIC examination each year. For example, the number of examinations conducted had declined during the past fiscal years prior to FY 2017. Prior to FY 2017, it was also taking twice as long to examine an SBIC as it took in FY 2013. The result was an inability to examine all SBICs at least every 2 years. Change was required because these challenges increased the risk that SBA could not detect fraud, abuse, or illegal activities in a timely manner, as well as the risk of noncompliance with regulations and SBA's statutory requirements. Moreover, the SBA IG's 09/30/13 Audit Report Number 13-22 had already identified deficiencies in the management of the SBIC examination process. The IG's Report indicated a concern that the significant decrease in examination reports with findings may indicate that the quality of assessments has suffered and that examiners are not identifying all findings. The IG's conclusion was that improved examination quality can strengthen SBA's oversight of SBICs. Accurate and timely SBIC examination data is essential for SBA's credit decisions associated with SBICs. Therefore, process improvements associated with SBIC examinations were initiated in FY 2017.
- In regards to the maturing investment portfolio, SBICs licensed since FY 2009 are starting to mature. If an SBIC is going to have issues, SBA typically starts seeing signs of problems approximately 7 to 10 years after licensing, since the first 5 years are typically spent investing in small businesses, with the next 5 to 10 years exiting the investments. If the investments don't achieve positive returns, then this leads to losses in the SBIC's portfolio later in the SBIC's lifecycle. During FY 2019, financial and regulatory problems were found in some of these maturing SBICs. As a result, during FY 2019, SBA transferred four Debenture SBICs to Liquidation with SBA-guaranteed Debenture leverage totaling \$178.7M, which is the largest single fiscal year transfer

of Debenture leverage in the history of the SBIC program. Additionally, one of the Debenture SBICs transferred to Liquidation had Debenture leverage totaling \$148.0M, which is the largest Debenture SBIC transfer to Liquidation in the history of the SBIC program.

- The processes for managing a Federal credit program, like the SBIC program, are prescribed in OMB's January 2013 Circular A-129 and include budgeting for subsidy costs and minimizing unintended costs to the Government. As of FY 2017, the subsidy process was considered insufficient because SBA had not substantially updated the SBIC program's subsidy cost model since its creation. The growth of the program, the changing nature of the private equity landscape, and unpredictability of the broader financial markets all indicated model updates were appropriate in light of A-129 guidance.
- Additionally, OMB circular A-129's processes include protection of Government assets and minimizing losses and taxpayer risk. However, as of FY 2017, several SBA processes were lacking or non-existent in regards to implementing A-129 processes and procedures.
- In addition to seeking to be compliant with A-129, additional considerations for SBA's focus on improving risk management have been proactive responses to the SBIC program's growth, maturing portfolio, and investment type.
- In regards to the SBIC program's growth during the past 10 years, SBA Debenture Capital at Risk (taxpayer backed SBA-guaranteed Debenture leverage and Debenture commitments) grew at a compound annual growth rate of 13.17% increasing by 3.45 times from \$4.1179B as of 07/01/09 to \$14.1938B as of 06/30/19. In FY 2018, for the first time, the SBIC program surpassed \$30 billion in private, outstanding and committed SBA-guaranteed capital and as of 06/30/19 was at an all-time high of approximately \$30.5 billion. As the program continues to grow, it is essential that the processes and technology continue to become more effective and efficient.
- In regards to investment type, the supply and demand characteristics of the private capital markets plays a significant role in the investment types and amounts of capital and loan funds SBICs provide to small businesses. As of 06/30/11, only 11.71% of Debenture financing dollars were concentrated in equity investments during the fiscal year. Eight years later, as of 06/30/19, the equity investment percentage during the fiscal year had more than doubled to 23.14% in equity investments, which pose more risk to the SBA.
- SBA is committed to A-129 compliance and to making certain that the processes associated with risk management will ensure that the taxpayer assets under SBA stewardship are adequately protected.

*A major complaint from the SBICs is the time it is taking to process applications, schedule interviews and classes, and even doing something as simple as actually sending the license to the applicant once they have been approved. This is the result of one of three causes: insufficient staffing, incompetent staff work, or mismanagement.*

**QUESTION 2: How many total staff are there in the Office of Investment and Innovation?**

- The Office of Investment has 75 employees.

**QUESTION 3: How many staff vacancies are there currently in OII?**

- The Office of Investment is 95% occupied. There are four open positions resulting from retirements, reassignments, or resignations.

**QUESTION 4: How long has each position been vacant?**

- One position became vacant in December 2019. The other three have acting leadership, but are listed as vacant until a permanent hire is made.

**QUESTION 5: How many of the vacancies are senior management positions?**

- One

**QUESTION 6: How long has each position been vacant?**

- See response to question 4.

**QUESTION 7: Why haven't you filled these positions?**

- SBA is in the process of filling the remaining vacancies.

