TechGROWTH Ohio: Public Venture Capital and Rural Entrepreneurship

G. Jason Jolley
Ohio University

Ikenna Uzuegbunam
Ohio University

John Glazer
Ohio University

Received: 06/07/2017
Accepted: 07/28/2017
MCRSA Presidential Symposium
48th Annual Conference (2017)

Abstract

TechGROWTH Ohio (TGO) is a public, rural venture development organization serving the 20 counties of Southeast Ohio. From 2007 to 2016, TGO engaged with over 1300 entrepreneurs, assisted over 1100 startups, provided funding support to over 90 companies and invested in 14 portfolio companies. This sustained effort resulted in over $350M of non-State follow-on resources acquired in support of client companies and the creation of over 575 direct jobs in the region with an average salary of $53,750 in a region where median household income is $33,823. TGO has achieved a leverage ratio of $17.8 for every $1 of State spending. This paper places TGO in the context of best practices in public venture capital and entrepreneurship support in rural America. It also highlights both short-run and long-run impact at the company and regional ecosystem level.

1 Introduction and Motivation

Among many modern societies, entrepreneurship is often seen as the panacea for economic development challenges (Baumol, 1990; Bologna, 2014; Feldman, 2014; Goetz et al., 2010; Schumpeter, 1934). The widely held view that entrepreneurial activity is good for society–since it is associated with both job creation and wealth formation– has led to widespread efforts by governments to encourage and support different forms of entrepreneurial activity in a wide range of settings. In particular, formulating and implementing effective entrepreneurial development strategies, which can influence economic development in rural communities, is an area of critical concern because rural areas often need new ways to revitalize their declining economies and populations (Walzer and Athiyaman, 2007). Economic development through entrepreneurship also represents an alternative to business attraction strategies in regions with underdeveloped infrastructure. Thus, without entrepreneurial development to stimulate rural economies, these economies could lose their vitality via migration of young people to urban centers in search for better economic opportunities.

Rural settings hold particularly unique challenges for efforts aimed at encouraging entrepreneurial activity. In contrast to urban areas, rural areas tend to be primarily dependent on agriculture or on extractive or declining manufacturing industries (Goetz et al., 2010). Rural areas tend to lack dedicated centers of innovation, spinout opportunities from established businesses, knowledgeable service providers supporting new company development, and role models of successful, high-growth startups. Thus, rural areas yield

limited entrepreneurial opportunities that can attract and retain human capital and venture capital required for high growth entrepreneurship. Put differently, rural areas often lack the sophisticated demand conditions, factor conditions, supporting industries, and competitive forces that aid the creation of a strong and thriving entrepreneurial ecosystem (Porter, 1998). Importantly, because entrepreneurs are often spatially dependent on other entrepreneurs (i.e. agglomeration economies; Bologna (2014); Delgado et al. (2010); Goetz et al. (2010)), the challenges of creating and sustaining the requisite critical mass of entrepreneurs (i.e. the entrepreneurial ecosystem) is more challenging in the rural areas due to declining and geographically dispersed populations lacking central gathering places.[1]

This paper examines best practices in public venture capital and entrepreneurship support in rural America, through the lens of TechGROWTH Ohio (TGO), a public rural development organization focused on stimulating and nurturing technology entrepreneurship in the Southeast Ohio region. Findings from this case analysis contribute to the literature in two ways. First, it reveals how public venture capital (VC) can be structured to nurture entrepreneurial talent in the rural context. Second, it documents how public VC can catalyze the development of the entrepreneurial ecosystem that provides follow-on resources to rural entrepreneurs. The quantitative evidence from this case analysis demonstrate that TGO's service approach to venture development and its investment strategy in the Southeast Ohio region is economically impactful.

Furthermore, in an effort to highlight these findings, we engage public policy debates regarding whether governments should be in the business of "picking winners and losers" as well as related theoretical discussions regarding whether public venture capital encourages moral hazards of "free money" or crowding out of private equity (Cumming and MacIntosh, 2006; Grilli and Murtinu, 2014; Lerner, 2009). Finally, this paper considers potential implications of the TGO findings for distressed cities (e.g. Detroit, Michigan), or developing countries, while noting important differences across regions and countries.

