

Innovation of Chinese POEs and SOEs: The Moderating Role of Marketization

Christopher J. Boudreaux
Associate Professor
Florida Atlantic University
College of Business
Department of Economics
777 Glades Rd, KH 145
Boca Raton, FL 33431 USA
Email: cboudreaux@fau.edu
Phone: 1.561.297.3221

Abstract

Are private-owned enterprises (POEs) more innovative than state-owned enterprises (SOEs) in an emerging economy? Due to political and social connections, SOEs have several advantages over POEs in emerging markets and transition economies, but we hypothesize that these advantages wane when institutional environments prioritize market competition, rule of law, and the rewards to profitable enterprise. In this study, therefore, we explore how marketization moderates the relationship between private or state ownership and innovation. Using data from the World Bank's Enterprise Survey in China, our results suggest that POEs are more innovative than SOEs but only in market-oriented provinces. In provinces that are not market-oriented, SOEs are more innovative than POEs.

Keywords: China, innovation, institutions, marketization, private enterprise, state enterprise

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1. Introduction

Why are some countries more prosperous than others? This question dates back to the 18th century with Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* (Smith, 1776). Most scholars now recognize the importance of institutions in promoting prosperity (Acemoglu et al., 2005; North, 1990; Williamson, 2000) — especially through the channels of entrepreneurship and innovation (Bennett, 2020, 2019; Bjørnskov and Foss, 2016; Bradley and Klein, 2016; Coomes et al., 2013; Gohmann, 2012; Gohmann et al., 2008). China presents a puzzle, however. Despite many obstacles to markets and private enterprise, entrepreneurship has flourished in China (Zhou, 2014, 2013; Zhou and Hall, 2019). If market institutional environments encourage innovation and entrepreneurship and their absence inhibits innovation and entrepreneurship, why then has entrepreneurship in China thrived despite an overall absence of market institutions?

We now know that the success or failure of an emerging market depends largely on the performance of entrepreneurs (McMillan and Woodruff, 2002). However, the success of private enterprises has varied in transition economies like Russia, China, Poland, and Vietnam. In some transition countries, the government impeded the development of private enterprises. Yet, in other economies the government fostered an environment conducive to entrepreneurship (McMillan and Woodruff, 2002). Thus, the government can play a large role in fostering or impeding the success of these transitions (Frye and Shleifer, 1997).

Leveraging insights from institutional economics (Acemoglu et al., 2005; Bylund and McCaffrey, 2017; North, 1990; Williamson, 2000), we propose the performance of private enterprises depends critically on the emerging market's underlying institutional environment. In this study, we investigate whether private enterprises benefit more from a market-oriented environment than state enterprises. Market-oriented environments reduce transaction costs, which tends to favor the performance of private enterprises over state enterprises.

Stated more formally, the purpose of our study is twofold: First, we examine the differences in innovation between private-owned enterprises (POEs) and state-owned enterprises (SOEs) in an emerging market. Second, we investigate whether this difference depends on whether or not the institutional

environment is market-oriented. We answer these questions by combining a sample of Chinese entrepreneurs provided by the World Bank Enterprise Survey with two measure of marketization for Chinese provinces. Together, the dataset encompasses various regions, industries, and provinces with information on the market-orientation of each Chinese province. Consistent with prior research (Boudreaux et al., 2019; Bowen and Clercq, 2008; Estrin et al., 2013; McMullen et al., 2008; Stenholm et al., 2013), our results suggest that market institutions moderate the innovation performance of entrepreneurs. More specifically, we find that in provinces that are not market-oriented, SOEs are more innovative than POEs, but the outcome is reversed in provinces that are market-oriented. Accordingly, we speak to the ongoing conversation on the complex factors of innovation and entrepreneurship activity (Atuahene-Gima, 1996; Autio et al., 2013; Bjørnskov and Foss, 2016; Jiménez-Jiménez and Sanz-Valle, 2011; Kim et al., 2016; Terjesen et al., 2016) as well as the importance of context to entrepreneurship (Zahra, 2007; Zahra et al., 2014)—especially in emerging markets.

To test these hypotheses, we use a sample of entrepreneurs in China provided by the World Bank's Enterprise Survey. We combine this dataset with data from the Provincial Capital Freedom (PCF) Index developed by the China Institute of Public Affairs (CIPA) (Feng and Shoulong, 2011) as well as the National Economic Research Institute (NERI)'s market index (Fan et al., 2017). Our dataset, therefore, contains important information on the quality of the Chinese institutional environment (Ge et al., 2017), which departs from prior studies that utilize macro-level measures of market reforms (Banalieva, Eddleston, & Zellweger, 2015; Peng & Jiang, 2010). Instead, our measure of marketization captures the variation in market environments across Chinese provinces.

These findings have important implications. For entrepreneurs—especially those in emerging markets—our results suggests that private enterprises benefit from a strong protection of property rights, police and court protection, a stable money supply and financial sector afforded to entrepreneurs, and a small public sector relative to the private sector. State enterprises, however, benefit more from political and social connections (Shaheer et al., 2019). For policy makers, the findings indicate that strengthening the foundation of market institutions enables private enterprises to flourish. If the desire of policy is to promote

entrepreneurship and innovation (Acs et al., 2016; Acs and Szerb, 2007; Shane, 2008), encouraging the development of stronger underlying market institutions enhances innovation by private enterprises. For educators, our results shed new light on innovation in transition economies and emerging markets (McMillan & Woodruff, 2002; Park, Li, & Tse, 2006; Svejnar, 2002; Zhou, 2013) and the complex interaction between institutions and innovation (Bjørnskov and Foss, 2016; Boudreaux, 2017; Carlsson, 2006; Fabrizio et al., 2017; Nelson and Nelson, 2002; Terjesen et al., 2016).

2. Theory and hypotheses

2.1. Innovation in emerging markets and transition economies

Both entrepreneurship and innovation serve important roles in emerging markets and transition economies like China (Ge et al., 2017; Tran, 2018; Zhou, 2013, 2014). In transition economies, the means of production were once controlled by government-directed central planners but later transitioned toward capitalism (McMillan and Woodruff, 2002; Svejnar, 2002). Compared to planned economies dominated by large firms and few consumer goods, small and medium-sized firms emerge in transition economies (Park et al., 2006). Transition economies thus create an environment conducive to innovation and entrepreneurship where entrepreneurs supply consumer goods, mobilize savings, and compete with state-created monopoly (McMillan and Woodruff, 2002). There is heterogeneity, however, in the rate and speed of transitions both between countries and *within* countries. Regarding China, Ge et al., (2017, p. 408) explain, “Although pro-market reform policies are set by the Chinese federal government, they are implemented at various levels and speeds by the provincial governments.”

China first began its transition towards privatization under the leadership of Deng Xiaoping in 1978. Reflecting on this transition (Zhou, 1996), Deng Xiaoping recalled, “All sorts of small enterprises boomed in the countryside, as if a strange army appeared suddenly from nowhere” (McMillan and Woodruff, 2002, p. 153). Prior to this transition, private enterprise was forbidden in China (Ge et al., 2017), but by 2005 China had approximately 24 million private enterprises (Loyalka, 2006) and the number of registered

SME's exceeded 4.3 million by 2012 (Ministry of Commerce People's Republic of China, 2012). Despite this impressive feat, China's institutional environment still creates obstacles to private enterprise as Chinese officials continued to discourage entrepreneurship, innovation, and private enterprise activity due to a reluctance to reform legal and market institutions (Zhou, 2014). For instance, the Heritage Index of Economic Freedom ranks China 110 out of 180 ranked countries and categorizes China as "mostly unfree" (Heritage, 2018). Similarly, the Economic Freedom of the World Index ranks China 112 out of 159 countries (Gwartney et al., 2017). As we will come to see, the low ranking of China's institutional environment is crucially important because the institutional environment and entrepreneurship, and innovation are connected (Bruton et al., 2010; Pacheco et al., 2010).

2.2. Innovation by state-owned and private-owned enterprises

Scholars often credit privatization with many successes following post-Socialist transitions (McMillan and Woodruff, 2002). Privatization propels greater enterprise restructuring and entrepreneurship activity (Djankov and Murrell, 2002), and it also allows new entrants to increase competition and erode the once substantial profits of large SOEs operationalized as monopolies (McMillan and Woodruff, 2002). However, although much attention has been given to entrepreneurs' roles in fostering economic growth and job creation (Acs, 2006; Acs and Szerb, 2007; Audretsch et al., 2006; Baumol, 2002, 1986; Baumol and Strom, 2007; Bjørnskov and Foss, 2013), less attention has been given to entrepreneurs' abilities to navigate the uncertainty that emerges during economic transitions (Jackson et al., 1999). During the Chinese post-Socialist transition, for example, entrepreneurs had to navigate a tightrope of enhancing efficiency and productivity while also satisfying state planners. But as environmental characteristics also transitioned toward a market economy, entrepreneurs had to adapt their strategic orientation to satisfy the market rather than state planners (Tan, 2007). We contend POEs are naturally suited to deal with the market disequilibria (Schultz, 1975), which is especially helpful during economic transitions within emerging markets. SOEs, however, might hesitate to invest in a riskier climate (Tan, 2001). We thus expect POEs and SOEs respond differently during economic transitions within emerging markets.

There are several reasons to expect that entrepreneurs of POEs might be more innovative than SOEs. First, privatization alters incentives toward productivity and efficiency. Agency theory (Eisenhardt, 1989; Jensen and Meckling, 1976; Ross, 1973) helps to explain how private and state enterprises respond to these transforming incentives. In agency theory, managers (i.e., agents) of POEs and SOEs often act in their own self-interest, rather than the self-interest of the owners (i.e., principals). Privatization helps reduce these divergent incentives by imposing external and internal control mechanisms such as monitoring, managerial participation in ownership, reward systems, and the board of directors (Cuervo and Villalonga, 2000). The agency problem, therefore, can be minimized by realigning principals' and agents' incentives, and effective monitoring (Dharwadkar et al., 2000). Despite their ability to realign the incentives and monitor agents in POEs, these mechanisms are virtually absent in SOEs. Consequently, agency costs are likely higher for SOEs in market-oriented environments. Moreover, marketization induces change in corporate governance and alters managerial incentives (Bos, 1991; Cornelli and Li, 1997; Sappington and Stiglitz, 1987; Schmidt, 1996). By transforming individuals from managers to entrepreneurs, individuals become the residual claimants of the private enterprise (Zahra et al., 2000), and residual claimants benefit from positive performance while suffering from bad performance. In contrast, managers in SOEs do not face the same profit motive (Hayek, 1945). Instead, managers of SOEs face different incentives that ultimately discourage entrepreneurial behavior and innovation (Niskanen, 1971). Empirical evidence suggests that managers of SOEs are less innovative and more risk averse than entrepreneurs of POEs in the private sector (Tan, 2001). We thus anticipate that entrepreneurs of POEs will attempt to innovate, earn profits, and avoid losses. Managers of SOEs do not face the same incentives and will thus be more likely to rely on their relationships with governments and politicians.

