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Policy for innovative entrepreneurship: Institutions, interventions, and societal challenges

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Abstract

Research Summary: Innovative entrepreneurship, defined as the creation of new products, services, production methods, or business models, is critical for firm, industry, and economic growth and a key determinant of societal well-being. This special issue explores the roles of institutions and government policies in promoting or impeding innovative entrepreneurship. In this introductory editorial, we review theory and evidence on entrepreneurship at the macro-institutional and micro-policy levels, highlighting costs and benefits of alternative institutional environments and targeted policy interventions, as well as interactions within and across levels. We summarize the six papers in the special issue, discuss their contributions to the literature, and suggest how future work can build upon these and other papers to advance our understanding of the conditions and mechanisms underlying successful entrepreneurial innovation.

Managerial Summary: Innovation and entrepreneurship bring new products and services to market, help firms and industries to grow, and generate improvements in social and

economic life. The papers in this special issue explore the background conditions—laws, political processes, regulations, tax policy, subsidies, training programs, and more—that make entrepreneurship and innovation successful. Both "macro" and "micro" policies can stimulate successful entrepreneurial and innovative outcomes, but can also become politicized, be ineffective, and generate unintended consequences. The papers offer lessons to researchers, policymakers, and practitioners about making entrepreneurship and innovation more successful.

KEYWORDS
entrepreneurship, innovation, institutional environment, public policy, research methods

1 | INTRODUCTION

With every passing era, the world benefits from new discoveries and practices that advance humankind. Many of these contributions can be attributed to entrepreneurs working diligently to launch new innovations into the world and overcome the obstacles that often stymie such pursuits. While there are many forms of entrepreneurship, we focus in this Special Issue on innovative entrepreneurship, defined as the creation of new products, services, production methods, or business models likely to spur firm growth, generate value-added jobs, and create individual, corporate, and societal wealth (Agarwal, Audretsch, & Sarkar, 2007; Carree & Thurik, 2003; McKelvie, Brattström, & Wennberg, 2017). Innovative entrepreneurship can also unleash solutions to unexpected social crises (such as the Covid-19 disruption of 2020–2021) and breakthroughs for unresolved economic and societal issues related to poverty reduction, climate change, access to healthcare, and other "grand challenges" (Bryan, Lemus, & Marshall, 2020; Leach et al., 2012). As a result, innovative entrepreneurship can be an engine of long-term economic growth and improvements in societal welfare.

While successful innovations are often glamorized, many more attempts to launch innovative projects and ventures fail after consuming significant financial resources. Moreover, there is increasing concern among technologists and economists that the rate of innovation is stagnating (Collison & Nielsen, 2018; Cowen, 2011). This is all the more reason to pursue policies and institutions that generate more and better innovative outcomes from given resources. In light of the complexities, uncertainties, and difficulties associated with innovation, what policies, institutions, and social conditions encourage innovative entrepreneurship and channel it toward activities that improve societal well-being?

Most academics, policymakers, journalists, and the general public expect that well-designed government policies can promote entrepreneurship and innovation in products, services, and business models. However, the overall effects of such policies, the exact mechanisms by which they operate, and the boundary conditions under which they apply remain unclear. Advocates often skirt these critical questions, but each deserves careful investigation. For example, do direct incentives such as cash subsidies and grants, state-funded incubators and accelerators, and public research parks work best, or are there more gains from indirect subsidies delivered through infrastructure support or technical training (Dimos & Pugh, 2016; Lerner, 2009)? Alternatively, is it best to focus on legal and regulatory policies such as expedited patenting, flexible labor laws, reasonable business registration and licensing procedures, or bankruptcy codes that allow resources to be reallocated? Should government provide tax credits to unproven nascent ventures, small or high-growth firms, or to corporate R&D initiatives (Cappelen, Raknerud, & Rybalka, 2012)?

Given incentives of policymakers to "do something" to support opportunities for economic growth, policy scenarios that "do less" are often neglected. Careful consideration of all feasible alternatives is important given that policies often have unintended consequences. For example, while targeted subsidies can increase growth and success of the treated firms (Autio & Rannikko, 2016; Mason & Brown, 2013), such interventions may also encourage rent-seeking, political favoritism, or other inefficiencies, what Baumol (1990) famously called unproductive and destructive entrepreneurship. These downsides may be overlooked, especially when policies appear to be producing favorable outcomes. Given these hazards, there may be tradeoffs between targeted microlevel policies that boost particular firms, industries, or technologies thought to have high potential commercial or social impact and broader, macrolevel policies that try to create a supportive institutional environment in which innovative entrepreneurship can flourish, without preconceived notions about who the winners will be (Autio & Rannikko, 2016).

In a perfect world, carefully crafted policies can make innovative entrepreneurship flourish and help qualified recipients as intended. More realistically, every policy design embodies tradeoffs. These counterfactual scenarios are difficult to avoid and should be anticipated when designing policies for particular outcomes and assessing their effectiveness.

2 | AIMS OF THE SPECIAL ISSUE

This special issue of the *Strategic Entrepreneurship Journal* focuses on how such tradeoffs embedded in policies designed to encourage innovative entrepreneurship affect outcomes and intended recipients across geographic, industrial, and institutional settings. We spotlight these tradeoffs as a way to rejuvenate research interest in the conditions facing entrepreneurial individuals and firms undertaking innovative entrepreneurial efforts. We have collected an exemplary set of articles that showcase novel empirical strategies, derive new theoretical concepts, and exploit new data sources. Because entrepreneurship is a broad and interdisciplinary phenomenon, the special issue spans corporate strategy, innovation economics, institutional organization theory, and entrepreneurship research.

