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Issue Brief

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Exploring the Policy Relevance of Startup Accelerators

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Overview

Startup accelerator programs are innovative funding mechanisms that have the potential to identify high-value startups and help them advance to the next stage of growth. Given the possibilities of creating multi-million and sometimes multi-billion-dollar companies quickly, policymakers have been considering whether accelerators could be used to meet public policy goals. While the accelerator model has had some notable successes in the technology sector, whether it can be as effective in other arenas is not as clear. This issue brief discusses some basic illustrative quantitative analyses to explore the relevance of accelerators as a policy tool. It finds that the sizeable variance of offerings in the accelerator market and geographical regions can limit accelerators' usefulness in increasing regional investment in startups and decentralizing the distribution of startup funding.

The Appeal of the Accelerator Model to Investors and Policymakers

Accelerators are an innovative funding mechanism utilized largely in the tech sector. They aim to reduce the time it takes to commercialize sometimes underdeveloped business ideas. A recent Office of Advocacy–contracted research report by Dempwolf, Auer, and D'Ippolito,[1] defines them as:

> Business entities that make seed-stage investments in promising companies in exchange for equity as part of a fixed-term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event, or demo day.

These authors find that the accelerator business model is heavily influenced by the areas of expertise of the individuals running the program. Accelerators utilize a competitive application process to select startups that the program's directors believe have the greatest capacity for growth and can best benefit from any program-inherent expertise. Then, accelerators provide mentorship, seed funding, and technical assistance to help speed up the time it takes for a startup to grow their business to become viable companies. If successful, their companies may go on to either go public, get acquired, or receive funding from an additional source. Some general evidence suggests that startups that go through accelerator programs receive funding faster than startups that utilize other alternative financing mechanisms.[2]

1. "Innovation Accelerators: Defining Characteristics Among Startup Assistance Organizations" C. Scott Dempwolf, Jennifer Auer, and Michelle D'Ippolito (2014). U.S. Small Business Administration, Office of Advocacy. Available at http://www.sba.gov/advocacy/innovation-accelerators-defining-characteristics-among-startup-assistance-organizations.
2. "Accelerators and Crowd-Funding: Complementarity, Competition, or Convergence in the Earliest Stages of Financing New Ventures?" Sheryl Winston Smith, T.J. Hannigan, and Laura Gasiorowski (paper presented July 12-13, 2013). Available at http://ssrn.com/abstract=2298875.

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Even though accelerator programs are primarily a funding mechanism, two critical factors differentiate them from other business development programs: (1) their focus on scalable high-growth, high-value companies and (2) the ability of graduates to access program directors' vast social networks.[3] These key points of emphasis have piqued investors' interest as a way to potentially reduce some of the risk from investing in new tech startups.[4] With increased investor demand and high-visibility accelerator program graduates[5] such as Reddit, Airbnb, and Dropbox, the accelerator has grown into a global phenomenon.[6] Policymakers have also taken notice of this trend and are drawn to its potential in contributing toward two important policy goals:

- Increasing regional investment in startups;
- Decentralizing the distribution of startup funding.

This issue brief provides some basic illustrative quantitative analyses to explore the ability of accelerator programs to meet these goals.

Benefits of increasing regional investment in startups. One major appeal of the accelerator model is its ability to invest in many startups within a short period of time. Since accelerator programs tend to be only a couple months long, they have a particularly strong incentive to select scalable, potentially high-value companies for entry into their program because they want to get a return on their investment. Just as accelerators are hoping to own a stake in a future billion-dollar company, regions are hoping to realize the substantial tax revenues and broader economic benefits that come with successful entrepreneurs.