Second, entrepreneurs of private enterprises must make their own decisions (i.e., decentralized decisions) following privatization. Entrepreneurs in POEs have more responsibility to determine the strategic decisions and directions the firm will take. Managers of SOEs, however, are less equipped because the organization's decisions are centrally determined by the state and/or the planning board (Pelikan, 1986). Following the privatization process, the incentives shift the focus toward efficiency and away from a

managerial mindset.¹ “Privatization encourages strategies designed to shape and exploit market imperfections, garner monopolizing rents, collaborate with scarce partners, and exploit relationships with government officials” (Doh, 2000, p. 555). Entrepreneurial firms in China have adopted a strategic mindset that includes speed, stealth, and sound execution, which allows entrepreneurs to take advantage of first-mover advantages in a turbulent environment (Doh, 2000; Tan, 2001). Thus, entrepreneurs in the private sector are better suited to dealing with the uncertainties emerging through market disequilibria (Schultz, 1975). Based on these reasons, we propose the following baseline hypothesis:

Hypothesis 1. Private-owned enterprises will be more innovative than state-owned enterprises

2.3. The moderating effect of market institutions on firm innovation

Institutions are often defined as the “rules of the game” or “constraints” on human behavior (North, 1991, p. 7, 1990; Williamson, 2000). These constraints can either facilitate or impede entrepreneurship and innovative activity by reallocating resources towards market activity and opportunity entrepreneurship (Boudreaux et al., 2019). Although the institutional environment in China is often thought to be improving (Zhou, 2013, 2014), recent work illustrates that reforms have had the opposite effect in some provinces, where the institutional environment is becoming harsher not better (Banalieva et al., 2015). Moreover, although privatization has been heralded with many successes, several exceptions highlight problems associated with emerging markets such as transitioning too quickly (McMillan and Woodruff, 2002). Hence, the difference in innovation between POEs and SOEs likely depends on the presence or absence of market institutions. We thus hypothesize that market-oriented environments moderate the difference in innovation between POEs and SOEs.

¹In centrally planned economies, for instance, decisions were often made by central planners and management only carried out routine orders on behalf of the administration (Pelikan, 1986). Despite possessing power and control (Puffer, 1994), Soviet management was inflexible and discouraged entrepreneurial behavior, which led to low value finished goods (Filatotchev et al., 1999).

There are several reasons to expect that marketization moderates the difference in innovation between POEs and SOEs. When environments are not market-oriented, *unproductive* entrepreneurship flourishes (Baumol, 1990; Sobel, 2008). These environments incentivize entrepreneurs to substitute productive activities (e.g., innovation and price competition) for unproductive activities (e.g., rent seeking, lobbying for subsidies) and destructive activities (establishing/protecting entry barriers), which ultimately lowers productivity and economic growth (Murphy, Shleifer, & Vishny, 1991, 1993). These findings lead researchers to conclude market-oriented environments nurture innovation and entrepreneurship while their absence inhibits it (Banalieva et al., 2015; Bruton et al., 2010; Cuervo-Cazurra and Dau, 2009; Lucas and Boudreaux, 2020; Nikolaev et al., 2018).

Despite the absence of market institutions, some entrepreneurs have thrived in China (Ge et al., 2017). In these environments, political and social connections become relatively more important for entrepreneurship (Zhou, 2013, 2014). Because political connections often substitute for deficient legal and market institutions, *who you know* becomes relatively more important than *what you know* (Boudreaux and Nikolaev, 2018). Here, a clan mentality dominates decision making (Hofstede, 2001). As a result, entrepreneurs wishing for success in such environments must build and maintain relationships with important persons in power. Empirical evidence supports this logic. Despite the weak investor protection afforded by these deficient institutions, reinvestment rates often increase for entrepreneurs who maintain good relationships with politicians (Ge et al., 2017). Due to the relationships with politicians and other important government officials, SOEs should find it easier to leverage their political and social connections. We therefore expect that entrepreneurs of POEs will be less innovative than SOEs in environments that are not market-oriented. Indeed, researchers have found that POEs are more likely to engage in illegal activities in China when they have limited access to institutional resources (Gao and Yang, 2019).

In market-oriented environments, rewards are distributed through the market mechanism that rewards profits and punishes losses (Hayek, 1945). While social connections remain important in these environments (Boudreaux and Nikolaev, 2018), the benefits of insider connections and social ties diminishes in importance (Gwartney et al., 2017). Market institutions promote productive entrepreneurship

and discourage destructive entrepreneurship (Baumol, 1990; Boudreaux et al., 2018). Transition economies like China highlight the relative importance of the market versus the state and the differences between POEs and SOEs. Entrepreneurs from POEs used speed, stealth, and sound executions to establish first-mover advantages when SOEs were unwilling or unable to execute similar risky decisions (Tan, 2001). Moreover, experience from Chinese SOEs reveals that they too must evolve toward a market-oriented approach if they are to survive in an institutional environment that rewards private enterprise creation (Tan, 2007).

In sum, we expect that POEs and SOEs will respond differently to the changing institutional environment. In economies that transition toward privatization, POEs are more likely than SOEs to take risks and make investments (Tan, 2001). The market process, thus, rewards POEs in market-oriented environments. In contrast, political and social connections are relatively more important in environments that are not market-oriented (Ge et al., 2017; Zhou, 2013, 2014). *Who you know* becomes more important than *what you know* in these environments (Hofstede, 2001). As a result, SOEs have an advantage in these environments. Therefore, we expect whether or not POEs will be more innovative than SOEs depends on the type of environment (i.e., whether or not it is market-oriented). This leads us to the following hypothesis:

Hypothesis 2. POEs are more innovative than SOEs in market-oriented environments but less innovative in environments that are not market-oriented.

3. Methods

3.1. Data

We use data from the World Bank's Enterprise Survey of Chinese entrepreneurs to test our hypotheses. This survey was conducted in 2012, spans 25 Chinese cities, 24 industries, and includes 761 observations of which 86 percent are private enterprises, nine percent are mixed (i.e., private and state-owned), and five percent are completely state-owned. We specifically chose this Chinese sample of entrepreneurs because we are interested in examining the composition of private and public owned enterprises. Alternatively, the World Bank provides a panel version of many different countries for its Enterprise survey, but these data cannot be compared to state-owned enterprises. The surveys were implemented following a two stage

procedure. First, a screener applied a questionnaire over the phone to determine eligibility and to make appointments. Second, face-to-face interviews took place with the manager, owner, or director of each establishment.

Table 1

Table 1 reports descriptive statistics. The average provincial-level of capital freedom is 7.50 (on a 10-point scale where higher numbers indicate a higher quality institutional environment). Forty-one percent of entrepreneurs have access to a line of credit but only five percent have outstanding personal loans. Fifty-four percent of all firms have invested in research and development (R&D) in the past three years, 58 percent of firms have created a new product in the last year, and 61 percent of firms have created a new idea. On average, entrepreneurs work 60.5 hours per week and have 18 years of experience in their sector. Most entrepreneurs sell their product throughout China (73 percent). Only nine percent sell their product globally and 18 percent sell their product almost entirely in the local market. Lastly, it is most common for entrepreneurs to market and promote their product on a daily basis, a few times per week, or a few times per month. Only 15 percent use marketing only once in a while and 12 percent never market their product. Table A1 in the online appendix lists the industries covered in the study, and Table A2 in the online appendix lists the Chinese cities covered. Table 2 uses a non-parametric Spearman test² to report the correlations between the variables. The innovation measures are highly correlated with innovation breadth and each other. The marketization indices are positively correlated with innovation breadth and each other. Private enterprises are negatively correlated with our measures of innovation and mixed enterprises are positively correlated with our measures of innovation. Most controls are positively correlated with measures of innovation, though there is heterogeneity.

Table 2

² We use this test, rather than the Pearson correlation, because we have a large mix of dummy and continuous variables. Correlations are similar with either method, however.

3.2. Measures

3.2.1. Dependent variables - Innovation

We measure firm innovation using four measures. First, we include a measure of new product or service innovation (1=the firm introduced new products or services in the last year; 0=otherwise). Second, we include a measure of new ideas (1=the firm does research and develops ideas for new products and services; 0=otherwise). Third, we include a measure of R&D spending (1=the firm has invested in R&D in the previous three years; 0=otherwise). Lastly, consistent with the literature (Leiponen and Helfat, 2010), we include a measure of breadth of innovation. Innovation breadth is a broader measure of innovation, which encompasses innovation from various activities and arenas. We define innovation breadth as a summary measure of the other three measures (i.e., new products and services, new ideas, investments in R&D). We conducted principal component analysis to create this measure. The PCA identified a single latent construct, with an eigenvalue exceeding 1. As a result, we can be confident that all three measures of innovation are related and together serve as an appropriate measure of innovation breadth.

3.2.2. Moderating variables - Marketization

To measure the quality of institutions in China, we use two measures of market institutions. We use multiple measures of institutions, in part, to be consistent with recent pushes to increase replicability of findings (Anderson et al., 2019). First, we use the Provincial Capital Freedom (PCF) Index developed by the China Institute of Public Affairs (CIPA) (Feng and Shoulong, 2011). The index consists of four areas: (1) Government and legal institutional factors, (2) Economic factors, (3) Money supply and financial development, and (4) The level of marketization in financial markets (see Table 5). Government and legal institutional factors (area 1) measure the level of government involvement in the economy. Provinces with more government involvement score lower on Area 1 of the PCF index. Economic factors (area 2) reflect the extent of private enterprise and entrepreneurial activity. Provinces with more entrepreneurial activity score higher on the PCF index. Money supply and financial development (area 3) measures macroeconomic

and financial stability and liquidity in the economy. Provinces with lower rates of inflation, smaller standard deviations of inflation rates, greater bank deposits and bankcards per capita, and amounts of cash as a share of income score higher on the PCF index. Lastly, marketization of financial markets (area 4) measures the development and importance of non-state financial institutions within the banking and financial system. Provinces where financial intermediaries face greater competition and that have a greater number of non-state involvement in the stock market score higher on the PCF index. A total of 21 components aggregate together to create these four areas and the overall PCF index. The PCF index is scored on a scale from 0 to 10 where higher numbers indicate more freedom and lower numbers indicate less freedom at the provincial-level.