**QUESTION 8: Your office does not provide applicants whose licenses are rejected an explanation for the decision. You do not give applicants who are rejected an opportunity to fix or amend their application and pursue reconsideration. After applicants have spent countless hours and tens – if not hundreds – of thousands of dollars, not to mention raising millions in private capital, seeking a license you don't give them the courtesy of an explanation or the opportunity to fix their application?**

- Since January 2017, all applicants who were denied an SBIC license were provided with an explanation as to why their application was denied. SBA makes a concerted effort to work with applicants that were denied a license to fix or amend their application, and pursue reconsideration. Since January 2017, SBA has worked with applicants to subsequently issue 9 SBIC licenses to SBIC applicants that were initially denied.
- Under the current Licensing SOP, SBA notifies all denied applicants of its decision via a denial letter or phone call, depending on the licensing stage at which the applicant is denied. The Licensing SOP also provides an opportunity for applicants to withdraw their application under appropriate circumstances. In practice, the Licensing Committee seldom issues denial letters for a very simple reason: applicants often don't want them. For example, publicly-traded Business Development Companies would be required to report any such SBA denial letter to shareholders, with



potentially damaging impact on their publicly traded stock price. For private funds, such letters could be required to be disclosed to Limited Partners for a variety of reasons, including as part of the responsibilities applicable to the General Partner or under the terms of written agreements between the parties. Most denials relate to significant, unflattering shortcomings involving the General Partner team, such as poor investment track record or poor character. In the past, there have also been issues relative to personal federal bankruptcy filings, undisclosed arrest records, and outstanding state and federal tax-liens that have resulted in denials. General Partners understandably do not want these issues addressed in writing. In every single instance of a denial by the Agency Licensing Committee, the Chief of Licensing has personally called the SBIC applicant and communicated the decision and its underlying reasons directly to the applicant's management team. These discussions are often quite lengthy and may involve multiple calls. The Chief of Licensing has also communicated via email and/or in-person meetings as required or requested.

**QUESTION 9: Does this seem right to you?**

- Please see the response above.

**QUESTION 10: Have you ever denied, delayed, or in any way obstructed the issuance of an SBIC license as a form of punishment or reprisal against the applicant?**

- No.

*In December 2018, Chairman Rubio's "Spurring Business in Communities Act" became law. This bill gives first priority to SBIC applicants located in under-licensed states, like Missouri, and removes certain capital requirements to make it easier for applicants from underserved states to participate in the program.*

**QUESTION 11: What have you done to implement this law?**

- Implementation has occurred. SBA formally implemented a priority in licensing for SBIC applicants pursuant to the Spurring Business in Communities Act of 2017 (P.L. 115-333) by Policy Memorandum on September 10, 2019. The policy notice regarding "Underlicensed States" was effective immediately upon issuance and provided guidance to all potential applicants to the SBIC program, including applicants in the SBIC licensing queue.

**QUESTION 12: What are your plans for this year?**

- In FY 2020, SBA plans to coordinate outreach and awareness with SBA Regional and District Offices in the regions containing States impacted by the Spurring Business in Communities Act.

**QUESTION 13: When can I expect to see an increase in small business investment in places like Missouri?**

- The SBA does not make decisions about which small businesses receive capital from SBICs. Each SBIC decides which small businesses will receive investment capital. As a consequence, SBA officials do not direct investment into particular small businesses or geographic locations. In FY 2016, SBICs provided \$68.2 million to 17 small businesses in Missouri. By FY 2018, these numbers increased to \$108.9 million to 23 small businesses. There are currently 13 SBIC licensees headquartered in Missouri, 4 of which were licensed in FY 2018.

A series of three reports on the SBIC program were produced for the Small Business Administration by a division at the Library of Congress, the Federal Research Division (FRD). Two of the three reports are available on the SBA site:

- Paglia, John & Robinson, David T. (2017, January). "Measuring the Role of the SBIC Program in Small Business Job Creation." Federal Research Division report. Available at [https://www.sba.gov/sites/default/files/files/SBA\\_SBIC\\_Jobs\\_Report\\_0.pdf](https://www.sba.gov/sites/default/files/files/SBA_SBIC_Jobs_Report_0.pdf)
- Paglia, John & Robinson, David T. (2016, October). "Measuring the Representation of Women and Minorities in the SBIC Program." Federal Research Division report. Available at [https://www.sba.gov/sites/default/files/files/SBIC-Diversity-Report\\_0.pdf](https://www.sba.gov/sites/default/files/files/SBIC-Diversity-Report_0.pdf)

According to the Library of Congress, SBA has not made the third report public. My office made a direct request for the report to SBA and, to date, it still has not been released.

**QUESTION 14: Why has the report not been made public?**

- The report has been made public. That report can be found online at the following link:
- <https://www.sba.gov/article/2019/aug/28/measuring-role-sbic-program-financing-small-businesses>

**QUESTION 15: When will you release the report?**

- The report has been made public.

*Questions from: Senator Hirono*

**Promoting Women and Minorities as Entrepreneurs**

*Mr. Shepard, as witnesses from our second panel acknowledged in their written testimony, women and minorities face substantial challenges and barriers to accessing capital and remain severely underrepresented as both the investors and recipients of venture capital in the United States.*

**QUESTION 1: Can you elaborate on how your office—the Small Business Administration’s (SBA) Office of Investment and Innovation (OII)—has worked to address these challenges and barriers and improve access to capital for women and minorities?**

- SBA seeks to promote the SBIC program to the private equity marketplace in general and to the women and minority communities in particular. SBA has made a concerted effort to connect with women and minority fund managers to encourage them to consider participating in the SBIC program and to gain a deeper understanding of the small business challenges facing these communities. These engagement activities included: participation in affinity group conferences; visits with women and minority management SBICs; and visits with women and minority managed private equity funds unaffiliated with the SBA.