Designing and evaluating public policies to promote innovative entrepreneurship poses unique challenges, arising from the nature of entrepreneurship and innovation. Entrepreneurs are establishing new ventures, inventing new products and services, experimenting with new business models, and creating new markets. They are operating under high levels of uncertainty, in environments characterized by causal ambiguity, novelty, and complexity (Klepper, 2015; Ott & Eisenhardt, 2020; Sarasvathy, 2001; Du & Kim, 2021). Because of these challenges, government policies that attempt to target particular outcomes—to "pick winners," in the language of industrial policy—are likely to fail in such environments. Indeed, the track records of many policies designed to favor certain businesses, to target the most promising technologies, and otherwise "steer" the diffusion of innovation are remarkably poor (Lerner, 2009). Even recent attempts to identify specific government programs as the key drivers of today's most important technologies (Mazzucato, 2015) are problematic, as they typically consist of "just-so stories" without attention to counterfactual explanations or similarly designed but failed programs (Karlson, Sandström, & Wennberg, 2020). Instead of increasing the prospects of high-growth outcomes among those who could not otherwise achieve them, targeted programs risk promoting "crony capitalism" under which politically favored firms, industries, and technologies prosper at the expense of those lacking such connections, such that resource allocation is being directed by politics, rather than market forces (Klein et al., 2021).

A related issue for measuring outcomes is that participants in targeted entrepreneurship programs, such as individuals working in incubators or firms receiving research grants, may have already been successful even without participating in these programs. Receiving support would only amplify their existing positive trajectory. To isolate the treatment outcome of a policy or intervention, we need to control carefully for selection, which is often difficult, especially when policy interventions are not designed as experiments. Goolsbee (1998), for example, found that the main effect of U.S. government subsidies for scientific research was to increase the salaries of scientific and technological personnel, not to produce research that otherwise would not have occurred. This dynamic may explain the mixed success of incubator and accelerator programs (Hausberg & Korreck, 2020). Even if we can isolate a treatment effect of a policy or intervention, it is often unclear if the effect comes from improvements to the quality or quantity

of the entrepreneurial projects themselves, or the signaling value to other market participants (investors, customers, partners) of affiliation with a prestigious program.

Given these challenges in designing and evaluating public policies for innovative entrepreneurship, some observers recommend that the most appropriate role for government policy is to establish and enforce a stable institutional environment—the "rules of the game" that undergird a well-functioning legal system, establish open markets with low barriers to entry, curtail political favoritism, and other protective measures (Acemoglu, Akcigit, Alp, Bloom, & Kerr, 2018; Baumol, 2002; Djankov, LaPorta, Lopez-de-Silanes, & Shleifer, 2002). Within these institutional guidelines, can targeted firm-, industry-, or technology-level interventions still stimulate entrepreneurship and innovation without leading to inefficiencies and cronyism?

3 | RESEARCH FRAMEWORK

To explore these questions, we offer a framework that highlights the tradeoffs, complementarities, and boundary conditions associated with innovative entrepreneurship policies. We argue that this framework can help researchers recognize the potential shortcomings embedded in these policy designs and anticipate how to integrate them into their policy evaluations. As we discuss in Section 3.2, policy evaluation of specific interventions requires a careful assessment of both selection (e.g., how participants qualify for support programs) and treatment (e.g., how participants receive and learn from support programs). This distinction reveals whether policies facilitate new organic innovations and growth potential that otherwise would not have taken place (the policy's intended outcome) or mainly certify people and projects that already demonstrated value, showed high potential and would have succeeded without extra support (the counterfactual). There may also be interactions among legal, tax, regulatory, financial, cultural, and other facets of the institutional environment that jointly impact public policy programs seeking to enhance innovative entrepreneurship. Several papers in the special issue also explore how policy affects different types of ventures including private firms, public–private partnerships, hybrid models, or novel forms of organizations that involve multiple stakeholders. The mechanisms for how these tradeoffs operate vary across interventions and their intended audiences.

Policy considerations and academic studies on innovative entrepreneurship often emphasize either a "macro" approach focusing on broader institutional effects or a "micro" approach focusing on specific policy interventions or target recipients (Baumol, 2002). The former focuses on the institutional environment, understood as general, background rules or constraints shaping the conditions for new firm entry, investments, and innovation (North, 1990). This literature broadly holds that more efficient institutions are those that encourage capital formation, allow for broad latitude in experimentation and creativity, and ensure that new and small firms have opportunities to compete in the market (Acemoglu et al., 2018; Baumol, 2002; McMullen, Bagby, & Palich, 2008).

The micro approach focuses on how policy interventions such as direct and indirect subsidies or training and advising programs achieve their intended outcomes for the selected target recipients. With greater data availability and variety of policy designs globally, the micro approach offers easier pathways to evaluate policy effectiveness. Policies such as public investments in business development, infrastructure or specific sectors are typically promoted to increase efficiency and necessitated by market failure (Martin & Scott, 2000) which assumes that market-based solutions are not completely effective or that the social benefits outweigh the costs (Bradley & Klein, 2016). Still, the underlying theoretical mechanisms as well as more precise estimates of the effects and their magnitudes of various policies often remain elusive (Kim, Wennberg, & Croidieu, 2016).

Because our framework brings together both macro- and micro-elements of policy design and implementation, we recognize possible interactions between the two approaches (macro–micro) and within each domain (macro–macro and micro–micro). Certainly, evaluations that attempt to address these interactions are more difficult to execute. Given this complexity, evaluation requires suitable data, which likely explains why there are few studies on these interactions. We thus anticipate that research on complementarities and spillovers within and between the macro–micro divide can produce new insights.