Our second measure uses the Marketization index by the National Economic Research Institute (NERI) (Fan et al., 2017). The NERI marketization measures the degree of economic freedom in Chinese provinces. It has been compared to the Economic Freedom of the World index (Zhou and Hall, 2017) and used to investigate its relationship with entrepreneurship in China (Zhou, 2014). The NERI index is similar to the PCF index but measures five major dimensions of marketization: (1) relationship between government and market, (2) development of non-state economy, (3) goods market development, (4) factors market development, and (5) legal frameworks. The NERI index is measured on a scale from 0 to 10. We provide more details on both measures and their specific measurement in Tables A3 and A4 in the online appendix.

3.2.3. Explanatory variables – Private and State Enterprises

Privatization has been shown to be an important antecedent of entrepreneurial growth (Wright et al., 2000; Zahra et al., 2000; Zahra and Dianne Hansen, 2000) and is linked to reductions in corruption (Clarke and Xu, 2004). We measure private enterprise ownership through three categories: private enterprise (1 = 100% private ownership; 0 otherwise), state-owned (1 = 0% private ownership; 0 otherwise), and mixed ownership (1 = 1-99% private ownership; 0 otherwise). In our empirical analysis, we compare the outcomes between private ownership and the other two ownership categories.

3.2.4. Controls

We also include several control variables related to innovation and entrepreneurship. We control for individual-level aspects of the financial environment important to innovation and entrepreneurship (Acs and Szerb, 2007; De Clercq et al., 2013; Dushnitsky and Lenox, 2005; Fairlie and Krashinsky, 2012; Robb and Robinson, 2014). Specifically, we include a measure for entrepreneurs' lines of credit and outstanding personal loans. Both measures are dummy coded (1=entrepreneur has access to a line of credit; 0=otherwise) and (1=entrepreneur has outstanding personal loans; 0=otherwise). Similarly, we include a measure of firm capital. Firms that have greater access to capital investments are likely to be more innovative. We measure capital as the value of machinery, vehicles, equipment, land, and building. We transform this measure using the natural logarithm.

There is a debate in the literature on the effect of firm size on firm growth and performance (Cooper et al., 1989; Davis et al., 1998; Hall, 1986; Neumark et al., 2011). Consistent with Gibrat's law, contributions show that once the dynamic of firm age has been considered, the relationship between firm size and job creation disappears (Haltiwanger et al., 2013). Accordingly, we control for both the size and age of the firm. We measure firm size as the natural logarithm of the number of employees and measure firm age as the number of years that have passed since the start of the business.

We include several variables that account for firm-specific effort, sector-specific experience, and industry expertise that might positively influence firm-level innovation. Hours per week captures the intensity of entrepreneurial effort associated with greater business performance (Fairlie and Robb, 2009). We measure this variable as the average number of hours worked on a weekly basis. We also control for entrepreneurs' industry experience. Prior experience as an entrepreneur supports new venture survival and performance (Delmar and Shane, 2006), and founders of high-growth ventures are more likely to have work experience and advanced training related to their field relative to micro-businesses (Friar and Meyer, 2003). We also include a measure of sector experience that captures entrepreneurs' familiarity with specific industries. We measure this variable as the number of years of experience working in the industry. We also include a measure of the obstacles to competition firms experience. Competitive markets are likely to focus

on innovation rather than constructing barriers to innovation (Loury, 1979; Schumpeter, 1942). Because free entry and exit increases competition allowing for creative destruction by innovators, we expect fewer obstacles to competition to be associated with more innovation. We measure obstacles to competition on a scale from 0 to 4 (0=no obstacle; 1=minor obstacle; 2=moderate obstacle; 3=severe obstacle; 4=very severe obstacle). Franchising can also be beneficial to entrepreneurs (Combs et al., 2004). During early stages, franchisors provide needed resources to franchisees (Castrogiovanni et al., 2006). We include a measure of franchising (1=the firm is part of a franchise; 0=otherwise). Importantly, we also adjust our model for industry-specific differences (Boudreaux, 2019). Our study includes 24 dummy indicators that encompass the different industries. Table A1 in the online appendix lists the industries covered in the study.

We also measure firms' scope of the market for their products and services. We expect larger and more successful innovators to expand their enterprise efforts toward larger national and international markets, which is linked to higher venture performance (Zahra and Garvis, 2000; Zahra and Hayton, 2008). We measure the scope of the market on a scale from 1 to 3 (1=the firm sells the product mostly in the local market; 2=the firm sells the product in a national market; 3=the firm sells the product nationally and internationally). We anticipate entrepreneurs focusing their efforts on a national or international scale will be more likely to innovate and invest in R&D.

Product marketing has also been shown to benefit firm performance (Lu and Beamish, 2004; Saeed et al., 2002). Advertising can enhance profitability, especially in foreign markets (Lu and Beamish, 2004). Product promotion increases awareness and exposure but too much might lead to diminishing returns (Broussard, 2000). We measure advertising frequency on a scale from 1 to 5 (1=the firm never uses marketing; 2=the firm uses marketing only once in a while (i.e., rarely); 3=the firm uses marketing once per week (i.e. sometimes); 4=the firm using marketing several times per week (i.e., frequently); 5=the firm uses marketing daily). We expect that firms with a greater emphasis on advertising will be more likely to innovate.

3.3. Models

We use the Hybrid model (Allison, 2009) to test our hypotheses. The Hybrid model, also known as the between-within (BW) estimator, is useful in instances where explanatory variables of interest are invariant (e.g., the marketization index), but random effects estimation might be inappropriate. Our sample comprises 761 firms nested in 25 cities. In our case, the two marketization indices are measured at the provincial-level. As a result, the market indices are invariant within provinces because the market index is identical for all firms within the same province. Hence fixed-effects estimation does not permit estimating the effect of the market index on firm-level innovation. We considered estimating a random-effects (i.e., random-intercept) model or hierarchical linear-model (HLM), but these models require a strong assumption that the model's covariates are uncorrelated with the random effects (Antonakis et al., 2019; Wooldridge, 2010). Consequently, we used the Hybrid model, which permits estimation of regressors that are invariant within provinces but also incorporates fixed effects estimation for all regressors that do vary within the province. The Hybrid model is thus a multi-level (i.e., panel-data) model that estimates the within-provincial effect for firm-level (level 1) variables (i.e., fixed-effects) and estimates the between-provincial effect for provincial-level (level 2) variables (i.e., random-effects). The Hybrid model also includes a provincial-level random intercept.³ To be consistent with prior research (Ge et al., 2017), we use Variance Inflation Factor (VIF) to check for multicollinearity between independent and dependent variables. The VIFs for the independent variables ranged from 1.02 to 1.93, which is less than the “rule of thumb” of 10. This indicates no serious multicollinearity problem with the data (Greene, 2003).

4. Results

4.1. Main findings

We report the regression results in Table 3, which tests our hypotheses that private-owned enterprises (POEs) are more innovative than state-owned enterprises (SOEs) (Hypothesis 1), and this difference in

³ To assess robustness, we replicated our findings with both random-effects and fixed-effects estimation. Overall, we find similar results with all three models. See the online appendix for more details.

innovation depends on the presence or absence of market institutions (Hypothesis 2). We test these hypotheses using four measures of innovation. We observe a negative relationship between POEs and innovation in all models. Specifically, when we use the PCF market index in columns 1-4, these results indicate that, when compared to SOEs, POEs are less likely to have a new idea ($\beta=-3.469$; $p=0.149$), new product ($\beta=-4.905$; $p=0.059$), invest in R&D ($\beta=-4.307$; $p=0.052$), and innovate in breadth ($\beta=-1.833$; $p=0.008$). We observe similar relationships in columns 5-8 when using the NERI market index. However, marketization attenuates this difference in innovation. Specifically, the PCF market index attenuates the difference in innovation measured by new ideas ($\beta=0.453$; $p=0.154$), new products ($\beta=0.630$; $p=0.061$), investments in R&D ($\beta=0.551$; $p=0.058$), and innovation in breadth ($\beta=0.236$; $p=0.009$). As a result, POEs are less innovative when compared to SOEs in provinces that are not market-oriented but more innovative in market-oriented provinces. Hence we find support for Hypothesis 2 but not Hypothesis 1.

Table 3

To better understand and interpret these results, we plot the moderating effect in Figures 1 and 2. In Figure 1, we observe a negative relationship between the market index (NERI) and firm innovation for SOEs yet little to no decline for POEs. That is, SOEs are more innovative in the absence of market institutions but more innovative in regions that are market-oriented. Figure 2 corroborates these findings. Although similar, the main difference between the two figures is POEs are more likely to innovate than SOEs as the environment becomes more market-oriented. In Figure 2, we observe a positive relationship between the PCF market index and innovation for POEs and a negative relationship for SOEs. Overall, these findings reinforce our support for Hypothesis 2.

Figures 1 and 2

4.2. Matching analysis

Although we found support for Hypothesis 2, it is plausible our results are confounded by unobserved variation that might affect a firm’s privatization choice or its innovation efforts. Hence, to adjust for this source of endogeneity bias, we perform a matching analysis, which accounts for the variation in firm innovation among similarly matched firms. Specifically, we match treated firms using the Coarsened Exact Matching (CEM) algorithm (Blackwell et al., 2009; Iacus et al., 2012). We choose CEM over alternative matching methods like the propensity score. Unlike propensity score matching, CEM does not estimate the probability of being treated. Rather, CEM coarsens the variables into strata and applies weights to firms depending on how “close” they are to treated firms. Our matching procedure reduces the distance between all variables, which can be observed by comparing the *L1* statistic before ($L1=0.296615$) and after ($L1=6.65E-16$) the matching treatment⁴. Overall, we observe a decrease in the *L1* statistic for all variables, which indicates a successful match (Iacus et al., 2012).