**QUESTION 2: What other steps has OII taken to promote women and minority investors and entrepreneurs?**

- On December 3<sup>rd</sup> and December 5<sup>th</sup> the SBA held two SBIC program education and awareness events at Historically Black Colleges and Universities. Those HBCUs were Jackson State University in Mississippi and Miles College in Alabama. As stated previously, SBA conducted a SBIC program

education and awareness event in early 2019 with representatives from Native American tribes in Oklahoma, which was a first for the SBIC program. SBA continues to field incoming inquiries from prospective women and minority SBIC candidates. SBA also continues to engage existing women and minority SBIC managers to explore ways to increase prospective women and minority SBIC candidates. As part of SBA's ongoing efforts to conduct outreach and awareness regarding the SBIC program, SBA will continue to coordinate and plan events with the assistance of SBA Regional and District offices.

**QUESTION 3: Do you believe OII should be doing more?**

- SBA continuously strives to enhance and improve the reach and effectiveness of the federal credit programs it manages.

**Promoting Manufacturing in Hawaii**

*Mr. Shepard, witnesses from our second panel also acknowledged the need to promote manufacturing through SBA. Locally in Hawaii we have a small but thriving manufacturing industry, which receives support from SBA resource partners and local stakeholders like the Chamber of Commerce Hawaii, through its Manufacturing in Hawaii Initiative, and INNOVATE Hawaii—the state's National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP) program center.*

*When I have met with these stakeholders they have repeatedly emphasized the need for more stakeholder "buy-in" for government programs and initiatives that support manufacturing and related industries.*

**QUESTION 4: In your opinion, what could SBA do to better support manufacturing—particularly through the Small Business Investment Company (SBIC) program?**

- The SBA does not make decisions about which small businesses or industries receive capital from SBICs. Each SBIC decides which small businesses will receive investment capital. As a consequence, SBA officials do not direct investment into particular small businesses, industries or geographic locations.

**QUESTION 5: Do you agree that stakeholder "buy-in" for these kinds of programs is important?**

- Yes.

**QUESTION 6: How could SBA encourage more "buy-in" from local stakeholders?**

- SBA already actively encourages "buy-in" from local stakeholders through regular outreach and dialogue with industry and community leaders. These outreach activities have included conducting Community Development Workshops and presenting at professional conferences. The Community Development Workshops are typically held in conjunction with representatives from USDA, Comptroller of the Currency, FDIC and the Federal Reserve to provide greater understanding of the Community Reinvestment Act and encourage investments in SBICs from financial institutions. Workshop locations have been conducted in North Carolina, Maine, Arkansas, and Oklahoma. Conference presentations include engagement with community bankers, financial institution CFOs, and agricultural/rural bankers in collaboration with the American Bankers Association

**Questions from: Senator Rosen****Vacancies**

*Small businesses are the engine of our economy. My home State of Nevada has more than 270,000 small businesses, and there are more than 30 million nationwide. The SBA is essential to small businesses in pursuit of the American Dream, and the Office of Investment and Innovation helps ensure that businesses continue to grow.*

*That is why I am concerned about understaffing at SBA and in your office. I am particularly interested to learn about staffing as it pertains to the SBIC Program. I am concerned that a large number of vacancies could possibly be contributing to administrative and licensing delays.*

**QUESTION 1: Mr. Shepard, how many vacancies currently exist at your office?**

- The Office of Investment is 95% occupied. There are four open positions resulting from retirements, reassignments or resignations.

**QUESTION 2: How long have those positions been vacant?**

- One position became vacant in December 2019. The other three have acting leadership but are listed as vacant until a permanent hire is made.

**QUESTION 3: Is there a reason why these openings have not been filled?**

- SBA is in the process of filling the positions.

**QUESTION 4: I understand that filling job openings can take time, but do you currently have a plan and timeline to ensure that these vacancies are filled?**

- Yes. SBA anticipates three of the current opening positions will be filled by the end of March 2020 and the fourth will be filled by the end of May 2020.

**Licensing of SBIC's**

*According to the SBIC Program Overview, as of March 31st, program licensing and participation are down. The number of applications received and processed are down by nearly 50 percent.*

**QUESTION 5: To what do you attribute the downward trend for program licensing in Fiscal Year 2019?**

- The SBIC Program Overview, as of 03/31/19, is only reporting on six months or half a year of data. An additional six months of licensing data is not included in the 03/31/19 SBIC Program Overview.
- In FY19 SBA approved 18 SBIC licenses. From 2013 to 2017, the average number of licenses approved had been on a downward trend. In the past three years SBA has denied fewer applicants and processed SBIC licenses faster than any other three year period after 2009. In fact, in 2017 SBA had the highest number of licensed SBICs in the last 6 years with 315.
- From a private equity industry perspective, larger non-SBIC private equity funds are being formed in the private sector and there has been some migration of managers, who were previously SBIC managers, moving to these larger non-SBIC private equity funds. SBA also believes that tightening

in the private capital markets has resulted in a reduction of the total investment dollars available to prospective candidates seeking to form a SBIC, particularly for the lower-middle market, which is the segment of the private capital market where SBICs compete.

**QUESTION 6: Why are there delays in reviewing applications?**

- SBIC license processing times have been faster since FY2017. SBIC license application or processing times from FY 2009-FY 2016 averaged 7.5 months. Processing times from FY 2017-FY 2019 averaged 6.7 months. SBA has been taking the requisite time to conduct proper due diligence and thorough analysis of applicants.