TABLE 1 Effects of institutions and policies on entrepreneurship

Policy	Description/examples	Objectives	Unintended consequences	Special issue papers
Macro policies	Institutional environment—Rules of the game	Create environment in which entrepreneurship and innovation can flourish	Helps large as well as small ventures Does not target key industries or technologies Often slow and difficult to change	
Property rights protection	Low risk of nationalization/appropriation Low rate of property crime Intellectual property protection	Encourage investment and new venture formation Encourage discovery and creation of new products and services	Strong IPR can encourage overinvestment in legal protection, excess litigation costs	Teodorescu and Kuhn (2021)
Well-functioning legal system	Contracts enforced Legal disputes resolved smoothly	Facilitate economic exchange Enhance societal trust		
Free and open markets	Minimal interferences with market prices Minimal state-granted monopoly, entry barriers Minimal licensing restrictions Antitrust legislation	Encourage entry of new firms Curtail incumbents' ability to hamper competition	May fail to address negative spillovers related to specific industries (e.g., tobacco, alcohol, medicine)	
Regulations	Processes for licensing and certification of new products, services, and technologies Mechanisms to establish standards and adjudicate issues	Promote consumer and environmental safety while (1) easing pathways to receive approvals (2) removing or reducing barriers to compliance	Allow new and unintended applications of the technology Favors well-funded and connected firms Certification signals not completely accurate about underlying quality	Wang et al. (2021)
Tax code	Predictable and transparent taxation Entrepreneurial risk not overly taxed Investments in startups not overly taxed Startup-friendly stock option legislation	Encourage startups at larger minimal efficient scale Encourage working for startups Encourage investments in startups	May encourage opportunistic tax planning	Murtinu (2021)
Labor legislation	Prohibit noncompete covenants Make retirement and health care costs independent from employer Easy-to-hire, easy-to-fire legislation	Lower "switching costs" from employment to entrepreneurship Facilitate staffing in startups	May jeopardize workers' rights	Murtinu (2021)
Stable monetary system	Low inflation Predictable central-bank behavior	Encourage domestic and foreign investment Reward long-term orientation Facilitate economic calculation	Limited discretionary monetary policy to deal with crises	

(Continues)

TABLE 1 (Continued)

Policy	Description/examples	Objectives	Unintended consequences	Special issue papers
Efficient bankruptcy code	Exemption rights (limited personal liability for business debt) Reconstruction process of failed enterprises	Allows resources to be allocated from lower- to higher-valued uses	Costly to workers and other stakeholders of bankrupt ventures	
Low business registration costs	Few required permits to launch venture Fast processing of new business registrations	Encourages new venture formation	May encourage risky or low-quality ventures	
Micro policies	Intended to boost new forms of innovative entrepreneurship and support recipients who are unable to access resources through conventional markets	Allow targeting of key firms, technologies, and industries	Inefficient at picking winners Can encourage rent seeking/crony capitalism Difficult to evaluate/scale	
Financial incentives	Cash subsidies Tax incentives Government-administrated risk capital (e.g., government venture capital) Competitive grants Loan schemes	Enable entrepreneurship and innovation that otherwise would not have occurred or been as innovative	May select or certify entrepreneurs who would have been successful anyway May distort competition by sponsoring low-productive firms	Stevenson et al. (2021) Murtinu (2021)
Indirect subsidies	Incubator and accelerator sponsorship Science parks	Facilitate venture innovation and growth Facilitates clustering of complementary ventures	May select entrepreneurs who would have been successful anyway May distort competition by sponsoring low-productive firms	Stevenson et al. (2021)
Training programs	Entrepreneurship mentoring Entrepreneurship education and training Advising and networking	Enhances human capital	Costly at large scale May encourage low-quality ventures	Astebro and Hoos (2021)
Contingencies and complementarities among conditions	What micro policies work better under specific institutional conditions? How do micro policies affect institutions? How do policies interact within levels?	Make policies more effective by leveraging interactions	Costly to design and evaluate specific policies for every context	Lamine, Anderson, Jack, and Fayolle (2021) Murtinu (2021)

Note: "Objectives" and "unintended consequences" represent central arguments in the institutional economics and entrepreneurship policy literatures and are not exhaustive lists. The unintended consequences suggested here apply to any of the objectives listed in the adjacent cell of the table. For more details, see Baumol (2002), Lerner (2009), North (1990), Williamson (2000), and Acs, Åstebro, Audretsch, and Robinson (2016).

Table 1 summarizes this approach, describing the nature, intended benefits, and potential hazards associated with different aspects of the institutional environment, targeted policies, and combinations of these. The right-most column maps the papers in the special issue—described in more detail in Section 4—into this space. Before turning to the special issue papers, we offer further detail on each level of analysis.

3.1 | Macro policy for innovative entrepreneurship: Getting the institutions right

The macro approach centers on identifying the institutional conditions leading to more innovative entrepreneurship with larger positive effects. Here, the emphasis is not on designing policies that promote particular firms, industries, or technologies—or even promoting "innovation" per se. Rather, the macro approach seeks to establish and maintain an institutional environment within which innovative entrepreneurship can flourish.