Given the large number of startups that an accelerator could support over a given year, accelerators are being considered as policy tools to spur regional entrepreneurship. There is evidence in the economic literature that regions with more entrepreneurial activity tend to experience better economic outcomes. For example, recent research found that regions with a mixture of active small and large businesses tend to be more innovative than regions whose economies are dominated by large firms. Regions with a diversity of firm sizes also tend to have more meaningful patenting activity; they create proportionally more patents as well as more useful ones.[7] This finding may be significant as there is evidence that patenting can be a strong predictor of state-level economic growth.[8] Similarly, Glaeser, Kerr, and Kerr found that increasing the proportion of startup employment within a region increases the growth rate of overall employment and wages.[9]

Importance of decentralizing the distribution of startup funding. Access to capital is a critical part of a startup's development. However, funding for startups and small businesses can be unevenly distributed. As a result, conventional funding sources may concentrate funding to specific groups of people, specific geographic areas and specific industries.[10] Even outside of the traditional lending arena, sources such as venture capital can also be centralized. In the second quarter of 2014, more than half of all venture capital dollars were invested in the Silicon Valley region, and the region's total venture capital was more than every other region combined. Likewise, software companies commanded almost half of all venture capital dollars and have almost $3 million more in venture capital funding than the next largest industry, biotechnology.[11]

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3. For a more robust discussion of the reasoning behind the concept and its implications for business development, see "Accelerating Startups: The Seed Accelerator Phenomenon," Susan Cohen and Yael Hochberg (2014). Available at: http://ssrn.com/abstract=2418000.
4. "How Famous Accelerators Y Combinator and Techstars Usher in a New Paradigm for VCs," Jeremy Quittner, *Inc.* magazine. Available at www.inc.com/jeremy-quittner/accelerator-change-venture-capital-dynamics.html?cid=sy01304.
5. "These Are The 15 Best Accelerators In The U.S." Jonathan Shieber, TechCrunch. Available at http://techcrunch.com/2014/03/10/these-are-the-15-best-accelerators-in-the-u-s.
6. "What's Fueling the Explosion in Start-Up Accelerators?" Chris Morris, CNBC. Available at http://www.cnbc.com/id/101167626.
7. "Why are some regions more innovative than others? The role of firm size diversity" Ajay K. Agrawal, Iain M. Cockburn, Alberto Galasso, and Alexander Oettl (2012). NBER Working Paper No. 17793.
8. "State growth empirics: Long run determinants of state growth" Paul W. Bauer, Mark E. Schweitzer, and Scott Shane (2006). Working Paper 06-06, Federal Reserve Bank of Cleveland.
9. "Entrepreneurship And Urban Growth: An Empirical Assessment With Historical Mines" Edward L. Glaeser, Sari Pekkala Kerr, and William R. Kerr (2013). Working Papers 13-15, Center for Economic Studies, U.S. Census Bureau.
10. "Access to Capital for Women- and Minority-owned Businesses: Revisiting Key Variables" Christine Kymn. U.S. Small Business Adminstration, Office of Advocacy. Available at http://www.sba.gov/advocacy/issue-briefs.
11. Data are available from the PwC/NVCA MoneyTree report at http://pwcmoneytree.com/.

This centralization of funding puts startups from overlooked geographic areas or industries at a disadvantage. Since accelerators are independent of some conventional funding mechanisms, some entrepreneurs see them as an alternative to the current distribution of startup funding.[12] Similarly, some policymakers have experimented with using the accelerator model as a way to support non-profit and socially-responsible startups, two groups of entrepreneurs who may have difficulty finding venture capital funding.[13]

Data To Explore the Ability of Accelerators To Meet Policy Goals

The publicly available data sources on accelerators are based on voluntary reporting by startups and accelerators themselves. These sources are neither comprehensive nor complete, which limits the applicability of generalizations based on them.

Accelerator and Startup Data

Startup data from Seed-DB. Seed-DB is the most widely used source of accelerator information. It provides recent data on accelerator programs' demographic and portfolio information. Seed-DB is used here for all accelerator-specific information: a concrete list of what accelerators are out there, where they are located, how many companies are in their portfolios, and the financial value of investments in participating startups.[14] .