**QUESTION 7: In states that have few or no licensed SBICs, what are you doing to encourage the licensing of SBIC funds in states like Nevada?**

- SBA plans to coordinate and conduct outreach and awareness regarding the SBIC program with SBA Regional and District offices in regions containing States, like Nevada, that are impacted by the Spurring Business in Communities Act. Specific to Nevada, SBA is planning an education and awareness event regarding the SBIC program that occurred in Nevada in December of 2019.
- SBA's outreach and education activities have sought to improve SBIC applications from underrepresented areas. Activities have included conducting Community Development Workshops and presentations at professional conferences. The Community Development Workshops are typically held in conjunction with representatives from USDA, Comptroller of the Currency, FDIC and the Federal Reserve to provide greater understanding of the Community Reinvestment Act and encourage investments in SBICs from financial institutions. Workshop locations have been conducted in North Carolina, Maine, Arkansas, and Oklahoma. Conference presentations include engagement with community bankers, financial institution CFOs, and agricultural/rural bankers in collaboration with the American Bankers Association.

**QUESTION 8: What can Congress do to help?**

- OII looks forward to working with you and your staff during outreach events to encourage potential SBIC program participants to attend.

**Onboard Initiative**

*The State of Nevada has more than 70,000 minority-owned businesses and 80,000 women-owned businesses. I am also proud that Nevada has led the nation in growth of women-owned businesses over the past decade.*

*As you know, the Onboard Initiative is a partnership between the SBA and LinkedIn, and a growing number of organizations committed to addressing the lack of women and underrepresented talent in the leadership of U.S. small businesses. This initiative aims to increase the number of underrepresented groups on corporate boards and high growth small businesses, particularly those in which SBICs invest.*

**QUESTION 9: What is the progress of this initiative?**

- SBA and LinkedIn could not agree on terms regarding renewing the co-sponsorship agreement. The agreement has expired and has not been renewed.

**QUESTION 10: What are you doing to support this initiative so that other organizations can participate and promote diversity in their corporate boards?**

- See response to question 9.

**QUESTION 11: What other small business initiatives is your office currently working on to promote the participation of woman and minorities?**

- On December 3<sup>rd</sup> and December 5<sup>th</sup> the SBA held two SBIC program education and awareness events at Historically Black Colleges and Universities. Those HBCUs were Jackson State University in Mississippi and Miles College in Alabama. As stated previously, SBA conducted a SBIC program education and awareness event in 2019 with representatives from Native American tribes in Oklahoma, which was a first for the SBIC program. SBA continues to field incoming inquiries from prospective women and minority SBIC candidates. SBA also continues to engage existing women and minority SBIC managers to explore ways to increase prospective women and minority SBIC candidates. As part of SBA's ongoing efforts to conduct outreach and awareness regarding the SBIC program, SBA will continue to coordinate and plan events with the assistance of SBA Regional and District offices.



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**Senate Committee on Small Business and Entrepreneurship Hearing  
 June 26, 2019  
 Follow-Up Questions for the Record**

Questions for Professor Ozkazanc-Pan

Questions from:

Senator Hirono

Challenges Facing Women and Minorities as Investors and Entrepreneurs

Professor, given your work on diversity and inclusion, you have had an opportunity to examine some of the challenges facing women and minorities as investors and entrepreneurs.

**QUESTION 1:**

Can you elaborate on some of these challenges?

In general, these challenges can be broken down into three types for investors and entrepreneurs. While there are areas of overlap and shared barriers, there are also unique issues faced by women and minorities in regards to becoming investors versus entrepreneurs. For investors, the three types of challenges faced by women and minorities are related to *access, pipeline and advancement*. In the venture capital (VC) industry, forty percent of investors come from two universities—Harvard and Stanford—and eighty-two percent of investors are male and seventy percent are White<sup>1</sup>. Alumni networks of such elite universities including those of Ivy Leagues provide important access to information and opportunities to graduates. These affiliations and the relationships they foster create a potential barrier to knowledge and access for those with educational backgrounds outside of elite universities and alumni networks or those whose professional connections are outside of the small, private networks of the VC world. In addition to access, pipeline concerns are also important in creating potential barriers to those whose professional experiences may not match those of traditional candidates—currently, less than ten percent of decision-makers at VC firms are women and around seventy-four percent of VC firms

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<sup>1</sup> <https://blog.usejournal.com/where-did-you-go-to-school-bde54d846188>

have no female decision-makers<sup>2</sup>. Without intentional outreach, recruitment and promotion in the VC industry aimed at increasing the diversity of decision-makers, there will likely be little change in the make-up of decision-makers. Thus, creating a healthy pipeline of diverse decision-makers is essential to changing the dynamic of the investment industry<sup>3</sup> and increasing investment in women and minority-led ventures. The final barrier for investors is that of advancement—while there have been some acknowledgment and efforts to increase the diversity of investors including the 2016 Diversity Pledge<sup>4</sup> by over forty firms of the NVCA (National Venture Capital Association), change has been slow. Thus, while the industry as a whole has acknowledged the lack of diversity in its ranks, advancement for women and minority investors is still a work in progress. Given that women and minority advancement to decision-making positions requires systematic changes in the VC industry, one bright spot has been the growth of women<sup>5</sup> and minority-led<sup>6</sup> investment firms.