The remainder of the paper proceeds as follows. Section 2 provides a review of the related literature on public venture capital and rural entrepreneurship. Section 3 describes the case analysis of TGO and draws out the key findings from this case analysis. The implications of these findings for theory and practice are considered in Section 4. Section 5 concludes by highlighting limitations, as well as opportunities for future research.

2 Related Literature: Public Venture Capital

Along with the burgeoning interest in entrepreneurial development there is growing interest from many governments around the world in facilitating and supporting venture capital. Recent estimates suggest that venture capital (VC) firms owned or supported by governments participated in over $4 billion per year investments in privately held firms, globally (Brander et al., 2015). The main motivation for governments to intervene in venture capital is because of market failure problems associated with information asymmetries and imperfections in the markets for innovation. Governments often identify gaps in the private investment community's willingness to invest in early-stage, high-risk innovations despite a high-return potential and tend to intervene early in the technology commercialization continuum. In the United States, globalization and economic restructuring have been drivers for state level public VC programs (Leicht and Jenkins, 1998).

According to one stream of the literature, public VCs can play a role in supporting entrepreneurs in markets with high degrees of information asymmetries between entrepreneurs and private VCs (Uzuegbunam et al., 2017). That is, public VCs can fill the void in resource markets for entrepreneurship through seed investments, and in the process, may help certify ventures for other audiences in venture capital markets (i.e. the seeding or certification hypothesis). For example, public VC can be beneficial in the early stages of technology-intensive industries where traditional financial measures are of limited value (Lerner, 1999, 2002).

A related argument for public VC, which is supported by European evidence, is that they energize the private equity market overall by signaling governmental support for entrepreneurial finance activities and the "public value" thereof (Leleux and Surlemont, 2003). In this vein, Brander et al. (2015) cross-country

[1] An example of an entrepreneurial ecosystem is the Massachusetts medical device cluster. In this instance, the ecosystem is centered on one industry. Porter (1998) argues that though initially unrecognized, this cluster is responsible for 400 companies that have produced at least 39,000 high paying jobs within that region.

study demonstrated that new ventures that receive both public and private VC had better performance than their peers that received only public or private VC. Put together, the proponents of government intervention in venture capital contend that public VCs are a complementary vehicle for private VCs in markets for innovation which contribute to both new venture and "public value". This is accomplished by early public VC enabling validations and risk reductions that make later private VC investments more attractive.

However, an opposing stream of the literature has been critical of public sector intervention in venture capital markets. The arguments and evidence in this stream of literature suggest that government intervention in venture capital can crowd out other forms of private equity. For example, Cumming and MacIntosh (2006) showed that Canadian tax-driven public VC (i.e. Labour–sponsored venture capital corporation) have comparatively higher levels of inefficiency than private VC. The evidence in this study of Canadian public VC is also consistent with the hypothesis that public VC crowds out private VC from the marketplace. These findings related to the inefficiency of public VC are corroborated in a recent European Union study (Grilli and Murtinu, 2014)[2]. These latter studies support the view that under certain conditions, public VC is an inefficient substitute for private VC due to underperformance but also because they tend to reduce overall level of entrepreneurial support to entrepreneurs.

The effect of public VC is context-dependent with effectiveness varying based on rurality, company type, competing VC funding, and other factors. In a study of small technology companies in Spain, del Palacio et al. (2012) found public interventions, including public VC, coupled with investor experience explained investments in technology companies. Munari and Toschi (2015) studied VC-backed firms in the United Kingdom on a regional level. They found evidence that public VC offset the reduction in private VC, but public VC in a regional context was less effective, especially in regions with less technology development. In sum, the preceding review suggests that the degree to which public VC is a beneficial to society is dependent on the context.

