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Incentives for Entrepreneurial Firms

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Ewing Marion Kauffman Foundation, Smart Incentives

August 2021

Online at https://mpra.ub.uni-muenchen.de/109173/
MPRA Paper No. 109173, posted 25 Aug 2021 04:35 UTC

INCENTIVES FOR ENTREPRENEURIAL FIRMS
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This is a publication funded by the Ewing Marion Kauffman Foundation utilizing content and data from multiple sources and external contributors. The contents of this publication are solely the responsibility of the authors. Every effort has been made to verify the accuracy of the information contained herein, and it is believed to be correct as of the publication date. Nonetheless, this material is for informational purposes, and you are solely responsible for validating the applicability and accuracy of the information in any use you make of it.

This report was prepared by Smart Incentives in May 2020.
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Acknowledgments: We thank Brian McGowan, Erik Pages, and E.J. Reedy.

APPENDIX A: SUMMARY OF TECHNICAL AND POLICY ISSUES

The appendices supporting *Incentives for Entrepreneurial Firms* provide a deeper review of the technical and policy-related issues that affect consistent, accurate, and policy-relevant analysis of U.S. state and local economic development incentives for entrepreneurial firms. The appendices document pertinent studies and analyses from peer-reviewed research articles and reports as well as state government entrepreneurship incentive program evaluations. The intent of the appendices is to describe the types of incentive programs and to review the effectiveness of the incentives on entrepreneurship, with attention to the impact on the firm, the entrepreneur, and the place – location or geography. Where possible, the appendices also consider any implications for entrepreneurship diversity and for equitable and inclusive results. Finally, these appendices propose steps that could enhance and improve both the study of and the effectiveness of state economic development incentives for entrepreneurial firms.

The appendices classify the range of incentives for entrepreneurial firms into two categories: 1) fiscal and financial programs, and 2) service programs. Although the two categories are not completely distinct, both capture the philosophy, practices, and essential characteristics that represent the landscape of incentivizing entrepreneurship with economic development policy.

The review of entrepreneurial incentives details technical and policy issues that affect the determination of incentive effectiveness. Appendix B commences with a discussion of the overarching definitions of entrepreneurship incentive research and the challenges facing researchers. The research challenges highlight policy and conceptual issues and data limitations hampering the systematic study of incentives for entrepreneurial firms. The policy and program challenges include the lack of consistent, long-term programs, short reporting time frames compared to the time needed to measure effect, and multiple upstream policy issues, such as policy design and metrics, legislative involvement and rulemaking, implementing organizations, and administrative purview and reporting. Programs also often have limited disaggregated data on the firm, entrepreneur, and place, which impedes meaningful internal and external efforts to monitor outcomes. Finally, researchers must work with a lack of comprehensive data, including substantial variation in the definition of entrepreneurship which often results in inconsistent data collection, methodologies, and findings.

Appendix C provides a detailed discussion of specific incentive tool categories (fiscal, financial, and services) with respect to the research findings on the firm, entrepreneur, and place/geography. The variation in findings across the documented academic and policy research highlights the challenges facing rigorous policy analysis. Although entrepreneurship is often a component of economic development strategies, the lack of consistent language, data collection, and reporting methods diminishes the ability to make confident policy statements that can guide concerned policymakers.

Appendix C concludes with a discussion of “What’s Needed to Know What Works?” It identifies the policy and data gaps, presents methods economic development policymakers and

administrators can use to address them, and suggests that shared leadership and policy efforts could support the development of guidelines, standardization, and data collection assistance to improve the effectiveness of state economic development incentives for entrepreneurial firms.

APPENDIX B: RESEARCH CHALLENGES

Appendix B provides a review of the research challenges facing systematic and rigorous analysis of incentives for entrepreneurial firms. Before turning to specific challenges, it provides an overview of the body of literature and a baseline for the definitions that guide the appendices' review of existing research.

Literature and Definitions

The entrepreneurship incentives research documented in this appendix represents peer-reviewed articles, reports, and program evaluations by state government programs or consultants. Academic and economic development organizations'[1] databases and a variety of search terms[2] were used to identify the research documented. The review included a number of academic fields (e.g., business, economics, policy analysis, public administration) in order to glean findings across disciplinary approaches and methods.

For the purpose of standardizing the discussion of the research, the following definitions guided the search for academic and other incentive policy evaluations:

Entrepreneurial firms are less than five years old and are younger, opportunity-seeking, and job-creating. The definition recognizes a continuum of firms, which is appropriate given the range utilized in defining entrepreneurship in economic development incentive policy. Entrepreneurship is distinct from small business, although many programs choose to conflate the two types of companies. Main Street, mom-and-pop, and local-serving (markets) firms are commonly profiled as or undifferentiated from entrepreneurship even though these businesses do not typically focus on growth and job creation – traits that are associated with entrepreneurship. However, for the same reasons that the main report includes small business programs managed by economic development organizations, many of the programs examined in the academic and policy research found in this appendix do not differentiate small business results from entrepreneurship.

Incentives are tools that influence business decisions in order to spur the growth of companies and jobs in specific locations and achieve community goals (Harpel 2016; Tavares-Lehmann et al. 2016). In practice, however, incentives often encompass a broader range of services, programs, and financial offerings that are intended to alter, reward, or subsidize an action or behavior (Indiana Legislative Services Agency 2014). Many incentives for entrepreneurial firms fall into this wider category. They do not appear designed to "influence business decisions" except in the most general sense.

[1] The database searches included NBER, ProQuest, ABI/INFORM, JSTOR, EconLit, Business Source Complete, C2ER State Business Incentives Database (http://www.stateincentives.org/), and NCSL State Tax Incentive Evaluations Database (https://www.ncsl.org/research/fiscal-policy/state-tax-incentive-evaluations-database.aspx).
[2] Search terms included: entrepreneurship, innovation, incentives, startups, growth/early stage/new firms, tax incentives, incubators, accelerators, angel/venture capital, equity investment, grants, loans, and small business.

Fiscal and financial incentives are tools and resources that provide, subsidize, and/or expand direct or indirect access to the necessary and appropriate capital to scale innovation and entrepreneurial activities. These fiscal and financial resources enable and support activities such as the commercialization of basic and applied research emerging from universities and private institutes; the conception, prototyping, piloting, and producing of new products and processes; and work with existing products and services by new, existing, and small firms. Financial incentives include direct assistance such as grants, subsidies, loans, loan guarantees, and equity participation that helps with project or company financing. Fiscal incentives include tax provisions for qualified activities that represent government revenue foregone, rather than direct assistance.

Services incentives are resources and incentives that provide and subsidize access to expert/specialized support (firm formation, capital access, mentoring, and entrepreneur consultation/training), innovation-oriented professional services (legal, accounting, marketing, and assistance with program applications like state and federal government grants and procurement), and other resources needed by an entrepreneur and/or a new or growing firm (shared spaces, overhead, etc.).

Overarching Research Challenges

This survey of studies and reports reveals a number of challenges facing researchers in this field. The first overarching challenge is the limited number of studies that specifically examine the effect of state and local incentives on new firm formation and entrepreneurship. This reality does not reflect the stated intentions of economic development policymakers and economic thinkers who claim the benefits of entrepreneurship and its importance in increasing innovation, enabling job growth, and ensuring churning, dynamic economies. As discussed in the main body of the report, entrepreneurship is likely a small component of economic development policy due to timing and policy tools. The long-term nature of the process of seeding small firms with the hope of fostering large, dynamic growth in the future requires program and budget commitments that extend beyond electoral cycles. And the policy tools available to governments may not be those best suited to prime entrepreneurship. The lack of studies could suggest that academics note these issues and focus instead on the microeconomic factors inside the firm and the entrepreneur's world, leaving the macroeconomic role of entrepreneurship in economic development policy understudied.