In terms of entrepreneurs, challenges facing women and minorities can similarly be categorized into three types: *information asymmetry*, *access to capital* and *cultural norms*. While entrepreneurial aspirations and innovative ideas can be found across the U.S., the same is not true for opportunities. Some of this is due to the fact that people tend to connect with those most like themselves in their social networks<sup>7</sup>. In addition, founding teams are generally made up of one's previous professional connections and current social networks<sup>8</sup>. The result is information asymmetry where women and minorities have little or no knowledge of opportunities for participating in start-ups founded by White males. Further, such networks can prevent women and minority entrepreneurs from connecting with much needed mentorship. Both private and publicly funded programs, such as accelerators, incubators, university entrepreneurship centers, SBA, SCORE, SBDC and others, intended to support entrepreneurs can play an important role in closing the information and knowledge gap for women and minority entrepreneurs through intentional practices (expanded upon in question 2). Second, despite the rapid growth of women<sup>9</sup> and minority<sup>10</sup> led businesses in the U.S., lack of access to capital remains one of the largest barriers to growth. The majority of women and minority-owned businesses tend to be non-employer firms. With access to capital such businesses would be able to expand and hire additional employees. In recent years, there have been opportunities to expand beyond traditional capital providers, such as banks, family firms, PE (private equity), corporate VC, and VC among others. Syndicates, crowdfunding, grants, and women and/or minority-focused funds have resulted in new opportunities for accessing capital. Ultimately, if the dynamics of the capital industry change to include more women and minority decision-makers, then it is likely more women and minority entrepreneurs will receive capital and funding opportunities. Currently, the

<sup>2</sup> <https://techcrunch.com/2018/11/04/female-founders-have-brought-in-just-2-2-of-us-vc-this-year-yes-again/>

<sup>3</sup> <https://www.knightfoundation.org/reports/diversifying-investments-a-study-of-ownership-diversity-and-performance-in-the-asset-management-industry>

<sup>4</sup> <https://nvca.org/wp-content/uploads/2016/07/Final-NVCA-Diversity-Report.pdf>

<sup>5</sup> <https://www.forbes.com/sites/kellyhoey/2018/07/12/ten-female-founded-venture-capital-funds-you-should-have-in-your-network/#75f613c47565>

<sup>6</sup> <https://kevintpayne.com/top-vc-firms/>

<sup>7</sup> McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27(1): 415-444.

<sup>8</sup> Ruef, M., Aldrich, H. E., & Carter, N. M. (2003). The structure of founding teams: Homophily, strong ties, and isolation among US entrepreneurs. *American Sociological Review*, 68(2): 195-222.

<sup>9</sup> [https://about.americanexpress.com/files/doc\\_library/file/2018-state-of-women-owned-businesses-report.pdf](https://about.americanexpress.com/files/doc_library/file/2018-state-of-women-owned-businesses-report.pdf)

<sup>10</sup> <https://www.mbda.gov/page/us-business-fact-sheets>



warm-introductions necessary to meet VCs coupled with gender-norms in entrepreneurship<sup>11</sup> create often invisible barriers to access. Finally, cultural norms and media outlets generally associate young White males with technology entrepreneurship. These representations can negatively impact the availability of diverse role models despite the foundational and important roles played by women and minorities in science and in the development of technologies<sup>12</sup>. Given the outsized importance of technology entrepreneurship in relation to VC funding, changing mindsets and stereotypes about technology entrepreneurs is crucial to funding America's next innovators (expanded upon in question 3).

## QUESTION 2:

How can we address these challenges—through the SBIC Program and otherwise?

The challenges related to representation in the investor community and in funding diverse entrepreneurs can be addressed through intentional programs. First, there must be dedicated efforts to increase diversity in investment firms—this can be achieved by creating on-ramps for women and minority investors. Examples of this include adopting the Rooney Rule/Murray Mandate for senior investment positions to ensure that diverse candidates are being interviewed. Rather than putting a quota in place, this approach expands the candidate pool and networks generally used to recruit for such top positions. Another example is recruiting women and minority professionals who have an interest in the investment industry through a dedicated outreach program. This can be expanded upon with an educational component to increase knowledge and skills of diverse individuals interested in working in the investment industry. Firms can also dedicate a portion of their funds to be used specifically for women/minority-led ventures.

In the hearing, we discussed several ideas aimed at systemic change in the SBIC program. Chairman Rubio's idea to change the requirements for SBIC applicants in order to reduce a barrier to getting an SBIC license. Also we discussed Senator Cardin's questions on the merits of creating an apprenticeship program to create a pipeline of diverse SBIC fund managers and therefore investments in diverse companies. Programs like the SBIC must promote diversity and inclusion within their own organization and consider working with a diversity advisory council to ensure that policies and practices serve all clients equally. A thorough assessment of program components, leadership and outcomes (i.e., track funding, licenses issued, etc.) can provide a baseline to assess changes going forward. Strategic partnership with organizations, such as the Toigo Foundation, HBCUs, and other diversity-focused groups nationally, can create important opportunities for recruitment of diverse fund managers in the SBIC. Licensed SBIC fund managers/firms can be encouraged to engage diverse partners in their local communities and can be connected with other fund managers in the program who, historically, have invested in women and/or minority-led businesses at higher rates in order to provide leadership and support.

<sup>11</sup> Clark Muntean, S., and Ozkazanc-Pan, B. (2015), A Gender integrative conceptualization of entrepreneurship, *New England Journal of Entrepreneurship*, 18(1): 27-40. <https://doi.org/10.1108/NEJE-18-01-2015-B002>

<sup>12</sup> <https://www.loc.gov/tr/scitech/SciRefGuides/womenminorities.html>

**QUESTION 3:**

What other solutions should we consider to address these challenges?