Table 4

We replicate our earlier findings using the CEM analysis in Table 4. Overall, our findings are qualitatively similar, which suggests the endogeneity bias is relatively minor. Specifically, when we use the PCF market index in columns 1-4, we observe POEs are less likely than SOEs to have a new idea ($\beta=-2.699$; $p=0.195$), new product ($\beta=-2.547$; $p=0.335$), invest in R&D ($\beta=-2.254$; $p=0.181$), and innovate in breadth ($\beta=-1.187$; $p=0.054$). When we use the NERI index in columns 5-8, we also observe POEs are less likely than SOEs to have a new idea ($\beta=-3.043$; $p=0.056$), new product ($\beta=-1.639$; $p=0.314$), invest in R&D ($\beta=-3.873$; $p=0.039$), and innovate in breadth ($\beta=-1.297$; $p=0.016$). Like before, marketization attenuates this difference in innovation. Specifically, the PCF market index in columns 1-4 attenuates the difference in innovation measured by new ideas ($\beta=0.382$; $p=0.194$), new products ($\beta=0.364$; $p=0.268$), investments in R&D ($\beta=0.309$; $p=0.125$), and innovation in breadth ($\beta=0.172$; $p=0.028$). The NERI market index in columns 5-8 also attenuates this difference in innovation measured by new ideas ($\beta=0.403$; $p=0.057$), new

⁴ More details are available in the online appendix.

products ($\beta=0.228$; $p=0.216$), investments in R&D ($\beta=0.501$; $p=0.016$), and innovation in breadth ($\beta=0.177$; $p=0.007$). As a result, POEs are less innovative when compared to SOEs in provinces that are not market-oriented but more innovative in market-oriented provinces. Hence, we find support for Hypothesis 2 but not Hypothesis 1.

5. Discussion and conclusion

By leveraging insights from institutional economics and the literature on privatization during transitions, we propose POEs will be more innovative than SOEs when operating in market-oriented environments. In environments that do not prioritize market competition, respect the rule of law, and do not reward private enterprises, we expect that SOEs will be more innovative. To test our hypotheses, we combined the World Bank's Enterprise Survey data for Chinese entrepreneurs with data from the Provincial Capital Freedom (PCF) Index developed by the China Institute of Public Affairs (CIPA) (Feng and Shoulong, 2011) as well as the marketization index developed by the National Economic Research Institute (NERI). We found evidence supporting our hypothesis that the difference in innovation between POEs and SOEs depends critically on the presence or absence of market institutions. Our findings suggest that the success of private enterprises depends on whether institutions support market competition, the rule of law, and private enterprises more generally.

These findings have important implications for both theoretical and practical reasons. First, our results are important for entrepreneurs. Although studies highlight how the transition toward privatization can alter organizational cultures, promote risk taking, and spur innovation and entrepreneurship (Tan, 2001; Zahra & Hansen, 2000), our results suggest that private enterprise activity like innovation will be more successful in market-oriented environments. In the absence of these formal institutions, political and social connections become relatively more important. Our study thus highlights the importance of context (Zahra, 2007; Zahra et al., 2014). Entrepreneurs can benefit from this study by learning about the importance of the

institutional context, especially for those whom are considering foreign direct investment in emerging markets and thus might be less familiar with these environments.

Second, our findings are important for policy makers. Because unproductive entrepreneurship is more prominent and productive entrepreneurship is less prominent in non market-oriented institutional environments (Baumol, 1990; Sobel, 2008), policy makers can advocate for market reforms to channel entrepreneurship activity toward greater productivity, innovation, and growth (Baumol, 2002, 1986; Baumol and Strom, 2007). Caution is needed, however, because studies note that gradual changes are more successful than rapid privatization efforts (Spicer et al., 2000). Nevertheless, if the desire of policy is to promote entrepreneurship and innovation (Acs et al., 2016; Acs and Szerb, 2007; Schot and Steinmueller, 2018; Shane, 2008), finding ways to support private enterprise activity can be a viable strategy to achieve these goals—if the underlying environment is supportive of productive entrepreneurship.

Third, our results have important implications for educators. The primary contribution of our study shows the difference in innovation between POEs over SOEs depends critically on the existence of market institutions. These findings shed new light on entrepreneurship in transition economies (McMillan & Woodruff, 2002; Park, Li, & Tse, 2006; Svejnar, 2002; Zhou, 2013). More importantly, however, we add to the literature that argues for a more nuanced understanding of the relationship between institutions, entrepreneurship, and innovation (Audretsch et al., 2018; Boudreaux et al., 2019; Estrin et al., 2013; Stenholm et al., 2013). These relationships are complex (Bjørnskov and Foss, 2016; Kim et al., 2016; Terjesen et al., 2016), and our findings, thus, are consistent with recent contributions that offered nuanced approaches in transition economies and emerging markets (Ge et al., 2017; Tran, 2018).

5.1. Limitations and future research

As any empirical study, we face a number of limitations. We chose to examine a sample of Chinese entrepreneurs in an attempt to increase our understanding of the complex interaction between institutional environments and innovation for private and state enterprises in an emerging economies setting. While consistent with prior research in transition and emerging markets (Ge et al., 2017; Puffer et al., 2010), our

findings apply only to entrepreneurs in China and caution should be given to the generalizability of our results. Future research, thus, should examine these relationships in alternative transition economies and emerging markets to determine the external validity of our findings. With that said, recent advances highlight that institutions have profound effects in other transition economies like Vietnam (Tran, 2018), and although this study examines the relative institutional dynamics on entrepreneurship for both new entrants and incumbents, we find these results encouraging for the applicability of institutions and innovation in alternative settings.

Relatedly, while our sample takes advantage of important regional and industrial heterogeneities in innovation, it only includes a single-year of observation. To alleviate some of the associated empirical problems with cross-sectional data, we used panel-data models, such as the fixed effects, random effects, and hybrid model, to adjust for differences between industries, cities, and provinces. These methods allow us to compare the performances of entrepreneurs to *similar* entrepreneurs *within* the same industry and geographic context (Audretsch et al., 2018). We therefore feel reasonably assured that our results are not driven by the omission of key confounders or otherwise important sources of regional heterogeneity. Future research, however, could improve upon our study by incorporating longitudinal designs that not only include important measures of regional and industrial classification but also incorporate multiple observations for the *same* organization over time. This research design would offer researchers an opportunity to enhance our understanding of the intricacies involved between private and/or state-enterprises and their innovation activity. For instance, researchers found the speed of institutional reform (Banalieva et al., 2015) and the speed of privatization are important considerations for the success of entrepreneurs in transitioning settings (Spicer et al., 2000). Future research could extend this logic to address whether slow and gradual improvements in the privatization process offer more benefits than a rapidly changing privatization that creates uncertainty during reform.

Finally, our SOE firms account for only five percent of the sample. Ideally, we would have a larger number of SOEs in our sample, but the World Bank focused primarily on POEs in their survey. We attempted to mitigate this concern by also comparing the performance of POEs to mixed-ownership firms

and by investigating our research question in several different model specifications. Overall, our results are robust to these different specifications, which provides additional encouragement, but the usual disclaimers apply.

In sum, we find that POEs are more innovative than SOEs in market-oriented environments but less innovative than SOEs in non market-oriented environments. Our results thus suggest that private enterprises are innovative, even in an emerging market context, as long as the environment is supportive. These findings highlight the importance of context to innovation and entrepreneurship, especially in transition economies and emerging markets.

References

- Acemoglu, D., Johnson, S., Robinson, J.A., 2005. Chapter 6 Institutions as a Fundamental Cause of Long-Run Growth, in: Durlauf, P.A. and S.N. (Ed.), *Handbook of Economic Growth*. Elsevier, pp. 385–472.
- Acs, Z., 2006. How is entrepreneurship good for economic growth? *innovations* 1, 97–107. <https://doi.org/10.1162/itgg.2006.1.1.97>
- Acs, Z., Åstebro, T., Audretsch, D., Robinson, D.T., 2016. Public policy to promote entrepreneurship: a call to arms. *Small Bus Econ* 47, 35–51. <https://doi.org/10.1007/s11187-016-9712-2>
- Acs, Z., Szerb, L., 2007. Entrepreneurship, Economic Growth and Public Policy. *Small Bus Econ* 28, 109–122. <https://doi.org/10.1007/s11187-006-9012-3>
- Allison, P.D., 2009. *Fixed effects regression models*. SAGE publications.
- Anderson, B.S., Wennberg, K., McMullen, J.S., 2019. Editorial: Enhancing quantitative theory-testing entrepreneurship research. *Journal of Business Venturing* 34, 105928. <https://doi.org/10.1016/j.jbusvent.2019.02.001>
- Antonakis, J., Bastardo, N., Rönkkö, M., 2019. On ignoring the random effects assumption in multilevel models: Review, critique, and recommendations. *Organizational Research Methods* 1094428119877457.
- Atuahene-Gima, K., 1996. Market orientation and innovation. *Journal of business research* 35, 93–103.
- Audretsch, D.B., Belitski, M., Desai, S., 2018. National Business Regulations and City Entrepreneurship in Europe: A Multilevel Nested Analysis. *Entrepreneurship Theory and Practice* 1042258718774916. <https://doi.org/10.1177/1042258718774916>
- Audretsch, D.B., Keilbach, M.C., Lehmann, E.E., 2006. *Entrepreneurship and Economic Growth*. Oxford University Press, USA.
- Autio, E., Pathak, S., Wennberg, K., 2013. Consequences of cultural practices for entrepreneurial behaviors. *Journal of International Business Studies* 44, 334–362. <https://doi.org/10.1057/jibs.2013.15>
- Banalieva, E.R., Eddleston, K.A., Zellweger, T.M., 2015. When do family firms have an advantage in transitioning economies? Toward a dynamic institution-based view. *Strategic Management Journal* 36, 1358–1377.
- Baumol, W.J., 2002. *The free-market innovation machine: Analyzing the growth miracle of capitalism*. Princeton university press.
- Baumol, W.J., 1990. Entrepreneurship: Productive, Unproductive, and Destructive. *Journal of Political Economy* 98, 893–921. <https://doi.org/10.1086/261712>