3 Case Study of TechGROWTH Ohio (TGO)

In 2002, Ohio voters approved a $1.6 billion state investment to create the Ohio Third Frontier Commission. The goal of the Ohio Third Frontier Commission was to create an "innovation ecosystem" by funding technology based economic development in the form of applied research and commercialization, entrepreneurial assistance, and early-stage capital formation (Beagle, 2016). In 2007, an additional $700 million was reauthorized for the program (Beagle, 2016). TechGROWTH Ohio is one of six Entrepreneurial Services Providers (ESP) (formerly known as Entrepreneurial Signature Programs) in the state. "Each ESP provides an approach that tightly integrates sources of deal flow, entrepreneurial support, and capital to effectively grow the technology-based entrepreneurial commercialization outcomes" (Ohio Third Frontier, 2017).

TechGROWTH Ohio serves a 20-county region in Southeast Ohio. Southeast Ohio is comprised of rural, economically–challenged counties in the Appalachian Regional Commission's designated ARC region. From 2007 to 2016, TGO engaged with over 1300 entrepreneurs, assisted over 1100 startups, provided funding support to over 90 companies and invested in 14 portfolio companies. This sustained effort resulted in over $350M of non-State follow-on resources acquired in support of client companies. Such follow-on resources include financial capital (equity investment, debt financing, grants, and customer capital from sales and contracts) as well as social capital (collaborators and mentors, in-kind services, supply chain connections, initial customer acquisition, and strategic partnerships). Here, it is important to note the causal connection between the services rendered and the resource acquired. The relationship is captured in the "but for" connection, as in "but for" TGO's assistance, the company would not have acquired the follow-on capital that accelerated its commercialization process.

TGO's efforts led to the creation of over 575 direct jobs in the region with an average salary of $53,750 in a region where median household income is $33,823. TGO has achieved a leverage ratio of $17.8 for every $1 of State spending. In the early years of the program, there was a 2:1 state match in the funding, which

[2]Similar to Cumming and MacIntosh (2006), these authors also attribute the inefficiency of public VCs to the design and structure taken in different countries. For example, the Australian Innovation Investment Fund (IIF) government program have been shown to have an efficient structure, which has positively contributed to the development of the Australian venture capital industry (Cumming, 2007).

was reduced to 1:1. This points to an early state incentive to engage private funding and also express the success of the program in the shift to 1:1 match, indicating that the extra incentive was no longer needed, in light of demonstrated value and success.

TGO is housed and supported by Ohio University, the region's major higher education and research institution. TGO's strong and growing partner network employs a shared services model of intensive, customized assistance for early-stage technology companies designed to help them qualify for and acquire resources necessary for accelerated commercialization. Over time, TGO adapted its network and its approach to engage regional assets, develop deal flow, create a culture of entrepreneurial support and increase its effectiveness in growing strong companies capable of bringing new technologies to market. To increase availability of local capital, TGO has helped to organize three successful angel funds in the region and serves them by sourcing and vetting investment opportunities.

- TGO brought a professional, equity-based entrepreneurial support system to the Southeast Ohio region.
- TGO uses and applies venture capital practices and Lean Startup principles to establish early validations, engage customer discovery, test business models, guide pivots and establish capital efficient trajectories.
- TGO has progressively assessed and optimized policies and procedures for data-driven, metrics-producing resource deployment into prospective high-growth clients.
- TGO has built a highly qualified and experienced Entrepreneur-in-Residence (EIR) team, talent development, and recruitment capacity, and
- TGO has helped to organized private investment funds and built credibility with investor networks to open doors of opportunity for startups to acquire growth resources.

There are some unique aspects of the TGO entrepreneurial development model. Below, the analysis focuses on two critical roles that TGO plays in the Southeast Ohio entrepreneurial ecosystem.

3.1 TGO as Entrepreneurial Talent Nurturer

The current state of the technology-based economic development ecosystem in Southeast Ohio is vibrant and strong. It is also still evolving, as deal flow generation activities engage local communities and penetrate deeper into regional sources of innovation, as success stories strengthen the TGO brand, as new sources of capital are organized, as gaps in the service continuum are progressively addressed, and as lessons learned are incorporated into the TGO service delivery model.