LPs (limited partners) are those institutions and organizations that invest large sums of money (i.e., university endowments, pensions, insurance companies, family offices, etc.) with VCs and other investors. LPs have an opportunity to be engaged in addressing the challenge of diversity: if LPs provide direction and/or requirements of investment firms to be diverse in their decision-making team and to invest across a diverse array of groups, systemic change is possible. This can be a particularly important avenue to change the dynamic of diversity in the investment world as a portion of the funds invested by LPs is public money. There could be requirements or changes to how public money is invested by LPs (i.e., size of investments) in order to ensure accountability and transparency for taxpayers.

Follow-up: I have strongly advocated for broadening participation for women and minorities in STEM, which improves our competitiveness abroad by expanding the number of qualified individuals with relevant backgrounds in STEM.

**QUESTION 4:**

Does broadening participation for women and minorities have similar benefits for entrepreneurs, who compete within the marketplace of ideas?

Yes, by broadening STEM education to include more women and minorities, there will be increased innovation and opportunities for new ideas to result in entrepreneurial ventures. Diversity provides new insights into solving existing problems and it creates new opportunities to expanding solutions to different communities. The changing demographics<sup>13</sup> of the U.S. require that we invest into the next generation of scientists, technologists and innovators who are increasingly diverse. Diversity is the future of the U.S. and it is also the future of entrepreneurship—investing in STEM education for women and minorities will allow the U.S. to stay competitive globally in terms of innovation and technology.

**QUESTION 5:**

What else can we do to continue promoting women and minority entrepreneurs?

By continuing to support national programs with local impact, such as Women's Business Centers and Minority Business Development Agency Centers, government can provide important contributions to the growth of women and minority entrepreneurs. Additionally, providing low or no-cost loans or grants to such businesses through programs that these centers facilitate or other programs can provide much needed capital infusion when traditional lenders are unavailable or unwilling to provide loans. Finally, expanding the amount of funding for programs supporting women and minority entrepreneurs can increase significantly their outreach

<sup>13</sup> <https://www.brookings.edu/blog/the-avenue/2018/06/21/us-white-population-declines-and-generation-z-plus-is-minority-white-census-shows/>

and impact. This can include WBCs/MBDACs as well as university entrepreneurship centers, accelerators, and city programs (i.e., Women Entrepreneurs NYC, Boston, Atlanta, DC, etc.) through competitive grants or RFPs.

#### Regional Challenges Facing Entrepreneurs

Professor, you have also had an opportunity to examine challenges facing different regions of the United States (i.e., the West Coast, Midwest, Great Lakes, Mid-Atlantic, New England, etc.).

#### **QUESTION 6:**

Can you elaborate on how these challenges differ by region?

In general, differences in regions can be attributed to the availability of venture capital funding and the number of start-ups. The West coast tends to dominate both in terms of deal size and number followed closely by the New England/Mid-Atlantic region. The concentration of venture capital money in three states, CA, NY and MA, means that many start-ups choose to locate their ventures in those states or end up moving from their founding-states to one of these locations. Consequently, competition for venture money is much more aggressive in these three states compared to other locations. At the same time, the Midwest, Great Lakes, and Southern regions of the U.S. still see relatively robust entrepreneurship activity although they do not see as much venture capital funding (with the exception of Chicago). Consequently, certain regions do not have fully-developed VC funding opportunities, resulting in opportunity gaps for funding scalable ventures. The dominance of the West coast and California in particular drives investments into certain sectors and technologies, skewing the direction of the entire VC industry. In the second quarter of 2019, the West coast accounted for around fifty-eight percent of deal value<sup>14</sup>. For women and minorities, the dearth of VC funding availability is compounded by the fact that the majority of VC money goes to three states—as a consequence, these states lead in the number of investments into women led ventures<sup>15</sup>.

#### **QUESTION 7:**

What kinds of differences are there between rural and urban areas?

In general, entrepreneurs can become the engine of economic re-development in rural areas particularly in contexts where a single industry or employer was dominant. Supporting rural entrepreneurship requires understanding the historic context of the city/region in question, the sets of skills that the existing workforce has and identifying market opportunities and gaps that can be addressed through entrepreneurship. Up-skilling or retraining efforts supported by public and private groups may be necessary in order to support the growth of rural economies through entrepreneurship. The availability of entrepreneur support organizations and programs in rural areas is an important consideration in addition to the availability of capital. Supporting a niche area for entrepreneurship, such as tourism, hospitality or agriculture, may also be a strategy that

<sup>14</sup> <https://pitchbook.com/news/articles/21-charts-showing-current-trends-in-us-venture-capital>