North (1990, p. 97) succinctly defined the institutional environment as the "humanly devised constraints that structure political, economic and social interaction." These include "both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)." While both the informal and the formal parts of the institutional environment have important effects on entrepreneurship and innovation (Hwang & Powell, 2005), policy is particularly concerned with the latter, more formal aspects. For example, an economy featuring secure property rights, a well-functioning legal system, free and open markets, and stable monetary arrangements promotes savings, capital formation, and long-term investment, including R&D. At a more focused level, laws and regulations that make it easy to start a business, protect innovations, allow for movements of skilled labor, encourage venture capital and angel investment in high-potential, early stage ventures, allow inefficiently used resources to be reallocated through bankruptcy, and the like are particularly conducive to innovative entrepreneurship (e.g., Acs et al., 2016; Campbell, Ganco, Franco, & Agarwal, 2012; Fu, Wennberg, & Falkenhall, 2020; Lerner, 2009). Their absence constitutes what Palepu and Khanna (1998) called an "institutional void" that hampers capital accumulation, business formation, and ultimately economic development.

Of course, there is substantial work on the informal parts of the institutional environment such as norms and culture. McCloskey (2006, 2010, 2016) argued that changes in values and beliefs, rather than formal institutions, were the ultimate drivers of the commercial and industrial revolutions and, therefore, modern capitalism. Several cross-national studies using more recent data suggest that a culture that supports creativity, initiative, and experimentation, without judging failure, encourages more people to engage in entrepreneurial activity, while norms favoring competition and performance encourage high-value, high-growth entrepreneurship and innovation (Autio, Pathak, & Wennberg, 2013; Hayton, George, & Zahra, 2002; Meek, Pacheco, & York, 2010). However, because norms and culture are not very malleable, at least in the short run, policymakers tend to take them as given and focus on the more formal parts of the institutional environment when looking for ways to encourage innovative entrepreneurship.

Note that both the formal and informal parts of the institutional environment are relevant to all firms, industries, technologies, and regions, not just entrepreneurial ones. So, while the right kind of institutional environment encourages innovative entrepreneurship, it encourages other kinds of business activities too: large firms as well as small ones, mature industries as well as nascent ones, routine and incremental innovations as well as radical and breakthrough technologies.

As North (1990) and Williamson (2000) emphasized, the institutional environment changes slowly—norms and culture in particular, but even constitutional and legal features. This can be frustrating to policymakers in search of a legislative or regulatory "quick fix," or any actionable, short-term, policy move, that has an immediate effect on innovative outcomes. Hence, while we know a lot about how macrolevel institutions facilitate entrepreneurship and innovation, this knowledge does not always translate into specific government policies.

3.2 | Micro policy for innovative entrepreneurship: Targeted interventions to boost outcomes

Microlevel policies or interventions to encourage innovative entrepreneurship or particular results come from offering tangible or intangible support for startups such as financial subsidies, incubator or accelerator sponsorship, training programs, or other interventions. Public investment relies on public resources, which are always limited and require some method of allocating among the most promising recipients. There is evidence for positive, but mixed

gains from programs like SBIR in the United States (Howell, 2017; Lerner & Kegler, 2000). As mentioned earlier, picking winners is notoriously difficult for public actors lacking industry-specific knowledge, market incentives (where investments failures means private losses), and experience as private investors (Karlson et al., 2020; Storey, 2003). Moreover, public stakeholders will expect accountability of investing public resources into risky ventures that may yield inventions, but not commercialized, economically useful ones (Färnstrand Damsgaard, Hjertstrand, Norbäck, Persson, & Vasconcelos, 2017). A potential solution that reduces risk and increases positive outcomes emphasizes *retaining winners* rather than *picking winners* (Mason & Brown, 2013). For example, Autio and Rannikko's (2016) study of a Finnish high-growth entrepreneurship retention program found that growth rates of treated firms doubled over 8 years. This approach moves program selection from firm founding to those firms with established evidence of market performance. It also emphasizes a preference for using accelerators instead of incubators in promoting firm success.

To investigate this question of firm-level intervention effectiveness, it is useful to think in terms of organizational sponsorship and how this support can produce favorable outcomes. Sponsorship, following pre-modern notions of patronage, provides firms or individuals with resources that protect them from unanticipated environmental shocks and lets them focus on developing ideas rather than raising funds for each project. Sponsors increase access to resources and perceived opportunities by "bridging" program participants to new networks (Abercrombie & Hill, 1976; Amezcua, Grimes, Bradley, & Wiklund, 2013). Sponsorship arrangements may include private entities, but more frequently takes the form of public resources allocated as investment. A substantial part of research on public investments, or subsidies, of (new) innovative firms argues that public investments benefit such firms due to resource complementarities or activities that build capacity (Autio & Rannikko, 2016). For example, entrepreneurs benefit from participating in science parks through skill acquisition and access to funders (Armanios et al., 2017).

What types of firms, and how, should public entities offer support if they seek to generate societal benefits from sponsoring innovative firms? This is a two-sided question that involves both selection of the high-potential firms and then treatment of these firms to maximize their growth potential (Buffart, Croidieu, Kim, & Bowman, 2020). From a policy perspective, public agencies theoretically prefer to support high potential, but resource-constrained firms that *could do better* if provided additional support (i.e., a treatment effect). Similarly, public agencies try to avoid support for firms unlikely to survive even with sponsorship resources as well as high-potential firms that could attract private resources on their own. These scenarios, if properly executed, could maximize the reach of limited resources. However, these policy goals require careful selection procedures that avoid Type I error (investing in firms that will not take full advantage of this support) and Type II error (overlooking high-potential firms due to imprecise selection mechanisms). Otherwise, favoring just the "winners" or avoiding the "losers" may not fulfill the original policy mandate to spur new innovations and entrepreneurial efforts, but simply reinforce what already is in place.