The second overarching challenge is the lack of comprehensive data. The limited data measuring both program objectives and outcomes lead many researchers to make heroic assumptions and decisions about database usage and proxies in their analyses. It is apparent from the review of the literature that if the data were more available and methodical, the ability of researchers and governments to effectively evaluate the effect of incentives would likely increase. Additional data availability could also open such rigorous analysis to disciplines beyond entrepreneurship, business, and economics. Researchers interested in public policy and administration, for example, may be more inclined to research the macroeconomic policy question of "What works?" for entrepreneurship and economic development.

The remainder of the section on entrepreneurship incentives research summarizes the most pressing research challenges that inhibit rigorous and more regular, longitudinal analysis of entrepreneurship incentives: *policy, programs, and data*.

Policy and Program Challenges

Lack of consistent and long-term policies and programs

There are a large number of standalone or integrated entrepreneurship incentive programs at various levels of government (federal, state, and local). Even universities have a preponderance of entrepreneurship efforts. The lack of evaluation and analysis of program success, therefore, is troubling. Furthermore, programs are often redesigned and new programs are frequently created when a new government administration takes power or an economic development organization completes its economic development strategic plan. These programmatic changes only make evaluation and analysis efforts more difficult. As data collection time periods for many analyses of incentives are driven by administrative changes, they are often not long enough to see robust usage of the program or to ensure enough years of data for reporting. Consequently, these analyses regularly report that programs have no effect (Godfrey, Allen, and Benson 2020; Figueroa-Armijos and Johnson 2016). These issues directly impact the accountability and transparency of programs and limit the determination of their effectiveness, value to the entrepreneur and the entrepreneurship ecosystem, and ability to help achieve the goals of innovation, job creation, and dynamic economies.

Program roadblocks

Design

The design and language of both legislative criteria and program criteria from the implementing agencies often seem to be roadblocks for incentive utilization. For example, Oklahoma's tax credit for sponsors of incubators also offered a tenant firm tax break.[3] Although the sponsor credit has been repealed, the tenant credit remains. The calculation of an annual economic and tax impact of the tax incentive on incubators, however, is impossible due to data limitations and the fact that many tenant companies were too small to claim the exemption (Roggow and Brown 2018).

This appendix offers state economic development policymakers insights that they can use to improve program design and effectiveness. For example, Howell's (2017) research suggests that providing grants for small, young firms on a one-time basis is more productive than giving fewer, larger grants that follow firms through multiple stages of technology development. Pairing such one-time grant programs with intergovernmental funds, then, could hold value. Another

[3] Sponsors were exempt from state income taxes on income earned from rental fees or other incubator-related income; tenants continue to be exempt from state tax liability on income earned as a result of tenancy for up to 10 years, even after the tenant leaves the incubator (Roggow and Brown 2018).

study recommends that states could more effectively use their incentive dollars. A better balance in their economic development spending portfolios between traditional business attraction activities and support for entrepreneurial development could have a strong effect on employment (Donegan, Lester, and Lowe 2019). This "balanced portfolio" approach would spread funds across large-firm industrial recruitment as well as programs that help entrepreneurs and small businesses, such as technology transfer, R&D, technical assistance, and business procurement.

Entrepreneurship characteristics: Firm, entrepreneur, and place

Firm and entrepreneur

State economic development organization program reports are often limited to high-level summary statistics and lack comprehensive, granular data on incentive beneficiaries, such as the characteristics of the firm, demographic characteristics of the entrepreneur, and the location of the firm. These deficits are another example of the mismatch between the reality and the intentions articulated in program language, which often emphasizes the importance of supporting entrepreneurs and creating successful startups.

This lack of data collection for important characteristics and the disaggregation by categories have a policy impact on equitable and inclusive entrepreneurship. Research suggests, for example, that diversity and inclusive talent pools provide a competitive advantage to firms because of social complexity at the firm level (Herring 2009, 220).[4] Greater diversity in founders and entrepreneurs likely improves the chances of a region's economic success because inclusive environments create higher upward mobility and faster rates of per capita income growth. Economic development programs should collect, report, and analyze these data in order to monitor outcomes and inform programs' necessary evolution in order to support inclusive entrepreneurship.

Place

The same lack of program data inhibits understanding of entrepreneurship incentives' effects on types of places – rural, urban, distressed, etc. The dearth of geographic information and data concerning the type of place in reporting impedes the ability to achieve a greater understanding of incentives' locational impacts and to provide future policy guidance. A few studies do examine regional economic impact or a metropolitan area's ecosystem (e.g., venture capital), yet they often do not track firm details and outcomes. Thus, they are unable to inform policymakers about the micro "inside the firm" and macro "regional" effects of incentives on entrepreneurship.

A recent study of life science clusters presents some rare geographical analysis that underscores the need for such investigation and reporting to guide policy decisions (Godfrey,

[4] Racial diversity is associated with increased sales revenue, more customers, greater market share, and greater relative profits. Gender diversity is associated with increased sales revenue, more customers, and greater relative profits.

Allen, and Benson 2020). Understanding the interrelationship between entrepreneurship and location could inform economic development policymakers regarding ways to enhance a location and the best next steps for them to take. For example, the research suggests that communities *without* a life science cluster should not attempt to compete with successful clusters in Boston's Route 128 or San Francisco's Biotech Bay. Instead, regions lacking clusters would best be served with a 'micro cluster' approach that focuses on the strengths and assets of the existing ecosystem. This tactic would include building sufficient and well-developed resources for a specialized technology or product area by encouraging universities to focus less on building strong colleges (e.g., life science or medicine) and to specialize more on outstanding departments (e.g., genetics or ophthalmology) that benefit a micro cluster (Godfrey, Allen, and Benson 2020, 140).

Only with comprehensive data collection and reporting on ecosystem-relevant outcomes for the firm, entrepreneur, and location can economic development entrepreneurship policymakers learn how to further develop incentives programs and improve their effectiveness.

Legislation, implementation, and administration

Legislative involvement and rulemaking bodies directly affect the capacity of program language and criteria to target entrepreneurship. At the two extremes, broad entrepreneurship definitions are used to suit political ends, and narrow definitions limit the uptake and usage of the program and can even lead to repeal (State of Rhode Island, Department of Revenue, Office of Revenue Analysis 2018). Additionally, the inclusion of entrepreneurship in government programs can meet skepticism and criticism from legislators with differing opinions on the definition entrepreneurship, its role in the economy, and/or its importance to a public sector growth strategy.

The variation across government implementing and administrative agencies affects the effectiveness of incentives, but is not often researched. An agency's capability, capacity, and suitability for overseeing a program shed light on internal management and its alignment of the entrepreneurship programs with its broader regional development goals, such as growth in specific sectors, promotion of specific types of innovations, and societal benefit. For state governments that fund state-sponsored incubators and accelerators to deliver entrepreneurship programs, these contracted external organizations also have influence over the specific goals of the programs, the services provided, or ventures selected. The sponsored organization is likely more concerned with narrower entrepreneurship goals than the government, helping the entrepreneur, creating spin-off firms, and/or maximizing financial returns from commercialization projects (Rasmussen and Gulbrandsen 2012). Thus, the government's indirect control over the entrepreneurship program paired with the government's broad entrepreneurship goals could be problematic and have implications for a government-funded organization's ability to help achieve both micro "inside the firm" and macro "regional" entrepreneurship goals.

Lack of Comprehensive Program Data on Firm, Entrepreneur, and Place

The majority of the existing data are high-level, summary program statistics. Most programs at the federal level, and even more at the state and local level, lack the comprehensive, timely, reliable, and accurate data that are necessary to determine ways for incentives to have direct and/or indirect effects on entrepreneurship. The limited number of rigorous academic investigations of entrepreneurship incentive program effectiveness is likely a reflection of this reality.