- Baumol, W.J., 1986. Entrepreneurship and a century of growth. *Journal of Business Venturing* 1, 141–145.
- Baumol, W.J., Strom, R.J., 2007. Entrepreneurship and economic growth. *Strategic Entrepreneurship Journal* 1, 233–237. <https://doi.org/10.1002/sej.26>
- Bennett, D.L., 2020. Local institutional heterogeneity & firm dynamism: Decomposing the metropolitan economic freedom index. *Small Business Economics* 1–19.
- Bennett, D.L., 2019. Local economic freedom and creative destruction in America. *Small Bus Econ.* <https://doi.org/10.1007/s11187-019-00222-0>
- Bjørnskov, C., Foss, N., 2013. How Strategic Entrepreneurship and The Institutional Context Drive Economic Growth. *Strategic Entrepreneurship Journal* 7, 50–69. <https://doi.org/10.1002/sej.1148>
- Bjørnskov, C., Foss, N.J., 2016. Institutions, Entrepreneurship, and Economic Growth: What Do We Know and What Do We Still Need to Know? *The Academy of Management Perspectives* 30, 292–315. <https://doi.org/10.5465/amp.2015.0135>
- Blackwell, M., Iacus, S., King, G., Porro, G., 2009. Cem: Coarsened Exact Matching in Stata. *The Stata Journal* 9, 524–546. <https://doi.org/10.1177/1536867X0900900402>
- Bos, D., 1991. Privatization: a theoretical treatment. OUP Catalogue.
- Boudreaux, C.J., 2019. The Importance of Industry to Strategic Entrepreneurship: Evidence from the Kauffman Firm Survey. *Journal of Industry, Competition and Trade.* <https://doi.org/10.1007/s10842-019-00310-7>
- Boudreaux, C.J., 2017. Institutional quality and innovation: some cross-country evidence. *Journal of Entrepreneurship and Public Policy* 6, 26–40. <https://doi.org/10.1108/JEPP-04-2016-0015>
- Boudreaux, C.J., Nikolaev, B., 2018. Capital is not enough: opportunity entrepreneurship and formal institutions. *Small Bus Econ* 1–30. <https://doi.org/10.1007/s11187-018-0068-7>
- Boudreaux, C.J., Nikolaev, B., Holcombe, R., 2018. Corruption and destructive entrepreneurship. *Small Bus Econ* 51, 181–202. <https://doi.org/10.1007/s11187-017-9927-x>
- Boudreaux, C.J., Nikolaev, B.N., Klein, P., 2019. Socio-cognitive traits and entrepreneurship: The moderating role of economic institutions. *Journal of Business Venturing* 34, 178–196.
- Bowen, H.P., Clercq, D.D., 2008. Institutional context and the allocation of entrepreneurial effort. *J Int Bus Stud* 39, 747–767. <https://doi.org/10.1057/palgrave.jibs.8400343>
- Bradley, S.W., Klein, P., 2016. Institutions, Economic Freedom, and Entrepreneurship: The Contribution of Management Scholarship. *The Academy of Management Perspectives* 30, 211–221. <https://doi.org/10.5465/amp.2013.0137>
- Broussard, G., 2000. How advertising frequency can work to build online advertising effectiveness. *International Journal of Market Research* 42, 1–13.
- Bruton, G.D., Ahlstrom, D., Li, H., 2010. Institutional Theory and Entrepreneurship: Where Are We Now and Where Do We Need to Move in the Future? *Entrepreneurship Theory and Practice* 34, 421–440. <https://doi.org/10.1111/j.1540-6520.2010.00390.x>
- Bylund, P.L., McCaffrey, M., 2017. A theory of entrepreneurship and institutional uncertainty. *Journal of Business Venturing* 32, 461–475. <https://doi.org/10.1016/j.jbusvent.2017.05.006>
- Carlsson, B., 2006. Internationalization of innovation systems: A survey of the literature. *Research Policy* 35, 56–67. <https://doi.org/10.1016/j.respol.2005.08.003>
- Castrogiovanni, G.J., Combs, J.G., Justis, R.T., 2006. Shifting Imperatives: An Integrative View of Resource Scarcity and Agency Reasons for Franchising. *Entrepreneurship Theory and Practice* 30, 23–40. <https://doi.org/10.1111/j.1540-6520.2006.00108.x>
- Clarke, G.R., Xu, L.C., 2004. Privatization, competition, and corruption: how characteristics of bribe takers and payers affect bribes to utilities. *Journal of Public Economics* 88, 2067–2097.
- Combs, J.G., Michael, S.C., Castrogiovanni, G.J., 2004. Franchising: A Review and Avenues to Greater Theoretical Diversity. *Journal of Management* 30, 907–931. <https://doi.org/10.1016/j.jm.2004.06.006>

- Coomes, P.A., Fernandez, J., Gohmann, S.F., 2013. The Rate of Proprietorship Among Metropolitan Areas: The Impact of the Local Economic Environment and Capital Resources. *Entrepreneurship Theory and Practice* 37, 745–770. <https://doi.org/10.1111/j.1540-6520.2012.00511.x>
- Cooper, A.C., Woo, C.Y., Dunkelberg, W.C., 1989. Entrepreneurship and the initial size of firms. *Journal of Business Venturing* 4, 317–332. [https://doi.org/10.1016/0883-9026\(89\)90004-9](https://doi.org/10.1016/0883-9026(89)90004-9)
- Cornelli, F., Li, D.D., 1997. Large shareholders, private benefits of control, and optimal schemes of privatization. *The RAND Journal of Economics* 585–604.
- Cuervo, A., Villalonga, B., 2000. Explaining the Variance in the Performance Effects of Privatization. *AMR* 25, 581–590. <https://doi.org/10.5465/amr.2000.3363520>
- Cuervo-Cazurra, A., Dau, L.A., 2009. Promarket Reforms and Firm profitability in Developing Countries. *AMJ* 52, 1348–1368. <https://doi.org/10.5465/amj.2009.47085192>
- Davis, S.J., Haltiwanger, J.C., Schuh, S., 1998. Job creation and destruction. MIT Press Books 1.
- De Clercq, D., Lim, D., Oh, C., 2013. Individual-Level Resources and New Business Activity: The Contingent Role of Institutional Context. *Entrepreneurship Theory and Practice* 37, 303–330. <https://doi.org/10.1111/j.1540-6520.2011.00470.x>
- Delmar, F., Shane, S., 2006. Does experience matter? The effect of founding team experience on the survival and sales of newly founded ventures. *Strategic Organization* 4, 215–247. <https://doi.org/10.1177/1476127006066596>
- Dharwadkar, B., George, G., Brandes, P., 2000. Privatization in Emerging Economies: An Agency Theory Perspective. *AMR* 25, 650–669. <https://doi.org/10.5465/amr.2000.3363533>
- Djankov, S., Murrell, P., 2002. Enterprise Restructuring in Transition: A Quantitative Survey. *Journal of Economic Literature* 40, 739–792. <https://doi.org/10.1257/002205102760273788>
- Doh, J.P., 2000. Entrepreneurial privatization strategies: Order of entry and local partner collaboration as sources of competitive advantage. *Academy of Management Review* 25, 551–571.
- Dushnitsky, G., Lenox, M.J., 2005. When do incumbents learn from entrepreneurial ventures?: Corporate venture capital and investing firm innovation rates. *Research Policy* 34, 615–639. <https://doi.org/10.1016/j.respol.2005.01.017>
- Eisenhardt, K.M., 1989. Agency Theory: An Assessment and Review. *AMR* 14, 57–74. <https://doi.org/10.5465/amr.1989.4279003>
- Estrin, S., Korosteleva, J., Mickiewicz, T., 2013. Which institutions encourage entrepreneurial growth aspirations? *Journal of Business Venturing* 28, 564–580. <https://doi.org/10.1016/j.jbusvent.2012.05.001>
- Fabrizio, K.R., Poczter, S., Zelner, B.A., 2017. Does innovation policy attract international competition? Evidence from energy storage. *Research Policy* 46, 1106–1117. <https://doi.org/10.1016/j.respol.2017.04.003>
- Fairlie, R.W., Krashinsky, H.A., 2012. Liquidity Constraints, Household Wealth, and Entrepreneurship Revisited. *Review of Income and Wealth* 58, 279–306. <https://doi.org/10.1111/j.1475-4991.2011.00491.x>
- Fairlie, R.W., Robb, A.M., 2009. Gender differences in business performance: evidence from the Characteristics of Business Owners survey. *Small Bus Econ* 33, 375. <https://doi.org/10.1007/s11187-009-9207-5>
- Fan, G., Wang, X., Yu, J., 2017. NERI Index of Marketization of China's Provinces: 2016 Report.
- Feng, X., Shoulong, M., 2011. Capital Freedom in China: 2011 Annual Report. Huaxia Publishing House, Beijing.
- Filatovchev, I., Wright, M., Buck, T., Zhukov, V., 1999. Corporate entrepreneurs and privatized firms in Russia, Ukraine, and Belarus. *Journal of Business Venturing* 14, 475–492.
- Friar, J.H., Meyer, M.H., 2003. Entrepreneurship and Start-Ups in the Boston Region: Factors Differentiating High-Growth Ventures from Micro-Ventures. *Small Business Economics* 21, 145–152. <https://doi.org/10.1023/A:1025045828202>
- Frye, T., Shleifer, A., 1997. The Invisible Hand and the Grabbing Hand. *The American Economic Review* 87, 354–358.