Once correctly selected, the treatment received by program participants should increase the likelihood for maximizing the intended support and achieving a high-impact policy outcome. The treatment impact depends on a variety of factors. In terms of the level of support provided, it should be sizeable enough to make a difference, but not so large that it distorts the targeted firms' behavior or the competitive conditions in the market (Jourdan & Kivleniece, 2017). The type of support also matters, whether it comes through training, funding, or advising, as exemplified in the article of Astebro and Hoos (2021). Policy treatments may also impact recipient ventures in differential ways, as exemplified by Stevenson, Kier, and Taylor's (2021) findings that public grants may enhance the likelihood of receiving subsequent (private) investments, but also negatively affect the venture's revenue growth over time. These are examples of the thorny issues and potential tradeoffs for policymakers and researchers evaluating conditions under which successful policies can outweigh potential costs and crowding-out effects on firms not included in policy initiatives.

As data collection and analytical methods improve, researchers can focus more carefully on the causal effects of various policies. These studies require either experimental methods such as randomized controlled trials (RCTs) or quasi-experimental methods such as regression discontinuity and instrumental variables designs. When applying these enhanced methodologies, researchers uncovered evidence ranging from no policy effects to crowding out of

positive effects that would otherwise have happened (e.g., Cumming & MacIntosh, 2006; Gustafsson, Stephan, Hallman, & Karlsson, 2016; Kolympiris & Klein, 2017). Other studies indicate potential positive effects of public sponsorship (Hottenrott & Lopes-Bento, 2014; Howell, 2017). To understand the mechanisms for generating these positive benefits require a careful identification strategy that differentiates both selection and treatment effects and then assess the relative impact of each (Wang, Li, & Furman, 2017). In a study of over 1,700 ventures that received advisory services from a U.S. Small Business Development Center, entrepreneurs who received sufficient advising time and were willing to learn collaboratively with their business advisers were more likely to achieve growth milestones after accounting for a variety of selection issues (Buffart et al., 2020).

3.3 | Integrating macro and micro perspectives

Of course, macro and micro policies are not independent, within or across levels. The empirical literature on the institutional environment suggests that attributes tend to occur in clusters—for example, political checks and balances and an anti-authoritarian culture (Jellema & Roland, 2011) or the different legal and regulatory features associated with common-law or civil-law systems (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). Certain micro policies may work best when combined with other micro policies, such as financial incentives and networking opportunities (Mohnen & Röller, 2005). Moreover, the same policy may have different effects across institutional environments. As we discuss below, there is little research on how these complementarities affect innovative entrepreneurship, which we see as an opportunity for further work.

4 | THE PAPERS IN THE SPECIAL ISSUE

The papers in the special issue—summarized in Table 2—showcase various methods and empirical contexts for innovation and entrepreneurship policy. They highlight several themes from our macro–micro policy integration framework and wrestle with the tradeoffs associated with policy interventions. Two focus on macro themes (Teodorescu & Kuhn, 2021; Wang, Malik, and Wales, 2021), two address micro themes (Astebro & Hoos, 2021; Stevenson, Kier, & Taylor, 2021), and two incorporate elements of both (Lamine, et al., 2021; Murtinu, 2021).

4.1 | Macro policy focus

Teodorescu and Kuhn (2021) explore a specific policy intervention to encourage entrepreneurial creation and discovery: the U.S. Patent and Trademark Office's development of a "fast-track" patent process to speed up the development and deployment of high-value technologies. In a carefully designed quantitative, empirical study, they take advantage of the quasi-random assignment of patent applications to patent examiners to estimate a causal impact of patent characteristics on innovative outcomes, controlling for the entrepreneur's decision to submit to the fast-track program. They find that small firms with just a few patents are more likely to pursue the expedited path, and that these expedited patents, when granted, are more impactful than similar, nonexpedited patents. The results suggest that this type of policy intervention, even at a macrolevel, can encourage entrepreneurs to pursue innovative technologies more aggressively.

Firms in industries with high R&D investment costs and long lead times for product introductions often communicate with investors using rhetoric that signals an entrepreneurial orientation (EO) favoring a commitment to innovation and product introductions. Concurrently, many innovative industries face considerable headwinds from regulatory oversight slowing the pace of innovation. Wang et al. (2021) investigate how 109 health science firms use market and nonmarket signals during product development and market entry to improve market performance over

TABLE 2 The papers in the special issue

Authors	Title	Research question	Theory/framework	Data/methods	Findings/conclusions
Stevenson, Kier, and Taylor	Do policymakers take grants for granted? A research notes on the efficacy of public sponsorship for innovative entrepreneurship	What are the short- and long-term effects of innovation grants on venture growth and subsequent private investment?	Signaling theory and resourcefulness theory	Quantitative, discontinuous growth modeling of 129 ventures in incubators over 4-year period	An initial public grant increases the rate at which ventures acquire private investment capital over time but decreases the rate at which ventures grow revenue over time. This relationship also differs by firm size
Murtinu	The government whispering to entrepreneurs: Public venture capital, tax reforms and firm productivity	Do government minority shares through VC funding provide strategic advantages in anticipating business shocks?	Resource dependence, board political capital and principal–principal conflicts, public venture capital, productivity, high-tech venture, political capital, government ownership	Quasi-experimental field study comparing treatment effect of staggered tax reforms across countries for European venture capital (VC)-backed companies and comparable non-VC-backed private companies	Post-tax reform effect of public VC backing differs by higher sales value output- enhanced efficiency in the labor factor. A public VC fund's industry or geographic specialization does not represent a contingency for EU firms studied
Teodorescu and Kuhn	The track one pilot program: Who benefits from prioritized patent examination?	What are the determinants and consequences of accelerated patent examination?	Innovation, economics, quantitative research method, uncertainty, strategic entrepreneurship	U.S. patent system data of pilot of fee-based acceleration of patent examination; textual analysis methodology	Small and young firms with limited patent portfolios are most likely to pay for faster patent examination illustrating the strategic importance of the patent system policy for new ventures
Wang, Malik, and Wales	When entrepreneurial orientation meets strict regulations	Does the entrepreneurial orientation of firms in highly regulated industries raise investor concerns related to pre-entry barriers and post-entry risks?	Regulation, entrepreneurial orientation, signaling theory, corporate social responsibility	Archival data of 109 health science companies operating in the United States during 2003–2012	EO and firm value were negatively related indicating investor skepticism of firm expressions of EO. Quality signals of entry commitment and CSR mitigate the negative EO expression-value relationship