The current landscape requires researchers to create methods to collect and merge various datasets and make assumptions that may affect the replicability and applicability of results. For example, an examination of the commercialization of university-licensed life-science startups required such techniques in order to go beyond the metrics of company creation or licensing that are typically reported (Godfrey, Allen, and Benson 2020). The extra effort and methodology led to important findings. The authors suggest that existing commercialization activity did not match the success of reported metrics because many of the "startups" had neither employees nor business expertise. The analysis offers an important policy critique: if economic development is the goal, technology transfer should not be about startup formation but, rather, about long-term economic development. Thus, the data collected should be economic impact data, such as startups' number of employees, total wages, other expenditures, venture capital raised, and any liquidity events (IPOs and acquisitions). The sophistication of the methods and assumptions were necessary to shed light on the effectiveness of previously reported metrics. For many programs, however, this analysis is not possible.

An incentive that promotes a variety of services and financial tools under a single umbrella program, such as an incubator, is also problematic if metrics are not carefully identified and data are not collected to evaluate the distinct services or financial assistance tools within the program. Thus, the effectiveness of specific services is not well documented in the literature, and even the financial data are often too limited if they only report the number of disbursements and do not include the impact on the recipient.

Firm and entrepreneur

More confounding is the lack of comprehensive data tracking the characteristics of the incentive beneficiaries – firms, investors, etc. Data should include entrepreneur characteristics and startup/firm information (e.g., start date, capital, patents, employees, etc.). Data should also track firm histories to understand the effects of the incentive. The absence of these data points precludes a robust understanding of the different challenges entrepreneurs may face, the trajectories of the firms (revenues, survival, successes, failures, IPOs, acquisitions, employee growth, etc.), and their economic impact.

Wisconsin's Entrepreneurial Micro-Grant serves as an example of the data limitations for evaluations that result from reporting over-simplified program statistics. The evaluation of the state's programs only reported data for aggregated categories (all grants and loans, all tax credits, bonding authorities, etc.), such that the impact of the Micro-Grant was not accessible

beyond basic program statistics regarding the number of grants and total dollar amounts. Reporting of general aggregated categories has limited value in determining the effect of the program on entrepreneurship (Wisconsin Legislative Audit Bureau 2019).

Place

The lack of geocoding of entrepreneurship or startup activity impairs the analysis of locational effects during the life of the firm and results in studies measuring indirect effects. For example, many studies with a geographic component simply tally the number or percentage of firms by types of place. Economic impact studies report the policy's macroeconomic effect on the region or state (employment rates, job growth, income, regional GNP, etc.), but these analyses cannot link the effects directly to new firm starts alone.

Economic impact studies also face limitations because programs rarely have disaggregated data that would provide clarity on the type of entrepreneurship capital deployed – an essential component of a regional economic impact model. One study estimated the effect of R&D tax credits across multiple states, but the researchers had to alter their assumptions because they were missing years of data. The incomplete breakdown of local versus federal grants in the dataset meant that they could only utilize private capital leverage in the models (Tuomi and Boxer 2015).

Thus, the lack of comprehensive data limits investigations of both micro "inside the firm" and macro "regional" effects of incentives on entrepreneurship. It also creates a great number of inconsistencies in approaching the basic question of effectiveness.

Defining entrepreneurship

The lack of data is further muddied by the absence of a consistent, standardized, and clear definition for entrepreneurship. Comparisons of findings across programs and studies are difficult and create confusion about the extent to which programs are focused on and able to affect entrepreneurship.

The conflation of entrepreneurial new businesses with slower growth small businesses is also problematic. Many economic development programs refer to entrepreneurial new businesses, but it is very clear that all small businesses could qualify because many programs do not have criteria for business age. These unclear standards for inclusion make program comparisons and quality research on outcomes difficult.

Firm

Conceptual definitions of entrepreneurship in the academic and evaluation research literature vary and depend on the program criteria, available data, and technique. Definitions include, for example, new firm starts, firms less than five years old, firms with less than a certain number of employees, firms with less than a threshold amount of revenue/sales, and firms that have never had a round of equity investment. At times, there is an assumption that the desired type of entrepreneurship occurs in a particular technology and/or innovation sector. These program

criteria, however, often do not explicitly limit the age of the firm and thus end up serving incumbent, older firms with more awareness of incentives and capacity to apply for incentives.

A review of state governments' criteria for fiscal and financial incentive programs provides further context for this issue and exhibits the wide range of entrepreneurship definitions. Some define entrepreneurship by *firm age*, often using five years as the threshold. Many others, however, favor an entrepreneurship definition tied to number of employees or use the SBA's definition that varies by industry and is based on one of the following: annual receipts or average number of employees. Several programs focus on new businesses/startups and tie the definition to future job growth and/or a certain number of hires. The term early-stage is typically based on revenue/gross income and level of investment received (equity in excess of some dollar threshold).

Programs define technology-focused entrepreneurship in many ways. A firm's benchmarks for the product or service by innovation phase denote the importance of the firm having passed the idea phase or having a committed management team and active engagement of co-founders who work in the business at least half time. More generic is the industry type definition or the mere label and categorization of innovation, advance, and growth industry/firm. Such incentive programs often have qualifiers such as R&D commercialization, technology transfer, innovative, or proprietary product/service/technology.

Characteristics of the entrepreneur and place

Finally, many states also use characteristics of the entrepreneur as criteria in an attempt to address underrepresented ownership categories such as entrepreneurs of color, or women, veteran, or disabled business owners. Owners with less wealth or underserved small businesses may also be included in the definition. The latter ties more directly to the stated location attributes or specific locations (an economic development zone, area of high unemployment, etc.). One example ensures that a firm beneficiary has a state-based headquarters and the desire to grow within the state and/or that a percentage of employees live in the state. However, this use of location does not help distinguish interregional impact of the incentive.

Academic studies face these multiple program definitions across states and across programs even within the same state. At the same time, they must fit the research question into a body of existing literature tied to the microeconomic theory of the firm or macroeconomic theory of regional economic development and growth, and they must utilize terms from that literature. The academy's desire to speak to these theories creates cumbersome issues for understanding and comparing research and evaluation findings.

Making up for limited data

The limitations of the data tend to require analysts to aggregate additional datasets, utilize varied definitions/proxies across datasets, make many data assumptions, and use various techniques (predictive, instrumental variables, imputations, etc.) to attempt the analysis. The

relaxation of definitions, reliance on matching across multiple datasets, and supplementation of survey data represent just some of the attempts to fill the data gaps.

For example, a comparative analysis of angel tax credit (ATC) programs from 1988-2018 in 31 states indicates that the range of definitions for an entrepreneurial firm and its eligibility presented a challenge for the study (Denes, Wang, and Xu 2019). The researchers identified the following variations in the cap for eligibility:

- age cap from three to 12 years
- employment cap from 25 to 100 employees
- revenue cap from $150,000 to $20 million
- asset cap from $2.5 to $50 million
- variation in the tax credit percentage based on firm characteristics (biotech, healthcare, rural, or years of investment)
- prior external financing cap from $1 to $10 million

More problematic, however, is that many states do not even have such caps on the books. These variations, accompanied by limited beneficiary firm and investor history, present challenges for consistent and reproducible findings.

Researchers attempting to fill the holes may aggregate supplemental datasets, but this approach often adds layers of proxies that result in a further expansion of the definition of entrepreneurship. A study claiming to examine young, entrepreneurial firms, for instance, sufficed with a young firm proxy that included firms with as many as 20 employees and no firm age (Howell and Mezzanotti 2019).

A second example is an analysis of an angel tax credit that supplemented insufficient program data with a survey of investors to estimate any change in investors' behavior and their likelihood of investment. The survey analysis provided another frame to understand the impact of the incentive on different types of startups and compare it to their experience in a normal functioning market. However, the survey data limits the study's replicability and its conclusions about the ATC's effectiveness (Economic Development Research Group, Inc. and Karl F. Seidman Consulting Services 2014).

For the creative researchers digging through data for a comparative analysis, many incentive programs lack a central state or national database that is well maintained or representative of the universe. A few of these databases contain data about the incubators' mix of services and programs and the performance of the incubators' start-up tenants. However, the data do not track which services each start-up utilizes, making analysis of any one incentive or program impossible. The results are thus global and examine general questions about whether incubated firms have better performance and survival rates than non-incubated firms.