Startup data and accelerator investment data from CrunchBase. Seed-DB is based on monthly data from CrunchBase, a crowdsourced database of startup and startup investment information.[15] CrunchBase is used here for all startup- and investor-specific information, including the location of startups that a Seed-DB accelerator invested in, as well as the value of the individual investments.[16]

Concerns with using crowdsourced data. CrunchBase and Seed-DB depend on crowdsourced, or user-submitted, data on startups. While these sources are transparent about how they collect data for their databases,[17] it does not diminish the potential for this collection mechanism to threaten the validity of analyses that use these data sets. The biggest concern for this analysis is that some key data fields may be missing. For example, almost 40 percent of accelerator entries in Seed-DB are missing startup funding amounts and many CrunchBase investment entries are missing location data. Therefore, it is possible that this analysis has overlooked relevant startups and investments because of missing data. Given the substantial variance within the number of startups in an accelerator portfolio as well as their collective financial value, some of these missing data points may exacerbate statistical biases within these sources.[18] In the absence of more specific, authoritative data, this analysis relies solely on descriptive statistics and avoids any inferential statistical methods. Consequently, all statistics should be viewed as illustrative.

Venture Capital Data

PwC/NVCA MoneyTree Report based on data from Thompson Reuters. Venture capital can be a significant part of successful startup financing. In order to explore the implications of accelerators on capital distribution,

12. "Why Venture Capital Wasn't Right for Me and 15 Alternative Funding Sources," Laurie Peterson, Fast Company. Available at www.fastcompany.com/3036130/hit-the-ground-running/why-venture-capital-wasnt-right-for-me-and-15-alternative-funding-sou.
13. "Innovative Funding Model from Silicon Valley Could Change How Non-Profits and Socially Responsible Firms Do Business." Jonathan Porat. U.S. Small Business Administration, Office of Advocacy. Available at http://weblog.sba.gov/blog-advo/?p=2811.
14. Data are available at http://www.seed-db.com.
15. Data are available at http://www.crunchbase.com
16. This issue brief relies on CrunchBase for all startup- and investor-specific information. While CrunchBase has data on startups and investors located all over the world, this issue brief only considered CrunchBase entries with a named investor and startup location in the United States for any geographic analyses. As a result, some areas of the country such as the Boston-Cambridge Massachusetts region may be underrepresented in the dataset used for this study as they may be missing listed information necessary for this issue brief's analyses.
17. See http://info.crunchbase.com/about/faqs/
18. See www.forbes.com/sites/kauffman/2012/08/08/evaluating-the-effects-of-accelerators-not-so-fast for a further discussion of these biases and further threats to validity.

this analysis augmented accelerator and startup data with data on regional venture capital financing from the PwC/NVCA[19] MoneyTree report. This source provides venture capital deals and funding amounts for each quarter of the fiscal year starting in 1995 by region. To ensure consistency, this analysis uses the regional definitions provided by PwC/NVCA for any geographic analyses. These regional definitions are more inclusive than those used in CrunchBase and they balance out some of the large regional variances in accelerator data .

Evaluating Accelerators' Ability To Meet Policy Goals: Basic Illustrative Analyses

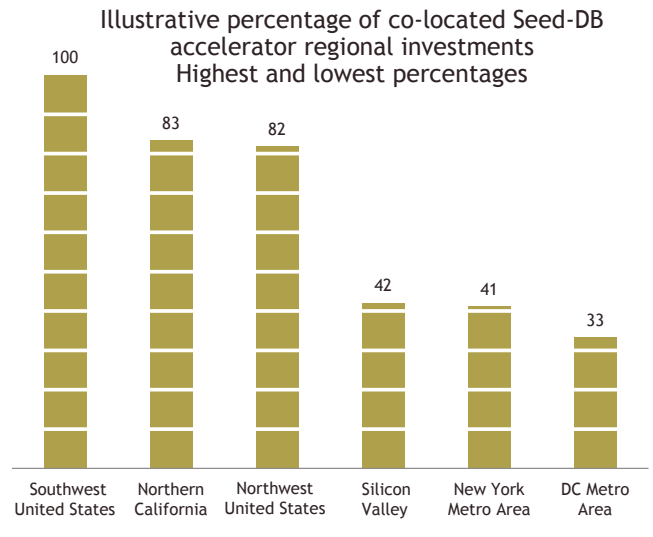
Increasing regional investment in startups. For accelerators to be an effective tool in promoting entrepreneurship locally, they must invest within their own regions.To explore whether accelerators increase regional investment in startups, this analysis examined the extent to which accelerators invest within their own geographical regions.