TABLE 2 (Continued)

Authors	Title	Research question	Theory/framework	Data/methods	Findings/conclusions
Astebro and Hoos	The effects of a training program to encourage social entrepreneurship: Field-experimental evidence	Do consecutive field experiments with adjustments to skills training modules improve entrepreneurship training outcomes?	Social entrepreneurship, training, leadership, field experiment, randomized controlled trial	Sequential randomized controlled trials of 12-day social entrepreneurship training with adjustments to increase new venture creation during program and post-training start-up	Training improves outcomes, but difficult to distinguish skills training from coaching
Lamine, Anderson, Jack, and Fayolle	Entrepreneurial space and the freedom for entrepreneurship: Institutional settings, policy and action in the space industry	How does entrepreneurial innovation emerge in the space industry and associated industries?	Innovative entrepreneurship, space industry, policy and institutions, heterogeneity of context, institutional theory	Extended 10-year, cascading case study of an innovative start-up in space industry ecosystem including: other start-ups, existing space-related businesses, angel investors support through incubators and Technology Transfer Office influencers in large space companies and space agencies	Context fundamentally shaped enterprise and innovation. The space industry favors established over entrepreneurial firms but creates a context for entrepreneurship innovation in related support industries

time. The authors argue counterintuitively that, in innovative industries, EO signals can dampen rather than bolster market performance. While this signaling downside has appeared recently in crowdfunding research (Kim, Buffart, & Croidieue, 2016), the regulatory regime, time frame, and sophistication of institutional market investors are quite different. Importantly, the paper highlights the strategic challenge of managing the regulatory process within the macro policy domain. Firms seeking to highlight their EO in public relations may find that this signal backfires if investors perceive these statements as window dressing. The authors find that "hard signals" or actions which reducing future legal risk, a commitment to safety, and new product submissions that "keep the innovation pipeline full" mitigate the negative relationship between EO signaling and market performance.

4.2 | Micro policy focus

Public sponsorship of innovative entrepreneurship with potential for higher growth has considerable draw for policy makers who promise job creation to their constituents. Often this sponsorship is in the form of grants to kick start technology commercialization or fund additional growth. This is a common design approach for micro policy interventions. Given the evidence for a "liability of newness" because of limited resources, public innovation grants for entrepreneurship should offer a positive return on investment and level the playing field for new firms relative to established competitors. While there is evidence of positive gains like the SBIR program in the United States (Lerner & Kegler, 2000), even these SBIR findings are mixed (Ko & McKelvie, 2018) with limited scholarly understanding of the behavioral effects of public sponsorship within the organization (Amezcua et al., 2013; Jourdan & Kivleniece, 2017) and externally with potential investors (Lerner & Kegler, 2000).

Stevenson et al. (2021) draw from resourcefulness and signaling theory to examine grant funding for 129 new ventures inside eight U.S.-based incubators (another form of public sponsorship) over a 4-year period. The article exploits discontinuities between pre- and post-funding characteristics to assess short- and long-term effects of grants on firm growth and follow-on private investment. They show that an initial public grant increases the rate at which ventures acquire private investment capital, suggest a signaling effect, while decreasing the rate at which ventures grow revenue—which may be interpreted as a decrease in resourcefulness.

These findings speak jointly to the legitimizing and resource-conservation perspectives on entrepreneurial finance and strategic entrepreneurship literatures. Having limited access to resources induce many startups to bootstrap operations and to conserve or stretch their resources in ways that allow them to accomplish their key goals with maximum effectiveness and minimum resource usage. At the same time, resources are needed for growth, and access to public grants may alleviate some of the pressure for ventures to stretch their resource base. However, Stevenson et al. show that slack resources provided by such grants do not necessarily lead to enhanced long-term growth but may instead diminish new ventures' pressure to grow a revenue base. This is consistent with a large literature on the certification effect of awards, prizes, affiliation with prominent investors, and other signals—suggesting that the effects of grants may be explained by selection, rather than treatment.

"Innovation" can take a variety of forms, including not only substantial technological improvements that have large societal benefits, but also smaller-scale, more incremental innovations that improve the lives of underserved people in local communities—the domain of "social entrepreneurship." Astebro and Hoos (2021) employ a sequential RCT to evaluate the impact of a French social entrepreneurship training program on innovative social outcomes by program participants. As a training intervention, this study falls squarely in the micro policy side of our framework. The program involved training in both entrepreneurial and general leadership skills, as well as coaching from experienced entrepreneurs. After failing to identify a treatment effect in the initial round of the program, the researchers (working with program organizers) designed a second round with a different mix of skills training and an intensification of the coaching element, and participants in this program had substantially more and better entrepreneurial outcomes than those in the control group. The study sheds light not only on the nature and content of entrepreneurship training—a central component in many "micro" approaches to entrepreneurship policy—but also on

the challenges and opportunities for entrepreneurship researchers on conducting RCTs. As such, we hope it will provide a useful guide for further work on entrepreneurship training and other interventions using this increasingly popular method for causal inference.