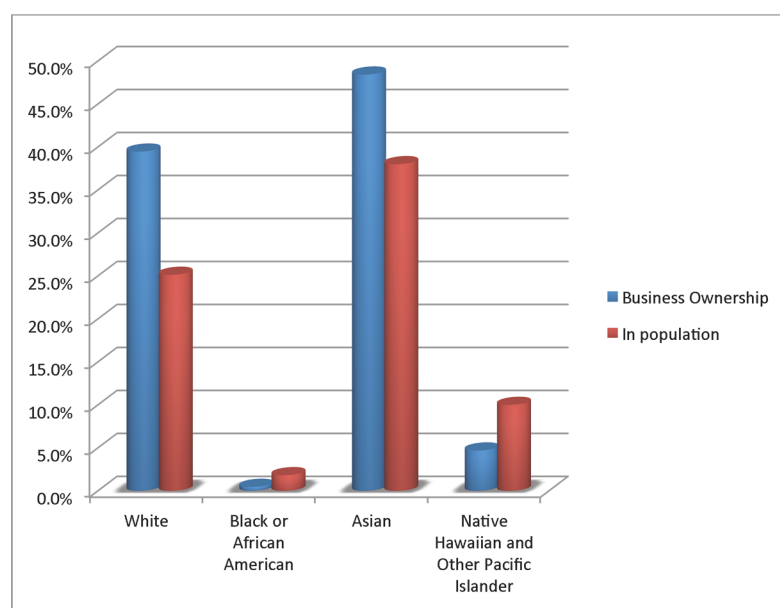
<sup>15</sup> *ibid.*

results in economic development. Transportation, communication and infrastructure concerns<sup>16</sup> may also be a consideration when supporting rural entrepreneurship. In contrast, urban areas tend to suffer from congestion but generally have more opportunities for entrepreneurial education, access to resources, entrepreneur support programs, and interactions with other entrepreneurs. Urban areas generally also have well-developed sectors and specialized training programs (i.e., educational institutions, internships, fellowships, paid programs, etc.) that allow individuals to enter these sectors either as employees or as entrepreneurs.

#### QUESTION 8:

What kinds of differences are there for a state like Hawaii, which you have identified as a “West Coast” state in your research, given its geographic isolation from venture capital hubs like Silicon Valley?

Hawaii has a unique history and location in the U.S. and these considerations figure prominently in its relationship to the VC industry. Looking at business ownership versus population, we see the following relationships<sup>17</sup>—Whites and Asians are overrepresented in business compared to their numbers in the general population while Native Hawaiian and Blacks are underrepresented:



<sup>16</sup> <https://costarters.co/wp-content/uploads/2018/07/RuralRISE-Insights-Report-2018.pdf>

<sup>17</sup> Calculated from 2016 Survey of Entrepreneurs and 2018 American Community Survey, available at census.gov

In Hawaii, women-owned businesses account for twenty-two percent of all firms while male-owned firms account for fifty-four percent of all firms. Minority women-owned firms account for sixty-three percent of all women-owned firms while minority male-owned firms account for sixty-two percent of all male-owned firms. In terms of the VC industry, Hawaii has an active venture capital group including the HVCA (Hawaii Venture Capital Association), which is led by a Meli James, a native of Honolulu. A report detailing the state of VC in Hawaii focuses on the economic strengths using the 2017 Kauffman Annual Index. In this report, Hawaii ranked 2<sup>nd</sup> overall out of the twenty-five small states in terms of rate of start-up growth, share of scale-ups and high-growth company density<sup>18</sup>. There are four trends which make Hawaii attractive for VC funding and investment firms: Growth in deal flow; HI Growth Initiative; Investment stability; Healthy early-state innovation ecosystem<sup>19</sup>

#### **QUESTION 9:**

What can we do to address these challenges?

To continue growing the importance of Hawaii in the context of the VC industry, initiatives like HI Growth Initiative coupled with incentives for firms to stay in Hawaii are paramount. In addition, additional funding for innovation ecosystem actors, such as universities, accelerators, and other groups, can provide much needed boost to the growing technology sector, resulting in increased VC attention and potential funding. Attracting large and/or established firms that can continue investing into Hawaii's growing innovation ecosystem can provide a boost. Finally, investing in workforce development to ensure that talent is available to firms that want to stay in Hawaii is also an important consideration for growing the state's economy in an inclusive fashion<sup>20</sup>.

#### Promoting Women and Minorities as Entrepreneurs

Professor, in your testimony, you spoke to the importance of promoting diversity and inclusion for the broader economy, the benefits of which have been reinforced by emerging research. Specifically, you alluded to the potential for smaller women-owned businesses to spur economic growth and create jobs.

#### **QUESTION 10:**

Can you elaborate on this research? What are the trends we are seeing for women and minority investors and entrepreneurs?

While nascent, we are seeing the rise of small-sized women and minority-led investment firms who are intentionally funding women and minority entrepreneurs. These groups still represent a small fraction of the overall VC industry, but if these trends continue, it is likely that over time, we will see a change in the decision-making dynamic of the industry as well as a change in the

<sup>18</sup> <https://hsdc.hawaii.gov/wp-content/uploads/2018/10/Hawaii-Venture-Capital-Report.pdf>

<sup>19</sup> *ibid.*

<sup>20</sup> <https://cdn.www.nwbc.gov/wp-content/uploads/2012/01/11092342/fact-sheet-native-hawaiian-women-owned-businesses.pdf>

profile of VC-funded entrepreneurs. The VC industry is experiencing record-growth, in 2Q of 2019, there have been 4,868 deals worth around 66 billions dollars. Women-led firms, while reaching new records, have only received 1.9 billions dollars or 0.02% of this money or 0.06% of deals so far<sup>21</sup>. Thus, these small but high-profile investment firms are garnering increased attention both in terms of their intentional approach to investing but also in terms of their success.

#### QUESTION 11:

Can you elaborate on the potential for women-owned businesses to spur economic growth and create jobs?