Data, methods, and results. The analysis identified all investments on CrunchBase that were associated with an accelerator listed on Seed-DB. Then, all of the relevant investments were grouped by region. The investing accelerators' regions were compared to each startups' region. Then, the percentage of investments an accelerator made in its own region was determined.

Given the slight differences in the regional definitions used in the PwC/NVCA reports and CrunchBase, some regional estimates, especially those covering California, are inexact. In particular, it was often difficult to distinguish investments in the "Northern California" region and the "Silicon Valley" region. Many "Northern California" investments were considered to be co-located (i.e., internal to the region) if they were generally near that part of California.

The analysis showed considerable variation in accelerators' investments in startups within their regions. Accelerator regional investment percentages ranged from a high of almost 100 percent of investments co-located from Southwest U.S. accelerators to a low of almost one-third of investments being co-located in the Washington, D.C., Metro area (Figure 1). In general around 60 percent of a region's accelerator's investments were co-located. These results indicate that policies that use accelerators to increase regional startup investment may have unintended consequences, namely, that investments made by a region's accelerators may go to startups outside the region—on average over one-third and possibly up to two-thirds.

Figure 1. These are the people in your neighborhood: Accelerators investing in their own backyard



Data source: Seed-DB, CrunchBase.

The relationship between venture capital and regional accelerator investment. Accelerators invest differently depending on the region in which they are located. One factor that may explain some of this variation is the presence of venture capital. If a region has less venture capital, accelerator funding becomes relatively more important as an alternative funding source. Conversely, if there is more venture capital in a region, then an accelerator's access to that region from the outside becomes relatively more important. In

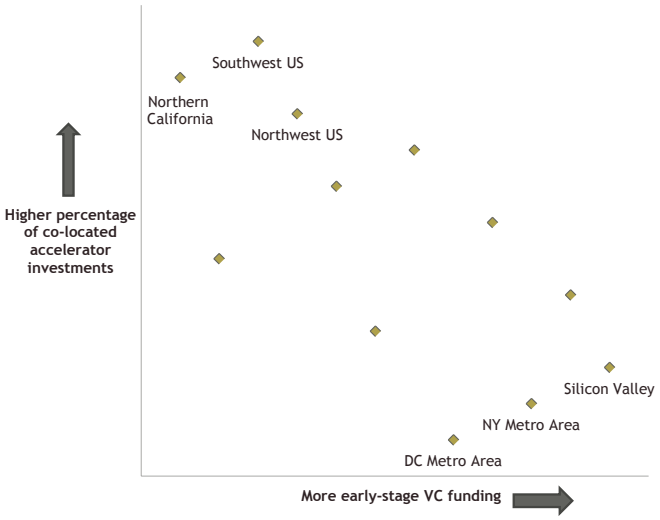
19. NVCA = the National Venture Capital Association; this source is based on data collected by Thompson Reuters.

both of these cases, it is reasonable to expect that as venture capital increases in a region, regional investment from accelerators decreases. Policymakers may be interested in whether this relationship comes through in the data because it will mediate the effectiveness of accelerators as a regional investment policy tool.