In more urban environments where there is often an excess of qualified deal flow supported by an infrastructure of service providers, VC firms often operate to screen and quickly disqualify companies seeking VC. In rural locations, such as Southeast Ohio, companies may not be prepared to qualify for VC and may lack the talent to execute on VC received. As such, TechGROWTH pursues a *slow yes* model of assisting prospective VC recipients in talent development to be better prepared to receive financial support, potentially including public and/or private VC funds. This talent development has taken place in four forms:

1. Technology Commercialization Talent
2. Entrepreneurial Talent Development
3. Talent Growth and Expansion
4. Shared Services Talent Development.

Technology commercialization talent focuses on filling talent gaps appropriate to a company's stage of venture development. Gaps are bridged through intensive, one-on-one consulting with TechGROWTH EIRs who draw on their own entrepreneurial experience, and through working group settings involving multiple EIRs, jointly focused on client-specific strategies for overcoming obstacles and achieving milestones. TechGROWTH also provides funding support to companies in the incubating and demonstrating phases to

outsource to third party providers for prototype development, intellectual property protection assistance, engineering and software services, and lead generation. EIRs working as a team in a shared services model ensure that the uses of this non-dilutive funding are laser-targeted to achieving the validations needed to enable the client to qualify for and acquire additional resources needed to accelerate commercialization. Sales and marketing assistance is available to companies once they have demonstrated the ability to create value with their product or service line. At the market entry phase, local company founders receive access to general and specific skills and training. This is important given the challenges of recruiting external talent to a rural region. TGO has been successful in recruiting C-suite talent for four portfolio companies and aided in two additional C-level recruitments for companies needing engineering and sales assistance.

Entrepreneurial talent development includes general and specialized training to support existing entrepreneurs and attract new entrepreneurs to the program. This includes courses on technology commercialization, Lean Startup practices, Business Model Canvas, and capital access planning, among others. At the university level, these include Bobcat Launchpad Course to target student entrepreneurs at Ohio University, and the Commercial Skills for Researchers Seminar Series for university researchers and graduate students. TechGROWTH also played a key role in forming I-Corps@Ohio, the first-in-the-nation statewide program out of the Ohio Department of Higher Education modeled on the National Science Foundation's i-Corps program to offer an intensive seven-week program for teams of university researchers, young entrepreneurs, and industry mentors.

Talent Growth and Expansion includes TGOs educational events such as lunch 'n learns, venture cafes, expert lectures, panel discussions, start-up weekends, founders forums, and other ad hoc events to create an entrepreneurial education ecosystem with Ohio University and the broader region. These often serve as education and entry points for prospective entrepreneurs.

Shared Services and Talent Development is representative of the challenges of engaging entrepreneurial support in a thin market. As such, TGO has engaged senior venture development mentors at universities and organizations out-of-state, retained local legal assistance, and collaborated internally to build a team of university and student researchers to assist TGO clients.

3.2 TGO as Entrepreneurial Ecosystem Catalyst

Beyond its efforts in entrepreneurial talent development, TGO also serves as an entrepreneurial ecosystem catalyst with tentacles within and outside the region. In addition to the public VC managed by TechGROWTH, TGO senior leadership at Ohio University created a partnership with Ohio State University to create the Ohio Innovation Fund. This $39 million early-stage venture capital fund is designed to be a source of follow-on capital for the best companies emerging out of the state's ESP programs. TGO has a proven track record of moving companies through the commercialization and funding continuum with $31.5M in follow-on equity capital on behalf of 61 companies–of which, 47% came from outside of the State of Ohio. This funding was sourced from organized angel funds (74%), private investors (14%), industry partners (7%), and other sources (5%).

TGO's has made progress on inclusion with respect to women, minorities, and low-income individuals. Eighty-five (85) percent of TGO clients are located in the rural region of SE Ohio, 10% of TGO clients have minority founders/minority-led (the region is only 5.9% minority in population), 10% of the TGO clients are women-led, and 21% of the TGO Funds portfolio companies have a woman founder.