4.3 | Macro + micro overlap

In his paper studying IPOs for more mature ventures across Europe, Murtinu (2021) examines the extent to which firms backed by Governmental Venture Capital (GVC) in seven European countries benefit from having minority owners in anticipating policy shifts. Exploiting the effect of staggered tax reforms across these countries, he compares the effects of tax reforms on the productivity of GVC-backed firms compared to similar firms with only private investors, finding strong productivity effects driven by increases in sales and more efficient labor inputs. Complementing earlier studies examining the implications of GVC investments for both investee firms as well as authorities (Hellmann & Thiele, 2015), Murtinu's study highlights the advantages of access to information about future policy shifts for new ventures. He also raises broader questions about the governance of innovative firms and the importance of access to political networks (Batjargal et al., 2013; Bruton, Filatotchev, Si, & Wright, 2013; Li & Zhang, 2007). This study draws on both macro and micro policy themes from our framework.

Lamine et al.'s (2021) study of the European space industry takes a more macro perspective, looking at the effects of institutions on enabling and constraining the emergence of a private, entrepreneurial ecosystem for space exploration and discovery, complementing the existing publicly funded space and defense sector. Based on a 10-year, qualitative, inductive study of entrepreneurial space companies and space agencies, they show how institutions both enable and constrain what they call, appropriately enough, "entrepreneurial space," defined as "the extent of room for entrepreneurial change" within an industry or region. In particular, they develop a contrast between the heavily regulated, hierarchically constituted, and closed upstream sector of the space industry (launch vehicles and services, ground control stations, and space payloads) and the more competitive, less heavily regulated, and more entrepreneurial downstream sector (products and services delivered through the use of space assets such as satellite communications networks and earth observation systems). They show how both formal and informal aspects of the institutional environment shape the context in which both sectors operate, how upstream and downstream public and private actors interact in complex ways that both help and harm innovative entrepreneurship in this emerging industry, and overlapping elements of macro and micro policy come together.

5 | CONCLUSIONS AND FUTURE RESEARCH

The special issue provides insight into the nature and effects of public policy interventions on innovative entrepreneurship and its outcomes, institutional background conditions, and institutional heterogeneity. The studies expose several tradeoffs in policy design and across the macro–micro policy framework we propose to organize and evaluate policies for innovative entrepreneurship policies. The papers in the special issue showcase various methodological approaches (longitudinal case studies, quasi-experimental and field experimental methods, computational text analysis, and traditional regression techniques) and highlight new empirical areas (such as the space industry or social entrepreneurship interventions) of key relevance to innovative entrepreneurship policy. The papers contribute to broader theoretical and empirical bodies of literature such as entrepreneurial finance, sponsorship theory, entrepreneurship education, intellectual property rights, and entrepreneurial orientation.

As this special issue reveals, research on entrepreneurship and innovation policy has grown from a specialized area of (mainly) economics to a broader and more diverse field incorporating insights from multiple disciplines. This move has brought richness into our understanding of the conditions, processes, and outcomes by which policy shapes innovative entrepreneurship. Of particular importance, research on entrepreneurship policy and innovation

policy is becoming increasingly sensitive to context. Psychological, sociological, and economic frameworks alike stress the key role of spatial and institutional proximity, and how peers, networks, and relationships shape new innovative ventures (Bell, Chetty, Jaravel, Petkova, & van Reenen, 2019; Eesley & Wang, 2017; Källström, 2019; Stuart & Ding, 2006).

The six papers in this special issue speak to the evolving multidisciplinary and contextual nature of current research. Yet, there are still important gaps in knowledge regarding policy for innovative entrepreneurship that point to important future research areas. For example, instead of starting with particular policies and tracing out their effects, one could start with a desired effect (such as a particular innovation, industrial development, or economic condition) and evaluate competing policies to see what type of policy, or policy mix, is most likely to bring about the intended result (Buffart et al., 2020). Such comparative testing is common, for example, in research educational policy or corporate investment policy in which a budget and goal are fixed (e.g., students' achievement or rate of return on some investment) and decision-makers ask what strategies yield an optimal outcome. This approach is generally lacking in research on entrepreneurship and innovation policy.

Moreover, research could attend to the increasing salience of competing micro policies or rapid macro policy shifts and their effects of innovative entrepreneurship within or across empirical settings. In today's uncertain and rapidly developing world, entrepreneurship is becoming more global and decisions about where to locate new ventures are becoming more sensitive to local policies (McMullen, Wood, & Kier, 2016). Consequently, rapid policy shifts could have a large impact on innovative entrepreneurship (Eberhart, Eesley, & Eisenhardt, 2017) as authorities mimic each other by enacting new policy decisions (Murtinu et al., 2021; Sebhatu, Wennberg, Arora-Jonsson, & Lindberg, 2020). Yet, we still know relatively little about how entrepreneurs react to policies in comparative contexts (e.g., neighboring states, countries, or industries) and how policy discrepancies affect their behavior and the performance of their ventures. More research is also needed on the effectiveness of specific policies under conditions of high uncertainty or complexity.