- Gao, Y., Yang, H., 2019. Does Ownership Matter? Firm Ownership and Corporate Illegality in China. *J Bus Ethics*. <https://doi.org/10.1007/s10551-019-04264-y>
- Ge, J., Stanley, L.J., Eddleston, K., Kellermanns, F.W., 2017. Institutional deterioration and entrepreneurial investment: The role of political connections. *Journal of Business Venturing* 32, 405–419. <https://doi.org/10.1016/j.jbusvent.2017.04.002>
- Gohmann, S.F., 2012. Institutions, Latent Entrepreneurship, and Self-Employment: An International Comparison. *Entrepreneurship Theory and Practice* 36, 295–321. <https://doi.org/10.1111/j.1540-6520.2010.00406.x>
- Gohmann, S.F., Hobbs, B.K., McCrickard, M., 2008. Economic Freedom and Service Industry Growth in the United States. *Entrepreneurship Theory and Practice* 32, 855–874. <https://doi.org/10.1111/j.1540-6520.2008.00259.x>
- Greene, W.H., 2003. *Econometric analysis*. Pearson Education India.
- Gwartney, J., Lawson, R., Hall, J., 2017. *Economic Freedom of the World 2017 Annual Report*. The Fraser Institute.
- Hall, B.H., 1986. The relationship between firm size and firm growth in the US manufacturing sector. NBER.
- Haltiwanger, J., Jarmin, R.S., Miranda, J., 2013. Who creates jobs? Small versus large versus young. *Review of Economics and Statistics* 95, 347–361.
- Hayek, F.A., 1945. The Use of Knowledge in Society. *The American Economic Review* 35, 519–530.
- Heritage, 2018. 2018 Index of Economic Freedom.
- Hofstede, G., 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. SAGE Publications.
- Iacus, S.M., King, G., Porro, G., 2012. Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis* 20, 1–24. <https://doi.org/10.1093/pan/mpr013>
- Jackson, J.E., Klich, J., Poznanska, K., 1999. Firm creation and economic transitions. *Journal of Business Venturing* 14, 427–450. [https://doi.org/10.1016/S0883-9026\(98\)00029-9](https://doi.org/10.1016/S0883-9026(98)00029-9)
- Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305–360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jiménez-Jiménez, D., Sanz-Valle, R., 2011. Innovation, organizational learning, and performance. *Journal of business research* 64, 408–417.
- Kim, P.H., Wennberg, K., Croidieu, G., 2016. Untapped riches of meso-level applications in multilevel entrepreneurship mechanisms. *The Academy of Management Perspectives* 30, 273–291.
- Leiponen, A., Helfat, C.E., 2010. Innovation objectives, knowledge sources, and the benefits of breadth. *Strategic Management Journal* 31, 224–236. <https://doi.org/10.1002/smj.807>
- Loury, G.C., 1979. Market Structure and Innovation. *The Quarterly Journal of Economics* 93, 395–410. <https://doi.org/10.2307/1883165>
- Loyalka, M.D., 2006. A Chinese Welcome for Entrepreneurs. *Business Week Online*.
- Lu, J.W., Beamish, P.W., 2004. International Diversification and Firm Performance: The S-curve Hypothesis. *AMJ* 47, 598–609. <https://doi.org/10.5465/20159604>
- Lucas, D.S., Boudreaux, C.J., 2020. National regulation, state-level policy, and local job creation in the United States: A multilevel perspective. *Research Policy* 49, 103952. <https://doi.org/10.1016/j.respol.2020.103952>
- McMillan, J., Woodruff, C., 2002. The Central Role of Entrepreneurs in Transition Economies. *Journal of Economic Perspectives* 16, 153–170. <https://doi.org/10.1257/089533002760278767>
- McMullen, J.S., Bagby, D.R., Palich, L.E., 2008. Economic Freedom and the Motivation to Engage in Entrepreneurial Action. *Entrepreneurship Theory and Practice* 32, 875–895. <https://doi.org/10.1111/j.1540-6520.2008.00260.x>
- Ministry of Commerce People's Republic of China, 2012. URL <http://english.mofcom.gov.cn/>
- Murphy, K.M., Shleifer, A., Vishny, R.W., 1993. Why is rent-seeking so costly to growth? *The American Economic Review* 83, 409–414.

- Murphy, K.M., Shleifer, A., Vishny, R.W., 1991. The Allocation of Talent: Implications for Growth. *Q J Econ* 106, 503–530. <https://doi.org/10.2307/2937945>
- Nelson, R.R., Nelson, K., 2002. Technology, institutions, and innovation systems. *Research Policy, Innovation Systems* 31, 265–272. [https://doi.org/10.1016/S0048-7333\(01\)00140-8](https://doi.org/10.1016/S0048-7333(01)00140-8)
- Neumark, D., Wall, B., Zhang, J., 2011. Do small businesses create more jobs? New evidence for the United States from the National Establishment Time Series. *The Review of Economics and Statistics* 93, 16–29.
- Nikolaev, B., Boudreaux, C.J., Palich, L.E., 2018. Cross-Country Determinants of Early Stage Necessity and Opportunity-Motivated Entrepreneurship: Accounting for Model Uncertainty. *Journal of Small Business Management*. <https://doi.org/10.1111/jsbm.12400>
- Niskanen, W., 1971. *Bureaucracy and representative government*. Aldine-Atherton, Inc., Chicago & New York.
- North, D.C., 1991. Institutions. *Journal of Economic Perspectives* 5, 97–112. <https://doi.org/10.1257/jep.5.1.97>
- North, D.C., 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Pacheco, D.F., York, J.G., Dean, T.J., Sarasvathy, S.D., 2010. The Coevolution of Institutional Entrepreneurship: A Tale of Two Theories. *Journal of Management* 36, 974–1010. <https://doi.org/10.1177/0149206309360280>
- Park, S.H., Li, S., Tse, D.K., 2006. Market liberalization and firm performance during China’s economic transition. *J Int Bus Stud* 37, 127–147. <https://doi.org/10.1057/palgrave.jibs.8400178>
- Pelikan, P., 1986. The formation of incentive mechanisms in different economic systems. IUI Working Paper.
- Peng, M.W., Jiang, Y., 2010. Institutions Behind Family Ownership and Control in Large Firms. *Journal of Management Studies* 47, 253–273. <https://doi.org/10.1111/j.1467-6486.2009.00890.x>
- Puffer, S.M., 1994. Understanding the bear: A portrait of Russian business leaders. *Academy of Management Perspectives* 8, 41–54.
- Puffer, S.M., McCarthy, D.J., Boisot, M., 2010. Entrepreneurship in Russia and China: The impact of formal institutional voids. *Entrepreneurship theory and practice* 34, 441–467.
- Robb, A.M., Robinson, D.T., 2014. The Capital Structure Decisions of New Firms. *Rev Financ Stud* 27, 153–179. <https://doi.org/10.1093/rfs/hhs072>
- Ross, S.A., 1973. The Economic Theory of Agency: The Principal’s Problem. *The American Economic Review* 63, 134–139.
- Saeed, K.A., Hwang, Y., Grover, V., 2002. Investigating the Impact of Web Site Value and Advertising on Firm Performance in Electronic Commerce. *International Journal of Electronic Commerce* 7, 119–141. <https://doi.org/10.1080/10864415.2002.11044264>
- Sappington, D.E., Stiglitz, J.E., 1987. Privatization, information and incentives. *Journal of policy analysis and management* 6, 567–585.
- Schmidt, K.M., 1996. The costs and benefits of privatization: an incomplete contracts approach. *The Journal of Law, Economics, and Organization* 12, 1–24.
- Schot, J., Steinmueller, W.E., 2018. Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy* 47, 1554–1567. <https://doi.org/10.1016/j.respol.2018.08.011>
- Schultz, T.W., 1975. The Value of the Ability to Deal with Disequilibria. *Journal of Economic Literature* 13, 827–846.
- Schumpeter, J.A., 1942. *Socialism, capitalism and democracy*. Harper and Brothers.
- Shaheer, N., Yi, J., Li, S., Chen, L., 2019. State-Owned Enterprises as Bribe Payers: The Role of Institutional Environment. *J Bus Ethics* 159, 221–238. <https://doi.org/10.1007/s10551-017-3768-z>
- Shane, S., 2008. *The Illusions of Entrepreneurship: The Costly Myths That Entrepreneurs, Investors, and Policy Makers Live By*. Yale University Press.

- Smith, A., 1776. *The Wealth of Nations*, annotated edition. ed. Bantam Classics, New York, N.Y.
- Sobel, R.S., 2008. Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, *The Economics of Entrepreneurship* 23, 641–655.
<https://doi.org/10.1016/j.jbusvent.2008.01.004>
- Spicer, A., McDermott, G.A., Kogut, B., 2000. Entrepreneurship and Privatization in Central Europe: The Tenuous Balance Between Destruction and Creation. *AMR* 25, 630–649.
<https://doi.org/10.5465/amr.2000.3363531>
- Stenholm, P., Acs, Z., Wuebker, R., 2013. Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity. *Journal of Business Venturing*, Special Issue: Institutions, Entrepreneurs, Community 28, 176–193. <https://doi.org/10.1016/j.jbusvent.2011.11.002>
- Svejnár, J., 2002. Transition Economies: Performance and Challenges. *Journal of Economic Perspectives* 16, 3–28. <https://doi.org/10.1257/0895330027058>
- Tan, J., 2007. Phase transitions and emergence of entrepreneurship: The transformation of Chinese SOEs over time. *Journal of Business Venturing* 22, 77–96.
<https://doi.org/10.1016/j.jbusvent.2005.09.002>
- Tan, J., 2001. Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs. *Journal of Business Venturing* 16, 359–376.
[https://doi.org/10.1016/S0883-9026\(99\)00056-7](https://doi.org/10.1016/S0883-9026(99)00056-7)
- Terjesen, S., Hessels, J., Li, D., 2016. Comparative International Entrepreneurship A Review and Research Agenda. *Journal of Management* 42, 299–344.
<https://doi.org/10.1177/0149206313486259>
- Tran, H.T., 2018. Institutional quality and market selection in the transition to market economy. *Journal of Business Venturing*. <https://doi.org/10.1016/j.jbusvent.2018.07.001>
- Williamson, O.E., 2000. The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature* 38, 595–613. <https://doi.org/10.1257/jel.38.3.595>
- Wooldridge, J.M., 2010. *Econometric analysis of cross section and panel data*. MIT press.
- Wright, M., Hoskisson, R.E., Busenitz, L.W., Dial, J., 2000. Entrepreneurial Growth Through Privatization: The Upside of Management Buyouts. *AMR* 25, 591–601.
<https://doi.org/10.5465/amr.2000.3363522>
- Zahra, S.A., 2007. Contextualizing theory building in entrepreneurship research. *Journal of Business Venturing*, Current Research - Traditional Questions 22, 443–452.
<https://doi.org/10.1016/j.jbusvent.2006.04.007>
- Zahra, S.A., Dianne Hansen, C., 2000. Privatization, entrepreneurship, and global competitiveness in the 21st century. *Competitiveness Review: An International Business Journal* 10, 83–103.
- Zahra, S.A., Garvis, D.M., 2000. International corporate entrepreneurship and firm performance: The moderating effect of international environmental hostility. *Journal of Business Venturing* 15, 469–492. [https://doi.org/10.1016/S0883-9026\(99\)00036-1](https://doi.org/10.1016/S0883-9026(99)00036-1)
- Zahra, S.A., Hayton, J.C., 2008. The effect of international venturing on firm performance: The moderating influence of absorptive capacity. *Journal of Business Venturing* 23, 195–220.
<https://doi.org/10.1016/j.jbusvent.2007.01.001>
- Zahra, S.A., Ireland, R.D., Gutierrez, I., Hitt, M.A., 2000. Introduction to Special Topic Forum Privatization and Entrepreneurial Transformation: Emerging Issues and a Future Research Agenda. *AMR* 25, 509–524. <https://doi.org/10.5465/amr.2000.3363324>
- Zahra, S.A., Wright, M., Abdelgawad, S.G., 2014. Contextualization and the advancement of entrepreneurship research. *International Small Business Journal* 32, 479–500.
<https://doi.org/10.1177/0266242613519807>
- Zhou, K.X., 1996. *How the farmers changed China: power of the people*. Westview Press, Inc.
- Zhou, W., 2014. Regional institutional development, political connections, and entrepreneurial performance in China's transition economy. *Small Business Economics* 43, 161–181.
- Zhou, W., 2013. Political connections and entrepreneurial investment: Evidence from China's transition economy. *Journal of Business Venturing* 28, 299–315.