Despite the challenges of operating in a rural environment with a less immediately qualified demand for VC, TGO has generated qualified demand and performs well relative to other ESPs in the state. This has been confirmed by regular assessments of the Ohio Third Frontier ESPs conducted by independent reviewer UVG Ltd. In fact, TGO and the "Big C" ESPs (Cincinnati, Cleveland, and Columbus) are original to the initial Ohio Third Frontier program. Other ESPs have been discontinued and restarted. As Table 1 indicates, based on a 2014 review, TGO has not performed as well with investment leverage given the type of companies, but has done well in cost and revenue leverage.

Table 1: Quantitative Comparison of ESP Metrics

ESP	Cost of Supporting Clients (Rank)	Investment Leverage (Rank)	Revenue Leverage (Rank)
JumpStart	$26,000/client (3rd)	30:1 (2nd)	27:1 (1st)
CincyTech	$21,000/client (2nd)	28:1 (3rd)	26:1 (2nd)
TechColumbus	$33,000/client (4th)	41:1 (1st)	25:1 (3rd)
TechGROWTH	$17,000/client (1st)	2:1 (6th)	22:1 (4th)
Rocket Ventures	$36,000/client (5th)	4:1 (4th)	21:1 (5th)
Accelerant	$54,000/client (6th)	3:1 (5th)	18:1 (6th)

Source: UVG Ltd. 2014. Entrepreneurial Signature Program Evaluators Preliminary Findings.

4 Discussion and Implications: TGO and Prevailing Literature

As discussed in the literature review, a common critique of public VC focuses on crowding out of private investment. However, many of these studies have been focused at the national level. As Table 2 indicates, the national VC by state remains heavily concentrated on the coasts with California, New York, and Massachusetts, respectively, acquiring the largest shares by deal and value. Ohio captured 1.5% of the deal share and 0.40% of the value share for VC investments in the United States in the 1st Quarter, 2017. Despite national level studies of public VC crowding out private investment, it is unlikely that TechGROWTH is crowding out private VC given the limited availability of VC in Ohio, and rural Ohio in particular. Instead of crowding out private VC, TGO fills an early stage gap in funding and increases the number of qualified deals for private investment consideration, serving to make those deals more attractive by helping to bake out risks, achieve validations, and pass commercialization milestones. TGO serves local private VC by sourcing, vetting, and by conducting due diligence on investment opportunities. Additionally, TGO role in organizing three successful angel funds in the region and role in sourcing and vetting investment opportunities for these funds further points to TGO's role in facilitating additional private investment rather than crowding out private VC.

Lichtenstein and Lyons (2001, p. 5) noted the need to "change the primary focus of enterprise development from providing services to developing entrepreneurs." They stress that developing entrepreneurs takes primacy over service provision. Additionally, expanding the population of entrepreneurs in the context of an entrepreneurial community is important (Lichtenstein and Lyons, 2001). TGO's focus on talent development not only provides quality demand of public VC, but also answers the call to build an entrepreneurial ecosystem. While TechGROWTH's public VC and service focus is limited to technology companies, the creation of an entrepreneurial platform allows the same staff to provide consulting and entrepreneurial development services to non-tech entrepreneurs through additional funding streams. TGO follows some of the best practices in entrepreneurial skill building via personal coaching to educate entrepreneurs and coaching from mentor and serial entrepreneurs (Kutzhanova et al., 2009). Prior literature has also found that counseling assistance, such as that provided by TGO, positively impacts survival rates and venture performance (Chrisman and McMullan, 2000, 2004; Chrisman et al., 2012).

Additionally, TGO has effectively addressed the "moral hazard" criticism of public VC as "free money" coming from public funds, which encourages abuse, lack of discipline, inefficiencies, and a failure to target funds on uses most aligned with generating returns. At the core of the "moral hazard" claim is the lack of responsibility stemming from 'no skin in the game' since there is allegedly a lack of fiscal accountability in the use of "free" funds while the deployment of funds with an equity price is thought to align all players with investment goals.