A recent compilation of administrative data could prove to be a standardizing step since the dataset would encompass a universe of startups (Fairlie, Miranda, and Zolas 2019). The panel dataset enables a comprehensive universe to study entrepreneurship, job creation, and

decisions of both non-employer and employer startups because it includes data on employees, payroll, and outcomes (employees, revenues, survival, etc.). Several welcome attributes include the possibility to link founder characteristics and employee characteristics to startups, and the ability to alter the definition of entrepreneurship based on classifications of businesses, such as non-employer or employer, and incorporated, S corporation, partnership, or sole proprietorship.

Economic development program data collection must make similar advances to be able to track incentive effects. The need for data and standardization are of the utmost importance to understanding the role of economic development incentives on entrepreneurship.

Summarizing Research Challenges

The limitations that academic research or state program evaluations identify across fiscal, financial, and service programs are similar. The lack of consistent programs, design, and reporting of comprehensive and granular data (e.g., program offerings, firm characteristics, and outcomes, etc.) make it difficult to unravel comparative correlative effects across studies. The paucity of academic studies indirectly suggests that there are a noteworthy and diverse challenges in attempting to conduct a study to meet rigorous methodological standards.

The list below summarizes the policy, programs, and data that are needed to better determine what works for entrepreneur-focused economic development.

- Policy and Programs
    - A consistent policy with a long-term view and commitment
    - Program design, implementation, administration, data collection, and reporting that are aligned with policy and program goals
- Data
    - Standardized data collection, comprehensive metrics, and granular data that capture the inputs, outputs, outcomes, and impacts of a program
    - Clear definitions of entrepreneurship and appropriate metrics that are aligned with policy and program goals

Each of the above create conditions to improve comparative analysis and a concrete understanding of policy implications, from regional effects to investor and firm outcomes.

APPENDIX C: RESEARCH FINDINGS AND CONCLUSIONS

Appendix C provides a detailed discussion of specific incentive tool categories (fiscal, financial, and services) with respect to the research findings on the firm, entrepreneur, and place/geography. The variation in findings across the documented academic and policy research highlights the challenges facing rigorous policy analysis. Appendix C concludes with a discussion of "What's Needed to Know What Works?" and highlights the policy and data gaps, identifies how economic development policymakers and administrators can address them, and suggests that shared leadership and policy efforts could support the development of guidelines, standardization, and data collection assistance to improve the effectiveness of state economic development incentives for entrepreneurial firms.

Fiscal and Financial Incentives

The majority of economic development programs for entrepreneurship fit into the category of fiscal and financial programs. These tools and resources are incentives that provide, subsidize, and/or expand direct or indirect access to the type of capital that entrepreneurs need to scale innovation and conduct entrepreneurial activities. Due to many of the research challenges discussed above, there are few academic studies documenting the effects of fiscal and financial incentives on entrepreneurship outcomes. For state government programs, most information comes from traditional annual reports that tend to offer basic, high-level program statistics and aggregates with little detail and few metrics to determine the effectiveness of programs.

The review of the research on fiscal and financial incentives begins with a discussion of the provision and subsidization of capital through programs intended to stimulate investment in entrepreneurship from the private market (tax expenditures, equity investment, and grants). The section concludes with a deeper look at a subset of fiscal and financial programs that enable financial support of innovation activities within the innovation and entrepreneurial ecosystem. These efforts include the commercialization of basic and applied research emerging from universities and private institutes; the conception, prototyping, piloting, and producing of new products and processes; and new, existing, and small firms working with existing products and services.

In general, few fiscal and financial incentives are found to be consistently relevant to entrepreneurship activity across the documented academic and state program analyses. Angel tax credits (ATC) were most likely to be found have a positive impact on entrepreneurship, though findings are mixed. Findings for research and development (R&D) tax credits, while less positive overall, had thought-provoking findings for place and for departures of employees to entrepreneurship. Some tax incentives, such as R&D and investment tax credits, are primarily taken by large, well-established firms rather than young, entrepreneurial firms. Direct entrepreneurship analysis, therefore, is difficult. This issue is relevant to many of the reviewed studies that find incentives have a negative impact on startup rates and may crowd out their activity. These studies are relevant to this appendix because these types of tax credits can alter investor behavior in entrepreneurial firms and/or help subsidize certain firm actions.

Angel Investment and Tax Credits

Firm

Of the finance and capital tools listed above, there was more positive evidence for entrepreneurship from angel investing and angel tax credits (ATC) across both academic and program evaluations. Research documents the importance of venture capital (VC) investments in the early development stages of public companies during the past 40 years. VC resulted in 38% of the total 8.1 million employees in public companies founded after 1974, accounted for 58% of the market capitalization, and 83% of R&D expenditures (Gornall and Strebulaev 2015). More specifically, angel-funded startups are 14% to 23% more likely to survive for the next 1.5 to 3 years while growing their employment by 40% relative to non-angel-funded startups. In addition, angel-funded startups have a greater likelihood of successful exits, increasing from 10% to 17% (Lerner and Schoar 2016).

Research on ATCs identifies the following positive firm outcomes:

- entrepreneurship activity (new business development from the historical Kauffman Index of Entrepreneurial Activity) increases within two years of the tax credit (Bell, Wilbanks, and Hendon 2013)
- job creation and retention (Kousky and Tuomi 2015)
- place effects of total economic impact to states including a boost in leveraged capital, local employment, earnings, and value added (Tuomi and Boxer 2015)[5]

New Jobs Created by Firms in State Tax Credit Program		
State	**New Jobs Per Company**	**Retained Jobs Per Company**
Louisiana	2.8	4.6
Maine	11.3	28
Maryland	6.9	4.9
Minnesota	2.8	(not reported)
South Carolina	3.8 (new and retained)	(not differentiated; included in all new jobs)

Source: Kousky and Tuomi 2015.

A state evaluation by an external consultant showed Minnesota's ATC increased investment. Most benefits came after the first three years of the credit due to the costs of the tax expenditure during the first three years. The evaluation reported that the ATC paid for itself in ten years, with the state earning $0.61 of every $1 forgone (Economic Development Research Group, Inc. and Karl F. Seidman Consulting Services 2014, 3). To provide greater depth than the program data allowed, the evaluation methodology included a survey of qualified investors to determine the ATC investment's effect on businesses that qualify as minority- or women-qualified businesses

[5] The Revenue Departments in the states of Maryland, Maine, Minnesota, and South Carolina found these benefits of their ATC programs, as documented by Kousky and Tuomi (2015).

and specific industries while providing data on the geographical distribution of the investment (see discussion below in section on place).

Surveyed qualified investors claimed that the ATC program increased their awareness of investment opportunities in minority- and women-owned businesses, with 12% reporting an increased awareness of minority-owned businesses, and 14% noting an increased awareness of women-owned businesses. These data enabled estimates of increased investment due to the ATC. For example, although minority-owned businesses only received 1% of the program's Qualified Investment and women received 2%, there was an estimated increase in investment of $616,000 in minority businesses based on extrapolated survey results. This amount is attributable to the ATC and would not have been invested if the credit did not exist.[6] For the industry effect, 52% of surveyed qualified investors reported increased awareness of new technologies and industries. The most common industry groups cited were biotech/healthcare/medical devices (57%) and information/communications (17%).

Across the documented research, however, there was no conclusive evidence of ATC's effectiveness. A set of studies showed an increase in some measures of angel activity (number of angel investments and average investment size), but no measurable effects of the ATC on local entrepreneurial activity or beneficiary company outcomes. The conclusions of these studies suggest that states need to track investment better in order to understand the nuances of these discrepancies. Such tracking could determine if the negative findings were a result of ATC-induced investments flowing to lower-quality startups with less experienced entrepreneurs or the fact that the investors were new and inexperienced in selecting quality startups. Tracking would also uncover if executives at the beneficiary companies were using the ATC and not likely making the same investment calculus as they would on other startups (Howell and Mezzanotti 2019; Denes, Wang, and Xu 2019).