Zhou, Y., Hall, J., 2019. The Impact of Marketization on Entrepreneurship in China: Recent Evidence. *American Journal of Entrepreneurship* 12, 31–55.

Zhou, Y., Hall, J., 2017. The Sinuous Dragon: Economic Freedom and Economic Growth in China. *Academy of Economics and Finance Journal* 8, 19–24.

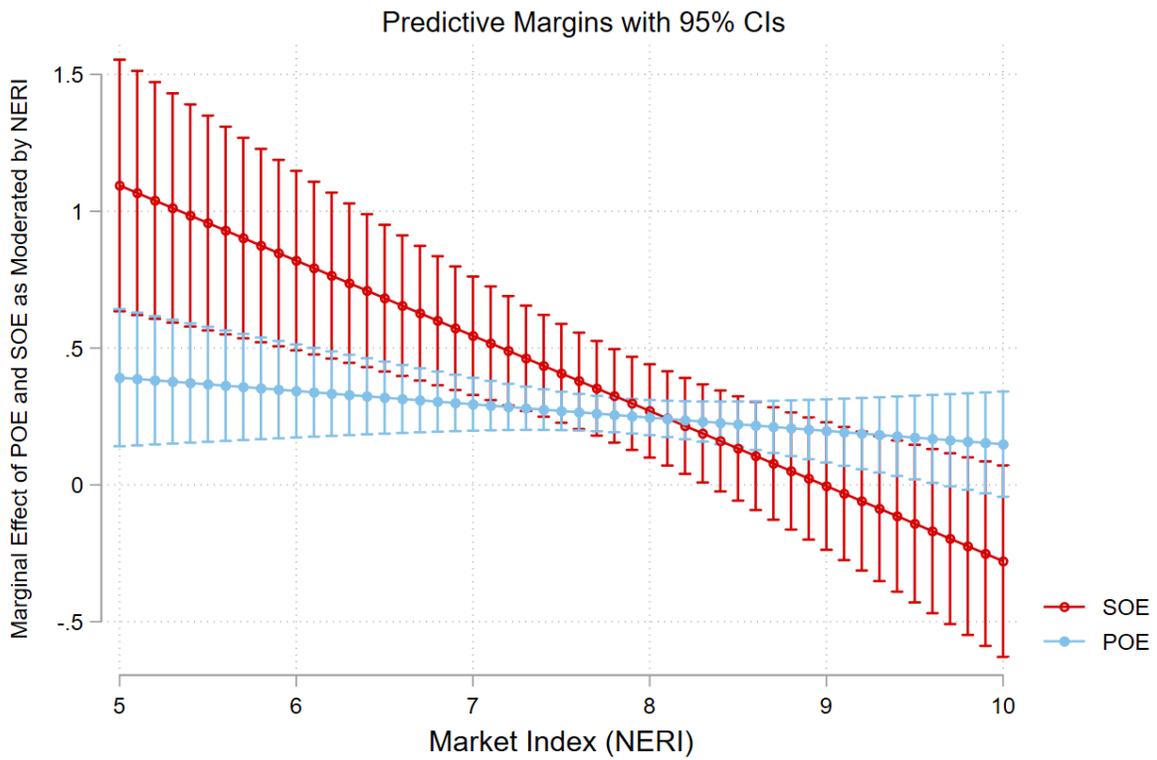


Figure 1. Effect of Marketization on POE’s and SOE’s Innovation Breadth

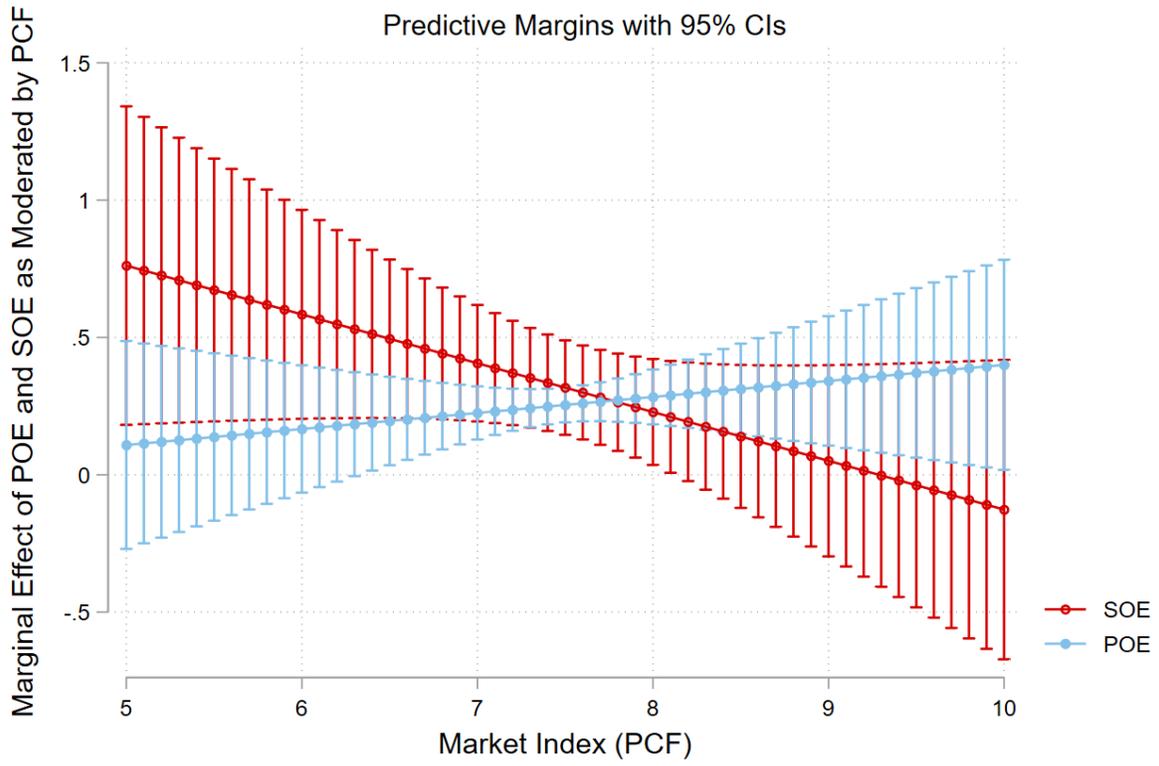


Figure 2. Effect of Marketization on POE's and SOE's Innovation Breadth

Table 1: Measures and descriptive statistics.

Variables	Measures	Mean	SD
<i>Dependent variables</i>			
Innovation breadth	A summary index comprised of three components: 1) new product; 2) new ideas; and 3) R&D. Created by principal component analysis.	0.26	0.98
New product	1= if the firm has sold a new product in the last year; 0 otherwise	0.58	0.49
New ideas	1= if the firm has thought of a new idea in the last year; 0 otherwise	0.61	0.49
R&D	1= if the firm has invested in R&D in the past 3 years; 0 otherwise	0.54	0.50
<i>Explanatory variables</i>			
Private-owned enterprise (POE)	1= if the firm is privately owned; 0 otherwise	0.86	0.35
State-owned enterprise (SOE)	1= if the firm is state owned; 0 otherwise	0.05	0.20
Mixed ownership	1= if the firm is partly owned by private and state interests; 0 otherwise	0.09	0.31
PCF's market index ^a	Provincial Capital Freedom (PCF) index developed by the China Institute of Public Affairs (CIPA). The index consists of four areas: (1) Government and legal institutional factors, (2) Economic factors, (3) Money supply and financial development, and (4) The level of marketization in financial markets	7.50	1.15
NERI's market index ^a	Marketization index by the National Economic Research Institute (NERI).	7.86	1.48
<i>Control variables</i>			
Credit line	1= if entrepreneur has access to a line of credit; 0 otherwise	0.41	0.49
Personal loans outstanding	1= if entrepreneur has any outstanding personal loans; 0 otherwise	0.05	0.22
Capital (log)	Natural logarithm of the value of firm capital. Capital includes machinery, vehicles, equipment, land, and buildings.	13.66	1.81
Firm size	Natural logarithm of the number of employees	3.46	1.21
Firm age	The number of years that have passed since the start of the business	13.26	7.55
Hours per week	Number of hours worked per week	60.52	26.63
Sector experience	Number of years of experience working in the industry	18.05	7.70
Obstacles to competition	On a scale from 0 to 4, respondents rate whether competition is an obstacle to daily operations: 0 = no obstacle; 1 = minor obstacle; 2 = moderate obstacle; 3 = severe obstacle; 4 = very severe obstacle	0.85	0.88
Franchise	1= if the firm is considered an establishment that is part of a larger organization; 0 otherwise	0.12	0.32
Scope of market	Scored on a scale from 1 to 3, this variable measures the scope of the firm's market. This variable is scored 1 if sold mostly in local market, 2 if sold mostly in a national market, and 3 if sold nationally and internationally.	1.95	0.51
Advertising frequency	Scored on a scale from 1 to 5, this variable measures the frequency of advertising (1=never; 2= rarely; 3=sometime; 4=frequently; 5=daily).	3.77	1.23
Industries	Twenty-three dummy variables capturing twenty-four industries		

Notes. ^aSee the online appendix for more details on the NERI and PCF marketization index.