In the TGO program, one key strategy in which "moral hazard" consequences are mitigated and avoided is in the accountability of the program itself. The way in which the program measures success is wholly investment-governed and is measured in the leverage ratio. Every spend, whether in service cost or non-dilutive company funding ("free money") or actual pre-seed investment from the TGO fund, is evaluated in terms of its ability to enable follow-on resources to be acquired on behalf of the client.

Table 2: 1st Quarter 2017 Venture Capital by State

State	Deal Count	Deal Share	Deal Value (M)	Value Share
California	560	31.00%	$8,288.23	50.50%
New York	218	12.10%	$1,534.34	9.30%
Massachusetts	129	7.10%	$2,022.07	12.30%
Texas	100	5.50%	$468.91	2.90%
Washington	70	3.90%	$305.38	1.90%
Colorado	66	3.70%	$335.15	2.00%
Florida	63	3.50%	$244.19	1.50%
North Carolina	49	2.70%	$206.07	1.30%
Illinois	44	2.40%	$254.66	1.60%
Pennsylvania	40	2.20%	$148.26	0.90%
Georgia	32	1.80%	$334.82	2.00%
Maryland	32	1.80%	$218.42	1.30%
Virginia	32	1.80%	$204.27	1.20%
Utah	30	1.70%	$313.84	1.90%
Indiana	28	1.50%	$48.77	0.30%
Ohio	27	1.50%	$65.14	0.40%
All other states	36	16.30%	$1,420.55	8.50%
National Total	1808	100.00%	$16,413.00	100.00%

Source: Calculated from PitchBook-National Venture Capital Association 1st Quarter 2017 Venture Capital Monitor. (Pitchbook, 2017)

This sets up decision criteria for the deployment of public VC that aligns the "free money" with investment returns. It addresses the concerns of moral hazard by tying the program's success (and its prospects for continued funding) to effective use of funds, creates discipline, promotes efficiency, and provided for accountability.

Making the success of the public VC program hinge on the leverage ratio aligns the program with the goals of both the entrepreneur (to qualify for and obtain needed resources) and the State (to create successful ventures that make it to market, commercialize new technology, create jobs, and build the economy.)

Lastly, TGO's has a demonstrated track record of creating entrepreneurs, developing product lines, and leveraging state funding for additional resources for firms and the entrepreneurial ecosystem. This performance exceeds what the literature suggests for public VC in rural areas.

5 Conclusion

TechGROWTH represents an innovative model of combining rural entrepreneurial support services and public VC to create an entrepreneurial ecosystem. Consistent with Porter (1998), the organization's location within a university allows for leveraging of additional resources to build talented entrepreneurs in an otherwise thin market. Such talent development prepares emerging entrepreneurs to prepare to receive VC and other funding support. Contrary to suggestions in the literature, public VC in the TGO model does not appear to crowd out private VC, but rather serves to provide validation for private VC and other funding sources. In this manner, TGO provides a *slow yes*, nurturing framework for building entrepreneurial talent in a region with limited supply thereof. Furthermore, by undertaking partnerships to further develop related industries (e.g. the creation of Ohio Innovation Fund), TGO is catalyzing the growth of the overall entrepreneurial ecosystem.

The TGO experience offers a framework for deployment and entrepreneurship ecosystem development and enhancement in other economically challenged regions, such as declining post-industrial cities, rural areas, and developing countries. The success of such programs will require context dependent modifications

in these areas to meet the entrepreneurs where they are and assist them in preparing to receive additional investments and go to market.

References

Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5):893–921.

Beagle, B. (2016). Has Ohio conquered the third frontier? *Bluebag Media*, October 21.

Bologna, J. (2014). A spatial analysis of entrepreneurship and institutional quality: Evidence from US metropolitan areas. *Journal of Regional Analysis & Policy*, 44(2):109–131.

Brander, J. A., Du, Q., and Hellmann, T. (2015). The effects of government-sponsored venture capital: International evidence. *Review of Finance*, 19(2):571–618.