Internal program design and screening of companies and investors to ensure funds flow to the intended firms could also possibly remedy the other problems. Many states have criteria stating that the ATC is to promote high-growth, innovative entrepreneurial activity. However, Howell and Mezzanotti found several interrelated problems. First, only 9.5% of beneficiary companies were high-tech innovative companies and had no insider investment or previous external equity. Second, 90% of beneficiary companies fell into at least one of three categories: a corporate insider received a tax credit; the company previously raised external equity; or the company was not in a high-growth sector (Howell and Mezzanotti 2019).

These findings raise questions about economic development policymakers' claims that the ATC promotes investment in high-growth entrepreneurship. A better definition of high-growth, innovative firms is essential, but it is difficult to create, in part because of the changing nature of innovation and firm lifespans. In this highly competitive and evolving environment, for example, firms that do not produce tangible products and are information providers, suppliers, and compilers are considered "information technology" firms. These firms can help with marketplace

[6] Data availability limited this same analysis for women-owned businesses.

development when their platforms or information are sold to other firms. It is challenging, however, to measure the exact value added from information technology firms in the same way that the value added by manufacturers can be quantified. The interaction of these technical issues suggests that programs may need to assess the definition of a high-growth or high-tech firm more regularly in order to meet policy and program goals. It also underscores the critical need for valid, reliable, and consistent definitions across economic development programs and agencies collecting labor and firm characteristics (Independent Fiscal Office 2020).

A final critique of merit is that ATCs are designed to fill a gap in access to capital. If so, programs should ensure and monitor the flow of investment to high-growth companies that cannot receive traditional financing. Such action would decrease competition for the tax credit and enhance the ability to assess the effectiveness of ATC programs for high-growth firms.

Even within the body of studies offering critiques of the ATC, there were data limitations that raised questions regarding the ability of such research to assess the effectiveness of these entrepreneurship incentives. For example, the Howell and Mezzanotti study mentioned above aggregated and matched cases across multiple datasets because of the absence of program data tracking firm histories, outcomes, and investor information, yet, as noted earlier, their young firm proxy included firms with as many as 20 employees and no firm age (Howell and Mezzanotti 2019).

Place

Research findings about place and location are more likely to report on the distribution of investment. For example, Minnesota's ATC evaluation's use of a supplemental survey of qualified investors (described above) enabled an analysis of geographical distribution. Investors reported greater interest in urban areas, with 68% of investors interested in firms in the Twin Cities metro area and the metro receiving 89% of total investment made by all qualified investors in the program.[7] Thus, if rural markets are of concern, economic development policymakers may need to rethink incentivizing capital investment with a statewide ATC.

The second type of place effects documented include aggregate or macroeconomic impacts. As reported above, the ATC across multiple states was correlated with a boost in the leveraged capital, local employment, earnings, and value added of the state, but the research did not provide further place-relevant breakouts (Tuomi and Boxer 2015).

Finally, entrepreneurial ecosystem research is concerned with the characteristics of a specific place. In relation to capital incentives, the research suggests that angel investors assume an important role in the ecosystem because they are often the most sophisticated, active, and effective investors with deep connections in the economy. In addition, they often have access to additional VC. Policymakers who can find a way to institutionalize angels' roles and angel investing knowledge could improve the entrepreneurial ecosystem in a region (Lerner and

[7] This urban geographical advantage is also found in the SSBCI evaluation described below.

Schoar 2016). For example, policymakers can incentivize business angels to coordinate members into more formal networks, raise awareness of entrepreneurship needs, and/or facilitate relationships among business angels and VCs to increase efficiency and availability of capital to be more effectively routed to high-growth potential companies (Croce, Guerini, and Ughetto 2018; Hechavarría, Matthews, and Reynolds 2016). Although this policy advice seems relevant, there is a lack of studies that break programs down into such evaluative components of the ecosystem to test and document effectiveness.

Lessons from the ATC

The ATC serves as an example of how economic development policymakers can vary the structure of entrepreneurship incentives because the incentive benefits different ecosystem actors. The ATC is an incentive that seeks to foster a new, larger investor class and, in turn, increase the amount of angel capital available to entrepreneurs. The ATC can be loose and focus solely on the deal and investment side, or it can be designed as a more robust dual-sided program with a set of "qualified" investors and businesses. The latter approach can attach specific economic development criteria to help meet the goals for particular types of entrepreneurship, whether it is beneficiary firm age and industry or entrepreneur ownership characteristics (diversity, financial wealth, firm location, etc.).

The incentive programs and their design should be consistent with the policy intent and the reasons for an entrepreneurship strategy. A dual-sided ATC structure recognizes the importance of angel capital, notes and attempts to decrease the angel investment gap in the ecosystem, and ties the ATC to specific types of entrepreneurship development goals. This type of incentive program could examine the effect on the state's angel investment and track the outcomes for entrepreneurs and startups.

Although Minnesota has a dual-sided program, it lacks this level of data collection and metrics. The evaluation of its program may have met administrative reporting goals, but the evaluation occurred only three years after implementation – not a long enough time period to assess firm and policy outcomes for the ATC.

An additional ATC lesson relates to good governance issues. The criteria and monitoring must be tight enough to quash investor or firm abuse of the credit. This effort includes stopping ATC investors from being involved directly in a firm and limiting the crowding out of firms that may not look as profitable since they have had no previous equity investment and have no access to traditional financing. If an evaluation could show that the latter is a gap in the ecosystem, it would inform policymakers of the need for a subsequent targeted incentive around scaling pre-seed to seed to early-stage firms. Although Minnesota has such a program, no evaluation or research is available to address this set of issues and determine effectiveness.

R&D Tax Credits and Investment Tax Credits

R&D tax credits and investment tax credits are common fiscal tools, and although they do not meet the strict test of demonstrating an influence on business decisions, they can indirectly

subsidize certain actions of the firm. The studies called out below examine the effect on entrepreneurship and offer perspective on policy design.

Firm

Analyses of R&D tax credits note various negative impacts on entrepreneurship, such as lower rates of new market entry and startup creation (Balsmeier, Kurakina, and Fleming 2018; Babina and Howell 2019; Curtis and Decker 2018). Of interest in one of the studies estimating the negative effects of R&D tax credits was an insight into the nature of future entrepreneurship. Babina and Howell (2019) suggested that R&D tax credits may indirectly affect new firm formation through a channel of corporate R&D as employees leave to become entrepreneurs. R&D tax credits were correlated with an increase in employee departures to entrepreneurship, such that a 100% increase in R&D predicted an 8.4% increase in the mean departure rate. These "leavers" were more likely to go to startups that were venture capital-backed, high-tech, high-wage, and in different sectors than the parent firm (Babina and Howell 2019).

Place

Another thought-provoking analysis of state R&D tax credits not only finds positive effects of the credit, but also has insights for the importance of analysis at regional levels and of startup quality. The study uses the staggered introduction of tax incentives across different states to measure the difference in the average creation of local entrepreneurship at the county level (Fazio, Guzman, and Stern 2019). Thus, it distinguishes the effect in counties in a state with an R&D tax incentive from that in counties in a state without the incentive. The authors found that levels of entrepreneurship in counties with R&D tax credits show an increased quantity of startups after the third year, and the increase continued up to year 14, with a difference of about 20% in the level of entrepreneurship after ten years of the program (Fazio, Guzman, and Stern 2019). The study also found that the R&D tax credit was correlated with the quantity and quality[8] of entrepreneurship. The average difference in the quantity of entrepreneurship was 7.0% between counties with R&D credits compared to those without and a difference of 7.6% for the quality-adjusted quantity of entrepreneurship.