Table 2: Correlation matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
<i>Dependent variables</i>																					
Innovation breadth	[1]	1																			
New product	[2]	0.77	1																		
New ideas	[3]	0.58	0.28	1																	
R&D	[4]	0.85	0.43	0.30	1																
<i>Explanatory variables</i>																					
Private enterprise	[5]	-0.16	-0.11	-0.11	-0.13	1															
State enterprise	[6]	0.01	0.00	0.01	0.00	-0.53	1														
Mixed enterprise	[7]	0.19	0.13	0.13	0.15	-0.81	-0.07	1													
NERI	[8]	0.08	-0.03	0.06	0.14	-0.03	0.03	0.01	1												
PCF	[9]	0.09	-0.04	0.10	0.14	-0.04	0.03	0.03	0.95	1											
<i>Control variables</i>																					
Firm size	[10]	0.20	0.06	0.17	0.22	-0.21	0.07	0.19	0.01	0.05	1										
Capital (log)	[11]	0.26	0.19	0.11	0.25	-0.13	0.05	0.12	0.04	0.02	0.36	1									
Sector experience	[12]	0.10	-0.01	0.09	0.13	-0.02	0.02	0.01	-0.02	-0.05	0.18	0.09	1								
Scope of Market	[13]	0.02	-0.04	0.09	0.02	-0.12	0.16	0.03	0.01	0.02	0.20	0.13	0.13	1							
Franchise	[14]	0.17	0.14	0.15	0.11	-0.11	0.06	0.09	-0.04	-0.04	0.15	0.15	0.05	0.09	1						
Obstacles to competition	[15]	0.04	0.08	0.00	0.01	0.03	0.00	-0.03	0.16	0.16	0.00	-0.04	-0.06	-0.08	-0.02	1					
Advertising frequency	[16]	0.38	0.25	0.33	0.30	-0.10	0.05	0.08	0.18	0.17	0.15	0.21	0.02	0.06	0.05	0.03	1				
Credit line	[17]	0.19	0.05	0.17	0.22	-0.11	0.02	0.12	0.23	0.29	0.26	0.21	0.10	0.04	0.05	0.03	0.03	1			
Personal loans	[18]	-0.01	0.02	0.00	-0.02	0.04	-0.05	-0.01	-0.03	-0.01	-0.03	-0.05	-0.02	-0.04	-0.03	0.04	-0.03	0.06	1		
Firm age	[19]	0.14	0.09	0.13	0.11	-0.04	-0.06	0.09	0.01	0.00	0.04	0.10	0.36	-0.01	0.03	0.01	0.10	0.10	-0.02	1	
Hours per week	[20]	0.05	0.10	0.01	0.01	0.04	-0.07	0.00	-0.29	-0.33	-0.03	0.04	-0.07	0.02	-0.08	-0.06	0.01	-0.10	0.01	-0.09	1

Notes. Spearman non-parametric correlation matrix used. N = 761 observations. Correlations $|0.065|$ are statistically significant, i.e., $p < 0.05$.

Table 3: Innovation Results

	Market Index (PCF)				Market Index (NERI)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	New Ideas	New Products	R&D	Innovation Breadth	New Ideas	New Products	R&D	Innovation Breadth
<i>Explanatory Variables</i>								
POE	-3.469 (2.40)	-4.905* (2.60)	-4.307* (2.21)	-1.833*** (0.69)	-3.252* (1.82)	-3.571** (1.81)	-4.774*** (1.76)	-1.832*** (0.56)
Market Index	-0.838* (0.45)	-0.677 (0.46)	0.063 (0.36)	-0.178 (0.10)	-0.830*** (0.27)	-0.688** (0.27)	-0.271 (0.24)	-0.275*** (0.07)
<i>Interaction</i>								
POE x Market Index	0.453 (0.31)	0.630* (0.33)	0.551* (0.29)	0.236*** (0.09)	0.404* (0.22)	0.430* (0.22)	0.587*** (0.22)	0.226*** (0.07)
<i>Control Variables</i>								
Firm size	0.142 (0.10)	-0.058 (0.09)	0.261*** (0.09)	0.051 (0.03)	0.145 (0.09)	-0.056 (0.09)	0.265*** (0.09)	0.053* (0.03)
Capital (log)	0.023 (0.06)	0.278*** (0.06)	0.109* (0.06)	0.064*** (0.01)	0.021 (0.06)	0.275*** (0.06)	0.106* (0.06)	0.064*** (0.01)
Sector Experience	0.040*** (0.01)	0.011 (0.01)	0.045*** (0.01)	0.015*** (0.00)	0.040*** (0.01)	0.011 (0.01)	0.046*** (0.01)	0.015*** (0.00)
Scope of Market	0.572*** (0.20)	-0.207 (0.19)	0.136 (0.19)	0.062 (0.06)	0.553*** (0.20)	-0.225 (0.19)	0.123 (0.19)	0.053 (0.06)
Franchise	0.980*** (0.34)	0.757** (0.33)	0.432 (0.31)	0.287*** (0.10)	0.985*** (0.34)	0.777** (0.32)	0.446 (0.31)	0.293*** (0.10)
Obstacles to Competition	0.089 (0.12)	0.047 (0.11)	-0.023 (0.12)	0.014 (0.03)	0.100 (0.12)	0.058 (0.11)	-0.016 (0.12)	0.021 (0.03)
Advertising Frequency	0.494*** (0.08)	0.293*** (0.08)	0.432*** (0.08)	0.195*** (0.02)	0.496*** (0.08)	0.297*** (0.08)	0.447*** (0.08)	0.197*** (0.02)
Credit Line	0.381* (0.22)	0.272 (0.21)	0.546** (0.21)	0.174** (0.07)	0.395* (0.22)	0.276 (0.21)	0.550** (0.21)	0.173** (0.07)
Personal Loans	0.377 (0.44)	0.597 (0.43)	-0.051 (0.42)	0.117 (0.14)	0.355 (0.44)	0.581 (0.43)	-0.109 (0.42)	0.103 (0.14)
Firm Age	0.013 (0.02)	-0.017 (0.01)	-0.027* (0.01)	-0.006 (0.00)	0.012 (0.01)	-0.017 (0.01)	-0.027** (0.01)	-0.006 (0.00)
Hours Per Week	-0.004 (0.01)	0.009* (0.00)	0.006 (0.00)	0.002 (0.00)	-0.004 (0.00)	0.009* (0.00)	0.006 (0.00)	0.002 (0.00)
Constant	18.83*** (6.82)	11.657* (6.69)	-10.349** (4.777)	2.282 (1.45)	17.620*** (5.87)	10.365* (5.91)	-8.659* (4.59)	2.278* (1.34)
Industry Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial-level Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Variance of random intercept	0.318	0.331	0.034	0.039	0.202	0.255	0.056	0.035
% of variance, ρ	8.83	9.13	1.01	6.28	5.79	7.19	1.67	5.73
Number of Observations	758	758	760	761	758	758	760	761

Notes. Standard errors in parentheses. All models estimated using the Hybrid model (i.e., between-within (BW) estimator). Models 1-3 and 5-7 estimated with logit regression and Models 4 and 8 estimated with linear regression. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Matching Results

	Market Index (PCF)				Market Index (NERI)			
	New Ideas (1)	New Products (2)	R&D (3)	Innovation Breadth (4)	New Ideas (5)	New Products (6)	R&D (7)	Innovation Breadth (8)
<i>Explanatory Variables</i>								
POE	-2.699 (2.08)	-2.547 (2.64)	-2.254 (1.68)	-1.187* (0.61)	-3.043* (1.59)	-1.639 (1.63)	-3.873** (1.87)	-1.297** (0.53)
Market Index	-0.932** (0.44)	-0.296 (0.48)	0.411 (0.34)	-0.095 (0.15)	-0.948*** (0.19)	-0.378 (0.29)	-0.105 (0.24)	-0.181** (0.09)
<i>Interaction Variables</i>								
POE x Market Index	0.382 (0.29)	0.364 (0.32)	0.309 (0.20)	0.172** (0.07)	0.403* (0.21)	0.228 (0.18)	0.501** (0.20)	0.177*** (0.06)
<i>Control Variables</i>								
Firm size	0.173 (0.12)	-0.165 (0.11)	0.255*** (0.09)	0.034 (0.03)	0.188 (0.11)	-0.161 (0.11)	0.267*** (0.09)	0.036 (0.03)
Capital (log)	0.031 (0.05)	0.338*** (0.07)	0.165** (0.06)	0.080*** (0.01)	0.025 (0.05)	0.336*** (0.07)	0.154** (0.07)	0.079*** (0.02)
Sector Experience	0.027* (0.02)	0.021 (0.01)	0.038** (0.01)	0.014*** (0.00)	0.027* (0.01)	0.021 (0.01)	0.039** (0.01)	0.014*** (0.00)
Scope of Market	0.202 (0.23)	0.280 (0.28)	0.432* (0.24)	0.135 (0.09)	0.169 (0.23)	0.264 (0.28)	0.427* (0.25)	0.126 (0.09)
Franchise	0.751* (0.39)	0.951** (0.45)	0.494* (0.26)	0.307*** (0.08)	0.731* (0.39)	0.957** (0.45)	0.487* (0.27)	0.306*** (0.08)
Obstacles to Competition	0.172 (0.13)	-0.010 (0.09)	0.088 (0.13)	0.029 (0.03)	0.193 (0.13)	-0.001 (0.09)	0.104 (0.13)	0.035 (0.03)
Advertising Frequency	0.465*** (0.11)	0.352*** (0.08)	0.412*** (0.08)	0.194*** (0.02)	0.468*** (0.11)	0.353*** (0.08)	0.427*** (0.08)	0.196*** (0.02)
Credit Line	0.443* (0.24)	0.241 (0.21)	0.708*** (0.18)	0.216*** (0.06)	0.463* (0.24)	0.243 (0.22)	0.739*** (0.19)	0.219*** (0.06)
Personal Loans	0.516 (0.69)	0.606 (0.37)	-0.089 (0.41)	0.117 (0.16)	0.496 (0.68)	0.602 (0.36)	-0.188 (0.41)	0.103 (0.16)
Firm Age	0.020** (0.00)	-0.017 (0.01)	-0.024** (0.01)	-0.006** (0.00)	0.020** (0.00)	-0.017 (0.01)	-0.026** (0.01)	-0.006** (0.00)
Hours Per Week	-0.006 (0.00)	0.008 (0.00)	0.006 (0.00)	0.002 (0.00)	-0.006 (0.00)	0.008 (0.00)	0.005 (0.00)	0.002 (0.00)
Constant	21.40*** (7.76)	8.061 (7.63)	-15.54* (5.39)	0.713 (2.43)	20.71*** (6.89)	7.608 (7.50)	-12.11* (4.93)	1.008 (2.50)
Industry Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial-level Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Variance of random intercept	0.316** (0.124)	0.376*** (0.13)	0.026 (0.085)	0.207 (0.161)	0.143* (0.082)	0.330** (0.158)	0.061 (0.08)	0.201 (0.18)
% of variance, ρ	8.76	10.26	0.77	6.84	4.17	9.12	1.83	6.51
Observations	693	689	691	761	693	689	691	761

Note. Standard errors in parentheses. All models estimated using the Hybrid model (i.e., between-within (BW) estimator). Models 1-3 and 5-7 estimated with logit regression and Models 4 and 8 estimated with linear regression. Coarsened Exact Matching (CEM) weights applied to all models. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$