Chrisman, J. J. and McMullan, W. E. (2000). A preliminary assessment of outsider assistance as a knowledge resource: The longer-term impact of new venture counseling. *Entrepreneurship: Theory and Practice*, 24(3):37–53.

Chrisman, J. J. and McMullan, W. E. (2004). Outsider assistance as a knowledge resource for new venture survival. *Journal of Small Business Management*, 42(3):229–244.

Chrisman, J. J., McMullan, W. E., Kirk Ring, J., and Holt, D. T. (2012). Counseling assistance, entrepreneurship education, and new venture performance. *Journal of Entrepreneurship and Public Policy*, 1(1):63–83.

Cumming, D. (2007). Government policy towards entrepreneurial finance: Innovation investment funds. *Journal of Business Venturing*, 22(2):193–235.

Cumming, D. J. and MacIntosh, J. G. (2006). Crowding out private equity: Canadian evidence. *Journal of Business Venturing*, 21(5):569–609.

del Palacio, I., Zhang, X. T., and Sole, F. (2012). The capital gap for small technology companies: Public venture capital to the rescue? *Small Business Economics*, 38(3):283–301.

Delgado, M., Porter, M. E., and Stern, S. (2010). Clusters and entrepreneurship. *Journal of Economic Geography*, 10(4):495–518.

Feldman, M. P. (2014). The character of innovative places: entrepreneurial strategy, economic development, and prosperity. *Small Business Economics*, 43(1):9–20.

Goetz, S. J., Partridge, M., Deller, S. C., and Fleming, D. A. (2010). Evaluating US rural entrepreneurship policy. *Journal of Regional Analysis & Policy*, 40(1):20–33.

Grilli, L. and Murtinu, S. (2014). Government, venture capital and the growth of European high-tech entrepreneurial firms. *Research Policy*, 43(9):1523–1543.

Kutzhanova, N., Lyons, T. S., and Lichtenstein, G. A. (2009). Skill-based development of entrepreneurs and the role of personal and peer group coaching in enterprise development. *Economic Development Quarterly*, 23(3):193–210.

Leicht, K. T. and Jenkins, J. C. (1998). Political resources and direct state intervention: The adoption of public venture capital programs in the American states, 1974–1990. *Social Forces*, 76(4):1323–1345.

Leleux, B. and Surlemont, B. (2003). Public versus private venture capital: seeding or crowding out? A pan-European analysis. *Journal of Business Venturing*, 18(1):81–104.

Lerner, J. (1999). The government as venture capitalist: The long-run impact of the SBIR program. *Journal of Business*, 72(3):285–318.

Lerner, J. (2002). When bureaucrats meet entrepreneurs: The design of effective public venture capital programmes. *Economic Journal*, 112(477):73–84.

Lerner, J. (2009). *Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed–and What to Do About It*. Princeton University Press, Princeton.

Lichtenstein, G. A. and Lyons, T. S. (2001). The entrepreneurial development system: Transforming business talent and community economies. *Economic Development Quarterly*, 15(1):3–20.

Munari, F. and Toschi, L. (2015). Assessing the impact of public venture capital programmes in the United Kingdom: Do regional characteristics matter? *Journal of Business Venturing*, 30(2):205–226.

Ohio Third Frontier (2017). Entrepreneurial services provider program. *Ohio Development Services Agency*.

Pitchbook (2017). 1Q 2017 Pitchbook-NVCA Venture Monitor. *Pitchbook.com*, April 4.

Porter, M. E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, 76(6):77–90.
Schumpeter, J. A. (1934). *Theory of Economic Development*. Harvard University Press, Cambridge.
Uzuegbunam, I., Liao, Y.-C., Pittaway, L., and Jolley, G. J. (2017). Human capital, intellectual capital, and government venture capital. *Journal of Entrepreneurship and Public Policy*, 6(3):359–374.
Walzer, N. and Athiyaman, A. (2007). Introduction and overview. In Walzer, N., editor, *Entrepreneurship and Local Economic Development*. Lexington Books, Lanham.