Data, methods, and results. To to see which region had the most regional investment and venture capital dollars, the list of CrunchBase startup investments from Seed-DB accelerators in Figure 1 was matched with regional early-stage venture capital funding amounts from PwC/NVCA. Then, each region was ranked to see which had the most regional investment and venture capital dollars respectively. An illustrative scatter plot (Figure 2) was created to see if there is any relationship between accelerator regional investment and early-stage venture capital rankings. It is clear from Figure 2 that there is an inverse relationship. As expected, regions with more venture capital tend to have less regional investment from accelerators. Interestingly, the three regions with the most venture capital funding are the regions with the least regional investment. As a result, policymakers may want to be aware of the availability of other financing before using accelerators to increase regional investment in startups.

Figure 2. Regions with more VC funding have less regional investment from accelerators

Regions' rank of co-located accelerator investments by rank of early-state VC funding
(Top 3 regions for each category are labeled)



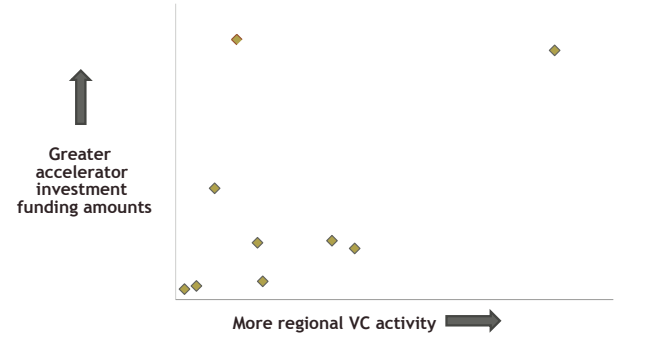
Data source: Seed-DB, CrunchBase, PwC/NVCA.

Decentralizing the distribution of startup funding. As a nontraditional funding mechanism, accelerators are seen as a potential solution to the concentration of startup capital in a handful of regions and industries. In order to explore whether they help achieve this goal, this analysis examines the geographic distribution of accelerator investment dollars and early-stage venture capital to see if they follow a similar pattern or complement each other; or to put it another way, whether accelerators reinforce or disrupt centralized startup funding networks.

Data, methods, and results. This analysis used a method similar to Agrawal, Catalini, and Goldfarb's[20] basic analysis of the geographical distribution of crowdfunding dollars. This approach is used here to examine how the distribution of accelerator investment dollars compares to the distribution of early-stage venture capital activity or deals. Using data from Crunchbase and PwC/NVCA, the total number of venture capital deals were tied to the total value of individual accelerator investments for a region. An illustrative scatter plot (Figure 3) was then created comparing accelerator investments to early-stage venture

Figure 3. Regional distribution of accelerator investment does not necessarily complement venture capital activity

Value of regional accelerator investments by regional venture capital activity (Silicon Valley is omitted for clarity)



Data source: Seed-DB, CrunchBase, PwC/NVCA.

20. "Some Simple Economics of Crowdfunding" Ajay K. Agrawal, Christian Catalini, and Avi Goldfarb (2013). NBER Working Paper No. 19133.

capital deals.[21] The scatter plot shows that the geographic distribution of accelerator investments does not necessarily complement or disrupt the distribution of venture capital activity.