Research from the World Bank indicates that economies that have an increased amount of women's entrepreneurial activity are more resilient to financial crises, have more sustainable businesses, see longer periods of peace, and experience economic downturns less frequently<sup>22</sup>. A McKinsey and Company report indicates that in a scenario where women participated in the global economy equal to men, global GDP would increase by twenty-six percent or \$28 trillion<sup>23</sup>. Globally, female entrepreneurs are outperforming male entrepreneurs in terms of hiring<sup>24</sup>. In the U.S., if revenues generated by minority-women owned businesses matched those generated by all women-owned businesses, then the economy would gain \$1.2 trillion in revenues<sup>25</sup>. Further, supporting female entrepreneurs particularly in U.S. rural environments can provide much needed jobs and economic development<sup>26</sup>. Currently, women-owned businesses with revenues less than \$100K represent the majority of all women-owned businesses at around eighty-eight percent<sup>27</sup>. Yet once these businesses crossover into the \$250K revenue range, they start to grow exponentially, increasing their hiring and revenues. Thus, investing in smaller women-owned businesses to get them over the \$250K revenue hurdle and towards the \$1 million range will result in increased employment and revenues—these \$1 million plus revenue women-owned businesses have forty-six percent over the past eleven years (2007-2018) compared to twelve percent for all businesses. These companies increased their employment by thirty-percent during this time compared to a decline in employment for all businesses of 0.8%. Finally, these businesses increased their revenues by forty-five percent compared to thirty-six percent for all businesses<sup>28</sup>.

#### QUESTION 12:

<sup>21</sup> <https://pitchbook.com/news/articles/21-charts-showing-current-trends-in-us-venture-capital>

<sup>22</sup> <https://www.doingbusiness.org/content/dam/doingBusiness/media/Special-Reports/Womens-Entrepreneurship.pdf>

<sup>23</sup> [https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Employment%20and%20Growth/How%20advancing%20womens%20equality%20can%20add%2012%20trillion%20to%20global%20growth/MGI%20Power%20of%20parity\\_Full%20report\\_September%202015.ashx](https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Employment%20and%20Growth/How%20advancing%20womens%20equality%20can%20add%2012%20trillion%20to%20global%20growth/MGI%20Power%20of%20parity_Full%20report_September%202015.ashx)

<sup>24</sup> <https://www.ey.com/gl/en/newsroom/news-releases/news-ey-female-entrepreneurs-outperform-male-peers-in-job-creation>

<sup>25</sup> [https://about.americanexpress.com/files/doc\\_library/file/2018-state-of-women-owned-businesses-report.pdf](https://about.americanexpress.com/files/doc_library/file/2018-state-of-women-owned-businesses-report.pdf), p.5

<sup>26</sup> <https://cdn.www.nwbc.gov/wp-content/uploads/2019/05/08180133/Rural-Women-Entrepreneurs-Report-508-Compliant-Final2.pdf>

<sup>27</sup> [https://about.americanexpress.com/files/doc\\_library/file/2018-state-of-women-owned-businesses-report.pdf](https://about.americanexpress.com/files/doc_library/file/2018-state-of-women-owned-businesses-report.pdf)

<sup>28</sup> *ibid.*

What other benefits does improving diversity and inclusion have for the economy?

When all of a society's members have equal opportunity and access towards economic prosperity, they create an economy that is inclusive, robust and resilient. Diversity in entrepreneurship creates new products and services, diversity in society creates new markets and new customers, and diversity in the investment community provides opportunities to invest in cutting-edge innovations and technologies. Workforce diversity brings creativity to organizations and fuels growth and productivity. For example, reducing educational gaps by race/ethnicity can contribute an additional \$278 billion to the U.S. economy<sup>29</sup>, thereby increasing opportunities for employment and entrepreneurship, which in turn increase productivity and narrow pay gaps. Additionally, while investing in technology is important, it does not provide large increases in wages in the non-tradable sectors (i.e., those sectors providing local services such as education, health, retail, construction, etc.). Specifically, a 10% increase in technology employments results in 0.1% increase in non-tradable real wages<sup>30</sup>. Consequently, investing in sectors that employ a diverse set of the population rather focusing only on technology firms will contribute to economic development for a larger number of groups.

#### Promoting Investment in Smaller Firms

Professor, in your testimony, you also spoke to the thriving venture capital industry, which last year invested record amounts of capital in new and emerging companies (\$130.9 billion)—largely to the benefit of larger, higher-value firms.

#### **QUESTION 13:**

To your knowledge, have these record investments benefited smaller firms—for example, those that would benefit from investments at or below the \$5 million threshold?

These investments have not necessarily benefitted smaller businesses and thus, there is a serious capital gap facing these smaller firms. Programs like the SBIC and other targeted funds could support the growth of these smaller firms and thereby contribute to economic development in communities. While angel investments and seed funding are available at these smaller amounts, there is not necessarily a dedicated fund or entity that regularly funds at these levels. Given the difficulty associated with bank or other traditional loans, the availability of loans at the \$5 million or below level would likely support the capital needs of women and minority-owned businesses in their growth stages.

#### **QUESTION 14:**

How can we continue to promote smaller firms?

<sup>29</sup> <https://mellon.org/initiatives/our-compelling-interests/excerpts/economic-value-diversity/>

<sup>30</sup> Kemeny, T., & Osman, T. (2018). The wider impacts of high-technology employment: Evidence from US cities. *Research Policy*, 47(9): 1729-1740.

Small firms are the engine of economic prosperity and growth across the U.S. as they create jobs locally and sustain communities. Supporting their capital, market and talent needs to be a priority for all levels of the government. Dedicated funds that provide low or no-cost loans, grants or other funding opportunity through public and private partnerships are essential. Educational and mentorship programs that provide market analysis, business plan assessment, and market-fit and other services are important elements to supporting small businesses. Ensuring small businesses can file taxes and fulfill other necessary business obligations with ease is essential (i.e., dedicated information hotline, availability of online forms and information, etc.). Finally, dedicated opportunities for small business to participate in government contracts will provide much needed support to such businesses.