In comparison, investment tax credits were found to be ineffective. One study found a decline in the rate of firm formation and suggested the incentive was specifically burdensome to high growth potential firms. The research proposed "a 'crowding out' effect on investment in a region as the investment tax credit is taken advantage of by large companies" (Fazio, Guzman, and Stern 2019, 24). In contrast, another study found evidence that while the tax credit rate increased the density of high-growth companies, it still decreased the average growth rate of startups and share of scale-ups (Barker 2017).

[8] The authors use predictive analytics and business registration records to measure startup characteristics like whether the firm is organized in order to facilitate equity financing, seeks intellectual property protection, and has meaningful growth outcomes – achieving an IPO or high-value acquisition.

Equity Investment

Equity investment represents another segment of finance and capital programs. Although no academic studies were available, a robust evaluation of the federal State Small Business Credit Initiative (SSBCI) provides insight into how federal funds enabled states to leverage new small business financing via state-designed credit and investment programs. The evaluation reports on the types of firms that benefited from the investment and suggests gaps in this intergovernmental program.

Firm

SSBCI's Venture Capital Program (VCP) is most relevant to entrepreneurship incentives. Thirty-eight states created VCPs to provide equity finance to new small businesses. These 38 state programs allocated about 31% of SSBCI funds.[9] The evaluation reports summary data on the type of firms that received funds but does not report on firm impact. From 2011-2015, state VCPs focused funds on small, seed, or early-stage businesses in which median firms had four employees and most firms were less than five years old. In addition, VCPs funded technology-driven firms within the three sectors of professional, scientific & technical services; information; and manufacturing across industries of commercial services, software, media, devices and supplies, retail, pharma, and biotech.

The evaluation was conducted only five years after the federal legislation passed and four years after the initial round of funding in FY2011. This timing limits the ability to determine firm impact. First, many states took more than two years to create and implement their programs before being able to disburse the funds to new businesses. Second, the impact of entrepreneurship incentives also takes time to work through the business growth and economic processes.

For example, the evaluation's attempt to examine the impact of the funds on employment and job growth likely led to unreliable projections. Job projections rely on estimates from applicant firms. However, most young, early-stage firms are not able to project their future employment needs or even their chance of survival. Problems with the firms' reported estimates are compounded by the short time period between VCP funds disbursement and the evaluation's collection of the jobs data. The SSBCI evaluation reports that VCPs allocated $448 million, an amount that was 18% more than the initial federal allocation. Yet even with the larger amount of funds allocated, the number of jobs created or retained was only 39% of the jobs that were originally projected.

Regular and timely evaluations are essential. However, because of the challenges that new firms face, the unreliable job creation projections, and the longer time horizon required to measure a program's impact properly, evaluations must be phased in with realistic metrics. The evaluation's overall results reinforce the opinions of researchers and policymakers who suggest that entrepreneurship for economic development is more appropriately cast as a long-term

[9] VCPs included several strategies: state agency, co-investment, state-supported entity, and fund.

strategy for job creation (Center for Regional Economic Competitiveness, and Cromwell Schmisseur 2016).

Place

The SSBCI evaluation found that the geographical distribution of VCP funds also favored urban areas, which claimed 94% of transactions.

The lack of research on public venture funds is likely a reflection of the fact that equity investments are risky and less prevalent. Although SSBCI lessened the risk and enabled states to leverage funds for VCs, the short time period between the program's start and its evaluation likely does not allow for a full picture of its effectiveness.

The slow rate of disbursement of the funds across the states provides a lens into public equity's risky nature. For example, states may be constitutionally limited from private equity participation and/or face many hurdles in creating the legal structures necessary to execute certain fund investment strategies. Also, a state's inexperience and the complicated nature of creating VC entities and funds tend to result in the generation of overall low returns. In the end, the efforts appear to fail.

Most research advises avoiding the equity approach. If it is pursued, however, Motoyama and Wiens suggest that states consider the following recommendations:

- creating cohorts and distributing multiple small investments to the cohorts while ensuring the recipient companies are integrated into the local ecosystem
- involving local entrepreneurs in the award selection
- ensuring support organizations have managers with good networks and effective board of directors
- creating a program with reasonable expectations for the program's time frame and collects data about the companies receiving funds (Motoyama and Wiens 2015)

States are often more administratively experienced and comfortable with fiscal tax credits and may be more successful working on stimulating VC investment indirectly.

Grants

Firm

Grants represent the final segment of financial and fiscal incentive programs. There is, however, a paucity of academic research on specific grant programs. The only exceptions were examinations of federal grant programs like Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR). These programs subsidize innovation and research and development (R&D) related to commercialization that has federal appeal to the granting agencies. Academic analysis of two programs, SBIR and the now defunct federal Advanced Technology Program (ATP), indicated favorable impacts on entrepreneurship. One study examined the influence of the Department of Energy's SBIR grant program on firm

innovation, finance (VC), revenue from commercialization, and firm exit and survival. The author found that Phase I awards have positive results on a young firm's patents (median of six years, most less than one year old), VC investment (receipt, amount, and number of deals), revenue, survival, and successful exit (IPO or acquisition) (Howell 2017). As a comparison, a study of the defunct ATP program found that receipt of an ATP award from 1998-2000 had a significant and positive effect on firm survival (with no consideration of firm age) over a time period of 14-16 years through 2014 (Smith, Feldman, and Anderson 2018).

The two phases of the SBIR program awards enable firms that demonstrate progress and meet other criteria in Phase I to have an opportunity to submit a Phase II application. However, research suggests that the burden of Phase II's additional grant program reporting and other conditions make securing private funding more appealing than securing an SBIR Phase II grant. More problematic is that according to one study, Phase II generates no measurable effect, except for a small positive effect on cite-weighted patents (Howell 2017).

Other SBIR program research indicates that a firm completing Phase II had a positive and significant effect on a firm's sales of the technology that it developed through the SBIR program. However, the mean age of the businesses in this study was 11 years old, and age was not a significant factor contributing to sales (Audretsch, Link, and Scott 2002).

Another federal program with limited program evaluation is the Seed Fund Support[10] Grants from the Department of Commerce's Economic Development Administration's Office of Innovation and Entrepreneurship Regional Innovation Strategies. The program reported that from 2014 to March 2018, companies receiving support from the regional grantees resulted in 1,042 jobs across 158 companies (with no consideration of firm age) at a cost of $9,769 per job, which was funded by federal and local matching funds (U.S. Economic Development Administration Office of Innovation and Entrepreneurship Regional Innovation Strategies 2018).

Few states evaluated grant programs in any manner beyond releasing basic program numbers. Wisconsin's Entrepreneurial Micro-Grant (Wisconsin Legislative Audit Bureau 2019) serves as an example. An evaluation of all Wisconsin Economic Development Corporation's programs reports only the dollar amount that it awarded to the Micro-Grant program ($200,000 for both Fiscal Years 2016-17 and 2017-18) and explains that the program provides grants of $750 to $4,500 to help businesses desiring professional assistance in applying for federal grant funds, business planning education, and development of commercialization plans. The only outcome provided in the evaluation is that the Center for Technology Commercialization, the statewide entity that administered the program in 2017-18, assisted 117 businesses.

[10] https://www.eda.gov/oie/ris/seed/seed-program-overview-infographic.htm. The program is now called the FY20 Capital Challenge and is part of the Build to Scale program (https://www.eda.gov/oie/buildtoscale) (U.S. Economic Development Administration Office of Innovation and Entrepreneurship Regional Innovation Strategies n.d.).

Innovation and Entrepreneurial Ecosystem

A subset of financial and fiscal programs offers resources and incentives that enable and support the actors with activities in the innovation and entrepreneurial ecosystem. These economic development programs focus on innovation to stimulate a pipeline of firm startups and job creation with the promise of subsequent economic growth. Programs that attempt to enhance the innovation and entrepreneurial ecosystem seek to fill the gaps where entrepreneurs face the most innovation challenges – innovative ideas reaching the market, physical spaces, and enhanced ecosystem opportunities with access and regional technological infrastructure.