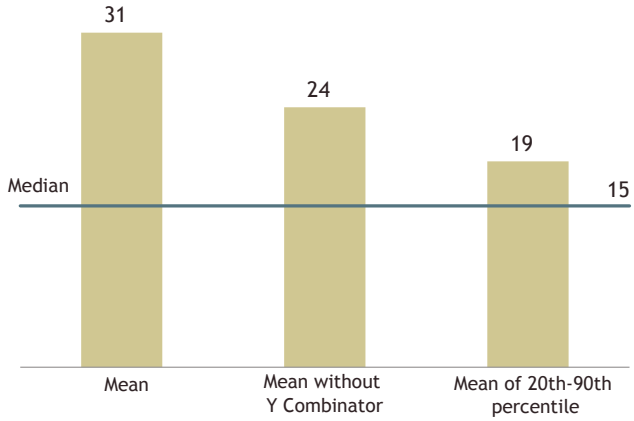
If policymakers are intending to utilize accelerators as a way to decentralize startup funding, then they would expect that accelerators could complement the geographic distribution of venture capital. That is, if venture capital is localized, then policymakers would probably like to see accelerator investments in places where there is not a lot of venture capital activity. Moreover, policymakers in this case may not want accelerator investments to be heavily located in places with a lot of venture capital as this reinforces centralization. While this illustrative scatterplot is insufficient to make a clear determination, it does indicate that accelerator funding could be going largely to places with more venture capital activity. More specific data will be needed to determine the validity and magnitude of any potential relationship. However, policymakers should consider that solely subsidizing accelerators may be insufficient to decentralize startup funding.

Policy Implications

Variance in the accelerator marketplace should temper expectations of accelerator-based economic policies

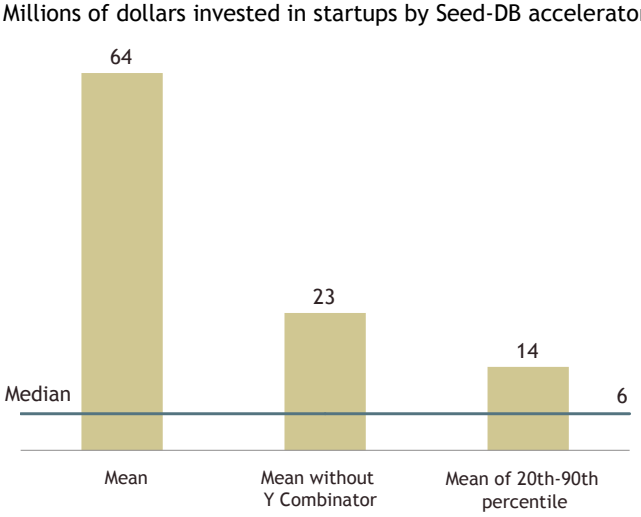
Accelerator programs located in different regions invest differently. The Seed-DB data show that accelerator portfolios vary widely, both in terms of the number of startups supported and funding amounts.[22] As figures 4 and 5 show, the average funding and number of companies differs depending on how you are measuring accelerators. In short, it is difficult to define a "typical" accelerator from these data. Some accelerators have massive portfolios of investments in tech startups trying to get a billion-dollar valuation, while others are intentionally small and may be looking for companies that will help improve the well-being of the community rather than the "next Facebook." For example, Y Combinator is so gigantic that simply omitting it from analyses reduces the average value of investments by Seed-DB accelerators almost threefold. In most cases, the average value for these companies is substantively different from the median or 50th percentile value.

Figure 4. The mean number of companies in a Seed-DB accelerator is more than double the median value



Data source: Seed-DB.

Figure 5. The mean amount invested in startups by a Seed-DB accelerator is 10 times the median value



Data source: Seed-DB.

21. Since it has so many more venture capital deals and accelerator investment dollars, Silicon Valley was omitted from the scatterplot for clarity.

22. Throughout this issue brief, data needed to be trimmed and cleaned to take regional outliers into account. In some cases, accelerators and specific regions were so massive as to heavily bias and skew any reliable statistical estimates of the current state of the accelerator marketplace. In other cases, accelerators and regions were so small as to be unrepresentative of the average accelerator.

Therefore, policymakers should appreciate that individual accelerators will vary greatly and that a one-size-fits-all accelerator-related policy may not encourage the intended policy outcomes. Moreover, this analysis found that in some regions it is possible that less than half of all investments from accelerators actually go to startups in that region. Across the board, it is unreasonable to assume that leveraging an accelerator to grow startups and entrepreneurship in a region will always yield a meaningful increase in regional investment. However, on a region-by-region basis it does appear that accelerators could be particularly useful in terms of either providing resources to hungry startups or access to vital social networks of investors and entrepreneurs. Without more authoritative and reliable data though it is difficult to directly determine where the accelerator model would be most relevant for policymakers.