Finally, most empirical studies on innovative entrepreneurship study either the innovativeness of nascent entrepreneurs running fledging new businesses or, alternatively, the performance of relatively stable ventures reaching a scale of operations when they become eligible for and of interest to policy interventions. We need more research "in the middle" between startups and established firms for policies directed at these recipients. We still know relatively little about how specific policies affect operational, but small-scale, experimental and high-growth new ventures (Haltiwanger, Jarmin, Kulick, & Miranda, 2016). These and other questions highlight that research on policy for innovative entrepreneurship is still maturing and that key contributions may still be in the making. The six papers in this special issue speak to the diversity of research on policy for innovative entrepreneurship.

Clearly, policy mechanisms do not operate consistently worldwide. Through regional, national, and cross-national studies in the United States and Europe, our special issue only provides a partial glimpse into the full range of mechanisms that vary by their local contexts. For example, emerging economies are known for their weak institutional environments (or "institutional voids") which complicate even simple efforts to plan and anticipate future actions—assurances often necessary for innovative entrepreneurship to succeed (Hiatt & Sine, 2014; Kim & Li, 2014). Some entrepreneurial efforts depend on novel technologies, while others depend on predictable business conditions in which forward-looking investments can occur.

Although a macro view on policy conditions would often anticipate that innovative entrepreneurship can prosper in stable conditions, these same kinds of pioneering ventures can still thrive in much more unstable and potentially hostile conditions. For example, among the over 500 "unicorns" worldwide, about 120 are in China and nearly 30 are in India (as of December, 2020) (CB Insights https://www.cbinsights.com/research-unicorn-companies) and operating in regions where entrepreneurs need to be vigilant of their operating conditions. New ventures in these countries must employ multiple strategies that depend on shifting macro institutional conditions to grow their enterprises (Du & Kim, 2021). Ventures in such settings may also depend on different nonmarket strategies such as political networking as a way to minimize the impact of dysfunctional competition and lack of institutional support that hamper their business operations (Li & Zhang, 2007; Du, Kim & Aldrich, 2016). Future research can unpack more carefully the mechanisms into how various policies—or the lack of consistent policies—conditions innovative entrepreneurship.

We are also in the middle of a global challenge undertaken by the United Nations and nearly 200 signatory countries to achieve the Sustainable Development Goals (SDGs). Starting in 2020, the UN has called for a "Decade of Action" during which world leaders, national policymakers, and other stakeholders are encouraged to mobilize behind achieving these goals. Amid significant ongoing geo-political divisions and civil unrest on issues such as climate change and reducing inequalities, we still face persistent problems concerning access to high-quality healthcare, education, clean water, and economic opportunities for billions worldwide. During this Decade of Action, innovative entrepreneurship can certainly be one component solving these issues worldwide (Leach et al., 2012). Future research can investigate if and to what extent global goals such as the SDGs may be accomplished through some combinations of macro policy formulations (within and across multiple countries) and micro policy interventions dedicated to this specific outcome. Even so, we should remain open to the possibility that such problems can be addressed at a variety of levels, by local and private actors in the polycentric model emphasized by Ostrom (Mahoney, McGahan, & Pitelis, 2009).

Up to now, we employed a mostly binary analytical framework that distinguishes policy design and evaluation by their macro or micro emphases. While this separation is analytically convenient, it is not always possible to classify policies into just one category. As Williamson (2000) points out, there are interactions across levels: policymaking is embedded within a particular institutional environment, and private and public actors can attempt to influence the institutional environment in various ways. Moreover, outcomes may depend on interactions across levels; for example, subsidies or tax policy can have different effects under varying institutional conditions (Ács, Autio, & Szerb, 2014; Batjargal et al., 2013). This is particularly true if we also consider the informal parts of the institutional environment such as norms and culture. As noted above, there is considerable work on how informal institutions affect entrepreneurship, but little on how norms and culture interact with formal institutions and targeted, microlevel policies in helping or hindering innovative new firms, products, and markets.

Unfortunately, conducting multilevel studies such as these are complex and require sophisticated designs, data collection, and analytical methods (Du, Kim & Aldrich, 2016). Besides capturing both macrolevel and microlevel characteristics correctly, assessing policy effectiveness requires longitudinal data to see if policy components result in the intended outcomes. With the growing ability to construct large datasets and the accessibility to computing resources to analyze them, we call on researchers to tackle this issue as a next frontier in entrepreneurship and policy studies.

What, then, are the ideal policies for innovative entrepreneurship? The literature to date, including the six papers in this special issue, provides no universal answers, but points to a series of issues that can frame future work in this area: (a) targeted microlevel policies (that favor particular firms, industries, or technologies thought to have high potential commercial or social impact) versus broader, macrolevel policies (the right institutional environment) in which innovative entrepreneurship can flourish, without preconceived notions about who the winners will be; (b) treatment versus selection effects of government programs (i.e., are targeted policies facilitating innovations that otherwise would not have taken place, or are they mainly certifying the people and projects that were already good?); (c) interactions among legal, tax, regulatory, financial, cultural, etc. parts of the micro or macro policy environments; (d) the strengths and weaknesses of alternative forms of public–private partnerships, hybrid models, and the like; and (e) policies that promote entrepreneurship more generally or innovative entrepreneurship specifically. As new impending economic and societal crises erupt and ongoing global challenges persist, the push for more careful design and implementation of policies for innovative entrepreneurship will continue. This provides ample opportunities for scholarly research on the aforementioned topics and other tradeoffs that broadens and deepens our understanding of the role of public policy on strategic entrepreneurship.

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