Commercialization

The commercialization of basic and applied research emerging from universities and private institutes, as well as from new entrepreneurs and existing companies, has long received federal and state support. However, academic research has focused primarily on the effectiveness of federal grants (reviewed in the finance and capital section pertaining to such programs as SBIR, STTR, and ATP) and not on technology transfer programs and innovation grants. In states that have reviewed such programs, the evaluations addressed large categories of related programs and reported only summary statistics on the number of grants and dollars disbursed for a specific program, such as Wisconsin's Small Business Technology Transfer Matching Grant (Wisconsin Legislative Audit Bureau 2019).

One review of technology transfer offices (TTOs) in universities offers a micro-geography examination of how TTOs can help achieve both economic development and investor results. The study of life science university-licensed startups found that initial public offerings (IPOs) were the only liquidity events that drove positive economic impact, with increased employment (68% of the sample of university-licensed startups) and wages that paid more than two and a half times the annual wage. Although IPOs had no impact on investor returns, acquisitions did have a positive impact on investor returns. These findings suggest that TTO metrics could be better aligned to measure external and internal impact. For economic impact and returns, TTOs should focus on commercialization metrics and company exits through IPOs. Internally, acquisitions are important to measure given TTOs' financial investment and because both licensing revenue and the appreciation of the university's equity stake are greater with acquisitions (Godfrey, Allen, and Benson 2020).

Bottom Line

In general, few fiscal and financial incentives are found to be consistently relevant to entrepreneurship activity across the documented academic and state program analyses. Some research suggests that angel tax credits (ATC) have a positive, but limited, firm and community impact. A few of the other incentives reviewed in this category have geographical and entrepreneurship ecosystem effects and provide insight into the dynamics of investors and programming.

Services

Although economic development tools include services, there is an insufficient specificity about which services are most essential to fostering entrepreneurship and job creation. The documented research also includes incubators, accelerators, and maker spaces but often view these as a single tool providing entrepreneurship with physical spaces and programmed services.

The level and diversity of services that entrepreneurs and startups may require will differ based on the type of innovation, its phase of ideation and development, and firm characteristics. These are likely more tailored and specific than the types of general services that a small business program might deliver. The support services of incubators, accelerators, and maker spaces are diverse, as are those of the growing number of coworking spaces that can offer varying suites of entrepreneurship services. The lack of analysis on specific services and firm outcomes limits the design knowledge and potential of service entities.

Innovation Spaces

Researchers seem to be more inquisitive about entrepreneurship and startup spaces and their contributions to the innovation success of entrepreneurs and startups. These spaces include incubators, accelerators, and maker spaces. Research, while not consistently supportive, indicates that incubators and accelerators can play an important role in entrepreneurship when the programs are structured to meet needs. Physical space is just part of the equation since most spaces provide an array of services. Unfortunately, the research does not break out the suite of services that an innovation space may offer and thus does not evaluate the impact of different types of services on a firm. Instead, evaluations group the services together with the space to provide an overall indication of how the “package” of innovation startup spaces can lead to better firm results.

Incubators

Firm

Research indicates that incubators’ effects on firms are not robust. For firms that were less than five years old at the time of incubation, studies indicate that incubated firms outperform their non-incubated peers in employment and sales growth, but the improvement is only marginal. More problematic is that incubated new ventures do not survive longer than non-incubated firms (Amezcua 2010a; 2010b).

Place

Some of the incubator research pushes to understand the interplay between entrepreneurship needs and the regional environment to ensure an incubator has the most appropriate and helpful type of organizational sponsorship. This research asks how an incubator can best make up for a region’s disadvantages or enhance its advantages to increase a firm’s likelihood of survival. For example, firms in regions with positive agglomeration externalities (e.g., input sharing, efficient and effective matching of firms with resource providers, and knowledge

spillovers) would have very different startup needs than those in regions with negative externalities (e.g., rising costs and congestion).

Breaking agglomerations down further, the research examines how a region's levels of urbanization and localization economies may require different incubator programming to best assist new firms in these conditions. Urbanization economies represent the city-scale of the region in which the firm is founded, while localization economies represent the presence of same-industry firms in the region. The study found that survival of incubated firms is better in regions that have either low urbanization and low localization or the exact opposite – high urbanization and high localization (Amezcua et al. 2019). For the first scenario, incubators would be most effective when mitigating the *lows* of resource-deprived environments in which firms need non-monetary resources such as accountants, lawyers, or industry-specific suppliers and investors. For the second scenario, incubators would also be helpful in protecting new firms from the *highs* of a hyper-competitive landscape in which young firms are more likely in need of financial aid and subsidies to be able to compete.

The relationship between incubated firm survival and the regional environment has a parallel in an environment that is a smaller "spatially-bounded micro-geography." These places are commonly university-centric areas offering hyperlocal entrepreneurial support. For example, the University of North Carolina reinforced its core educational and research missions around entrepreneurship and incentivized a significant number of proximate university business incubators. The efforts were found to correspond to an increase in entrepreneurial intensity, a geographic tightening of firms in and around the campus, and earlier launches of entrepreneurial firms – even though they had technologies that were less tested. The interplay between geography, institutional actors, and organizational support suggests that concerted efforts in smaller geographies can have positive impacts (Donegan and Lowe 2020). The micro-geography idea may also carry over to the design of policy and programming in innovation districts and research parks. There are no studies on this topic, however, possibly because these areas are often thought of as pure real estate plays in economic development.

Accelerators

Firm and place

Research on accelerators finds that enhancing the role of VC and funding opportunities has a positive effect. Accelerators can build the entrepreneurship ecosystem when they lead to faster VC funding developments and draw attention to a region (Hochberg 2016; Fehder and Hochberg 2014). A study (Fehder and Hochberg 2014) that used matched pairs of firms, with one in an accelerator and one not in an accelerator, found the following effects on the metropolitan statistical areas (MSAs) ecosystem:

- 104% annual increase in the number of seed and early-stage VC deals in the MSAs' ecosystems
- 289% increase in the log total dollar amount of seed and early-stage funding provided in the region

- 97% increase in the number of distinct investors investing in the region (Fehder and Hochberg 2014)

The finding of an increase in the number of distinct investors relates to geographic ecosystem concentration since the increase primarily came from local investment groups that were located within 200 miles of the center of the MSA rather than from investors outside the region. The authors are careful to state that the findings are not a policy prescription because the arrival of an accelerator in an ecosystem may not have these effects if other ecosystem components are not present. The study also did not assess the effectiveness of investing in an accelerator compared to other entrepreneurship programs.

Other research suggests that the structure of the accelerator program matters. Those that are reported to have more impact (based on qualitative evidence) provide guidance on problem solving, mentor meetings, and educational seminars, as well as increasing peer interaction and transparency, improving contacts and networks, and assisting with business/operational processes (Cohen and Hochberg 2014; Hallen, Cohen, and Bingham 2019; Cohen, Bingham, and Hallen 2019).

Maker Spaces

The final innovation space that academic research is recognizing as an economic development tool for entrepreneurship is maker spaces. Unlike incubators and accelerators, however, there is no central database on maker spaces to track these spaces, which limits evaluation. Instead, studies focus on a qualitative discussion of a maker space's provision of business services such as assistance with distribution and marketing (Browder, Aldrich, and Bradley 2019; Wolf-Powers et al. 2017). One study suggested that the type of maker space should align with economic development goals. That is, if job creation is the foremost goal, a place-based manufacturing maker space would be a better tool to generate firms that are more likely to hire greater numbers of employees, even in the new "higher productivity with lower number of employees" manufacturing world (Wolf-Powers et al. 2017).

The government often funds more than physical spaces to foster and support the entrepreneurial ecosystem such as pitch competitions or regional technological infrastructure in relation to entrepreneurship. However, there is an absence of any analysis of these efforts.

Entrepreneurship Training

Firm and Entrepreneur

Entrepreneurship training is another service for which very few studies do exist. An exception is the Small Business Administration's (SBA) Growing America Through Entrepreneurship (GATE) program (Fairlie, Karlan, and Zinman 2012). The program offered specialized, subsidized training on being an entrepreneur and had a curriculum focused on individual professional development and business coaching.