Accelerators' impact on decentralizing startup funding may be affected by their environment. This analysis found that the geographic distribution of accelerator funding does not necessarily complement the distribution of venture capital activity in the way that some policymakers desire. Agrawal, Catalini, and Goldfarb came to a similar conclusion regarding crowdfunding, showing that it is distributed like venture capital.[23] Similar to accelerators, some policymakers see crowdfunding as an alternative financing mechanism that has the potential to decentralize startup funding, but so far the distribution has tended to mirror established patterns. The researchers interestingly note that one of the reasons behind this distribution could be the allocation of human capital.

Broadly speaking, certain regions may be better suited for certain industries. This may be because there are a large number of similar entrepreneurs, there is a high concentration of specialized labor, capital, and finance, and there are discerning consumers.[24] The tech industry in particular depends on specialized regions as startups look for coders and programmers, guidance, financing, and a discerning market of early adopters. Hence, simply supporting accelerators and other alternative funding mechanisms may by itself be insufficient to decentralize the distribution of startup funding.

In order to sustain some of the entrepreneurial development, it is possible that regions may have to establish a more robust infrastructure for growing businesses as they progress out of the seed and early stages. More generally, other regions may have public policy more conducive to startups, and when coupled with this industry specialization, this gives them an advantage in funding startups.[25] It seems at this point that accelerators are not disrupting centralized funding patterns. However, since this kind of seed- and early-stage investment can be a signal for venture capitalists to invest later on,[26] accelerators may decentralize access to technology centers valuable for growing startups. For example, while Silicon Valley dominates funding through venture capital and accelerator investments, only 42 percent of its accelerator investments are co-located within the region. This finding means that more entrepreneurs outside the region are now able to take advantage of valuable resources from Silicon Valley. Without accelerators it is likely that some promising entrepreneurs would have been shut out of these opportunities.

Conclusion

Accelerators represent one way that policymakers can apply innovative new ideas to solve longstanding policy problems. However, the economy is complex. While the accelerator model has some evidenced success and the potential to be extremely relevant to policymakers, it is important to keep those successes in perspective. When setting policy, policymakers should appreciate that the accelerator marketplace is dynamic and that differences in business environments may influence economic policies in ways that they may not expect.

23. "The Geography of Crowdfunding" Ajay K. Agrawal, Christian Catalini, and Avi Goldfarb (2011). NBER Working Paper 16820.
24. "Clusters of Entrepreneurship and Innovation" Aaron Chatterji, Edward L. Glaeser, and William R. Kerr (2013). NBER Working Paper No. 19103.
25. "Why Tech Won't Liberate D.C.'s Economy From the Feds" Aaron Wiener (2014), *Washington City Paper*. Available at http://www.washingtoncitypaper.com/blogs/housingcomplex/2014/01/22/why-tech-wont-liberate-d-c-s-economy-from-the-feds/.
26. "Show Me the Right Stuff: Signals for High Tech Startups" Annamaria Conti, Marie C. Thursby, and Frank T. Rothaermel (2011), NBER Working Paper No. 17050.

Examining the Startup Accelerator Phenomenon: Other Recent Work from the Office of Advocacy

Two additional Advocacy publications examine the current status of startup accelerators:

"Innovation Accelerators: Defining Characteristics Among Startup Assistance Organizations," a research report by C. Scott Dempwolf, Jennifer Auer, and Michelle D'Ippolito published in October 2014. Available at http://www.sba.gov/advocacy/innovation-accelerators-defining-characteristics-among-startup-assistance-organizations.

"Innovative Funding Model from Silicon Valley Could Change How Non-Profits and Socially Responsible Firms Do Business," a blogpost by Jonathan Porat published on October 8, 2014. Available at http://weblog.sba.gov/blog-advo/?p=2811.