GATE was, in part, intended to be a tool to assist with unemployment. As the entrepreneurship literature has noted before, there is a difference between necessity/push entrepreneurship and opportunity/pull entrepreneurship (Fairlie and Fossen 2019). The GATE course was more likely to attract those becoming entrepreneurs as the result of job losses – necessity entrepreneurs – because of the intent of the legislation and program. As research suggests that entrepreneurs who are pulled from their occupations – opportunity entrepreneurs – are more likely to be successful, the GATE program may not best represent the potential of entrepreneurship services.

The evaluation of the GATE program supports this assumption since the program did not have a positive effect on entrepreneurship in the long run. Although its training increased short-run business ownership and employment for unemployed individuals, positive effects were not found for other time horizons or outcomes. The program did not influence business survival and performance (profits, business size, and success) or household income and work satisfaction. These findings did not vary by economic conditions. The evaluation's results, then, raise questions about the effectiveness of subsidized entrepreneurship training for the program's other goals of addressing credit, human capital, discrimination, or social insurance constraints (Fairlie, Karlan, Zinman 2012, 44).

A related evaluation examines self-employment training for dislocated workers interested in starting their own businesses. The U.S. Department of Labor's (DOL) Self-Employment Training (SET) pilot program was for individuals who were unemployed and underemployed who also proposed businesses in their fields of expertise. The program provided free access to 12 months of case management, customized training and technical assistance, and up to $1,000 in seed capital microgrant funds for business start-up costs. The program operated in four sites – Chicago, Illinois; Cleveland, Ohio; Los Angeles, California; and Portland, Oregon – between 2013 and 2017 (Hock, Anderson, and Santillano 2018). Unlike GATE, the program was not billed as entrepreneurship training. SET's participants were similar to those in GATE, however, in that they were necessity entrepreneurs. Thus, the comparison to GATE allows for some insights.

The evaluation utilized survey data collected 18 months after the study enrollees applied to the program. A random assignment design included 1,981 eligible applicants divided almost equally between a SET program group and a control group. The survey led to the findings below:

- SET more than doubled the share of people who received nonborrowed, seed capital funds during that time – from 21 to nearly 49%
- SET resulted in a persistent increase in self-employment, with 68% self-employed versus 56% of the control group
- SET increase dual employment – holding a wage/salary job while pursuing self-employment – from 28% to 35%
- SET had no discernible impact on earnings for the program group versus the control group over the period between 7 and 18 months after study enrollment (Hock, Anderson, and Santillano 2018)

SET saw greater program group costs as a result of these changes, but these costs were expected. Those in SET received more personalized assistance, with three times the average number of personalized contacts with self-employment assistance providers and an increase from 33% to 36% in the share of people who attended in-person classes or training (Hock, Anderson, and Santillano 2018, xi).

The evaluation also provided outcomes by characteristics of the SET participant:

- self-employment rates increased by a substantial amount for each demographic subgroup
- there was no measurable difference between the estimated impacts on older and younger enrollees, on men and women, or on non-Hispanic white enrollees and members of other racial/ethnic groups (Hock, Anderson, and Santillano 2018, xvii)

Place

The SET evaluation found some differences in outcomes among the various program locations. Two sites, Cleveland and Portland, had consistent evidence of improving business development and work outcomes. The Chicago and Los Angeles sites, however, did not have the same results. The evaluation was unable to establish whether this finding was related to site differences, such as implementation and local economic conditions. It was also unable to determine if it was due to the types of study enrollees or the number of enrollees, given the relatively small number of study enrollees in each site (Hock, Anderson, and Santillano 2018, xvii).

The short-term findings for SET are similar to those for GATE. Thus, more time and further analysis is needed to understand if the employment and earnings outcomes of SET participants and control groups converge or if the program's effects take more time to emerge as with GATE.

Bottom Line

Although economic development tools include services, there is a lack of specificity about the exact services that are most essential to fostering entrepreneurship and job creation. Service-specific analysis could assist in determining the level and diversity of services that entrepreneurs and startups find helpful and could be varied by a firm's type of innovation, the phase of ideation and development, and other firm characteristics. Entrepreneurship training seems promising in certain locations and settings, but these federally funded programs provide little global evidence that states should begin to offer or support these services.

What's Needed to Know What Works?

Policy and Program

There is often tension between policy goals and program objectives, with program goals often focused on entrepreneur and firm-level outcomes and policy goals focused more broadly on

outcomes for the regional economy – such as job growth. The review of incentives for entrepreneurship in this report considers the program's effect on the firm and entrepreneur – the "inside the firm" or micro entrepreneurship perspective. The effect of incentives on location/place are also highlighted, which are more closely aligned with "outside the firm" or macro entrepreneurship effects. Most programs are tied to overall policy goals of improvements to the regional economy, like job growth. To be able to evaluate these goals, the data should be collected for both levels of outcomes. Most of the research reviewed suggests, however, that data is almost always lacking on the outcomes and trajectories of the firm, entrepreneur, and location. Economic developers need to design program metrics that will allow them to measure progress toward their goals, whether it be playing a specific role, filling a gap in the ecosystem, or addressing more targeted issues.

Another relevant policy-level problem is that economic developers at the state, local, and even university levels cannot control the movement of entrepreneurs who may need to relocate their operations. These moves are probable if a location lacks access to the critical resources necessary to round out venture success, such as a pool of entrepreneurs and experienced management, state-of-the art lab space, access to knowledgeable risk capital, or easy access to service companies and industry partners (Godfrey, Allen, and Benson 2020). The inability to directly affect a firm location decision suggests that it is essential for an incentive program to learn more. Measuring startup formation with more detailed firm and entrepreneur characteristics would help increase understanding of entrepreneurial firm needs. In addition, incentives need to strive for a long-term impact on economic development, regardless of relocating entrepreneurial firms. Success must be measured, therefore, with economic impact data, such as growth in employment, total wages, VC raised, and any liquidity events (IPOs and acquisitions) (Godfrey, Allen, and Benson 2020). A balance of the policy and program micro and macro entrepreneurship goals and objectives need to guide data collection and reporting.

Several of the documented studies offer recommendations for incentive programs or offer policy critiques. The steps listed below address incentive effectiveness and are relevant to the general structuring of economic development incentives to enhance entrepreneurship:

- Incentives should be transparent and uncomplicated, reducing the administrative burden on start-ups and investors.
- Incentives should be generous enough to stimulate investment but not eliminate all investment risk to ensure that viable projects are financed.
- To prevent abuse, incentives should have prudent eligibility criteria for investors (for accredited arms-length investors) and investments (for equity and near equity held for a sufficient period of time). These criteria could also involve restrictions on fund use for the payment of dividends, loans, and/or redemption of shares (Tuomi and Boxer 2015, 269).

Data

In terms of data collection to evaluate incentives, the goals and objectives provide the contours of the definition of entrepreneurship, the metrics that are collected, and the length of time that should pass before evaluating outcomes. Given that the government plays a minor role in

entrepreneurship, better measurement and data collection would enable targeted evaluation even when entrepreneurship programs and the amount of funding are small. It would be better to know if economic development entrepreneurship incentives can move the needle than to continue to spend limited funds without collecting the necessary data to evaluate.

The review of the research for this appendix and report suggests that:

- Data collection must be standardized across programs and linked to compilations of administrative panel data on the universe of business start-ups (Fairlie, Miranda, and Zolas 2019).
- Appropriate metrics need to be consistently defined based on firm micro and state/regional macro entrepreneurship goals and measured longitudinally.
- Evaluations need to occur after more time has passed since implementation so that the intervention can have measured effects.

Policymakers, constituent member organizations, and foundations could support the development of guidelines, encourage standardization, and assist with the collection of such valuable data. Leadership and support of these efforts can help states fill gaps in the ecosystem and improve the effectiveness of state economic development entrepreneurship incentives.

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