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Entrepreneurship in Singapore

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Citation

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Abstract

Singapore has completed the phase of catch-up growth and needs to find a new engine of growth. Entrepreneurship can contribute to a nation's productivity growth. The purpose of this article is twofold. First, I present a theoretical framework, along with empirical evidence, to understand government interventions aiming at boosting entrepreneurship. Second, using the framework, I discuss whether Singapore's current policies are suitable for helping entrepreneurship. The theory demonstrates four reasons why government intervention is needed: (1) resource misallocation, (2) positive externality, (3) entrepreneurial human capital, and (4) tax and default policies. Singapore's government has implemented various policies that potentially fix market failures and hence boost entrepreneurship. Going forward, focusing on internalizing positive externality and improving entrepreneurial human capital could generate the highest payoff for Singapore's economy. Related, attracting high-potential startup firms, regardless of their nationality, would be beneficial given that high-potential startup firms can generate synergy with local firms and create more local employment. Finally, allowing more debt forgiveness for failed entrepreneurs can be considered.

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1 Introduction

Entrepreneurship has been considered the key factor for economic development in the economics literature. For example, Schumpeter [1934] argues entrepreneurs play a key role in economic development through innovation: the creation of a new product, a new method of production, the opening of a new market, the capture of a new supply source, and a new organisation of industry. Schumpeter's idea about entrepreneurship has been formalized by many economics models in which innovations by entrepreneurs generate endogenous long-run economic growth (e.g., Romer [1990]).

Recognizing the importance of their role in the economy, governments all around the world have been implementing a variety of policies to boost entrepreneurship. In this article, I present a theoretical framework, along with empirical evidence, to understand government interventions aiming at boosting entrepreneurship. Using the framework, I discuss whether the current policies in Singapore are suitable for helping entrepreneurship.

The theoretical framework demonstrates situations in which government intervention is needed. First, market frictions can prevent efficient resource allocation. In an ideal situation, better entrepreneurs are supposed to receive a larger amount of funds. Due to frictions in the financial market, however, an entrepreneur with a superb business idea may not finance a business project. Second, entrepreneurial activities generate social gains, and the market mechanism does not internalize the social gains. For example, although entrepreneurial activities often benefit other entrepreneurs, entrepreneurs only consider their private returns. As a result, the socially desired level of entrepreneurial activities may not be achieved. Third, entrepreneurial productivity (or management skills) can be low due to market frictions such as financial or informational frictions. Finally, tax and default policies can inevitably affect entrepreneurial activities, and carefully designing such policies can improve efficiency.

After presenting related empirical findings, I discuss entrepreneurship policies in Singapore. Singapore's government has implemented various policies that address the four situations mentioned above.

For example, the government provides loan programs for small/medium enterprises and subsidies for innovation activities. Going forward, focusing on internalizing positive externality and improving entrepreneurial human capital seem to generate the highest payoff for Singapore's economy. Growing industries, such as e-commerce, fintech, and artificial intelligence, require better ideas. With the growing private equity/venture capital industry in Singapore, a private entity would finance the later-stage capital as long as a firm shows high growth potential. However, the supply of great ideas and innovation can be limited due to market failures, which is where the government should step in.

Related, attracting high-potential startup firms, regardless of their nationality, would be beneficial given that high-potential startup firms can generate synergy (or positive externality) with local firms and create more local employment. Finally, allowing more debt forgiveness for failed entrepreneurs can be considered. Some failures may be due to a lack of entrepreneurial ability, but some are bad luck. Providing a second chance for a highly able entrepreneur hit by a bad shock could improve efficiency.

The paper is organized as follows. Section 2 presents the theoretical framework that rationalizes government intervention. Section 3 documents the related empirical findings. Section 4 discusses the current status of business dynamism and government policies in Singapore, and section 5 concludes.

2 Theoretical framework

In this section, I present a model that rationalizes government interventions aiming at boosting entrepreneurship. The model is based on Evans and Jovanovic [1989]. Agents in the economy, who live one period, are characterized by two types of ability: entrepreneurial and worker ability. Agents have different amounts of wealth. For simplification, the payoff as a worker, denoted by w, is assumed to be the same for all agents. $F(\theta, A)$ represents the distribution of agents over entrepreneurial ability (θ) and wealth (A). As a benchmark, I assume agents can borrow with a risk-free gross interest rate

r without any restriction. The payoff as an entrepreneur (y) is given:

$$y = \max_{k} \mathbb{E}[\{\theta k^{\alpha} - rk\}\epsilon] - \eta, \quad \alpha \in (0,1), \tag{1}$$

where k refers to the amount of capital investment, η captures a fixed cost for starting a business, and ϵ is an income shock after investment. I assume the expected value of the income shock is 1 ($\mathbb{E}[\epsilon] = 1$).

The optimal investment as an entrepreneur is characterized by $k^{*}(\theta) = \left(\frac{\alpha\theta}{r}\right)^{\frac{1}{1-\alpha}}$. An agent becomes an entrepreneur if and only if the expected payoff as an entreprneur is greater than the wage:

$$\theta k^{*}(\theta)^{\alpha} - rk^{*}(\theta) - \eta > w. \tag{2}$$

Note the left-hand side of equation (2) is increasing with respect to θ, and therefore a cutoff $(\hat{\theta})$ exists such that agents whose θ is above $\hat{\theta}$ become entrepreneurs and agents whose θ is below $\hat{\theta}$ become workers. Agents' wealth does not play a role in the occupational sorting. In the benchmark economy, agents whose entrepreneurial ability is higher tend to become entrepreneurs.

Resource misallocation

Resource misallocation is the first reason why government intervention is needed. In the benchmark economy, the investment (resource) in the economy is allocated to better entrepreneurs. However, in reality, this optimal allocation may not be achieved, due to some market frictions. As an example, I consider financial friction.

Suppose the maximum amount of borrowing is limited due to some fundamental friction in the financial market. For example, borrowers cannot commit to pay back lenders. This limited commitment

may limit the amount of borrowing. Specifically, I assume

$$k \leq \lambda A, \quad \lambda \geq 1, \tag{3}$$

where λ captures the extent of the borrowing limit. In the extreme, if $\lambda = 1$, agents cannot borrow and should use their own wealth for investment. Under this borrowing constraint, the optimal investment becomes $\hat{k}(\theta, A) = \min\{k^*(\theta), \lambda A\}$, and an agent becomes an entrepreneur if and only if $\theta \hat{k}(\theta, A)^\alpha - r\hat{k}(\theta, A) - \eta > w$. Unlike in the benchmark economy, agents' wealth plays a role in the decision to be an entrepreneur.

To illustrate how financial friction hinders the optimal allocation, suppose the agent with the best entrepreneurial ability has zero wealth. Due to financial friction, the agent cannot start a business and will become a worker. Even if an agent becomes an entrepreneur, the amount of investment may be limited due to financial friction. Under this circumstance, government intervention in the form of a loan subsidy can improve efficiency. By providing a loan to workers who could have become entrepreneurs without financial friction, those workers can start a business. Or, by providing a loan to entrepreneurs whose investment is limited due to financial friction, the constrained entrepreneurs can increase investment.

Positive externality

The investment by entrepreneurs may generate a positive externality. Suppose the social returns from investment by entrepreneurs is $\theta + s$ instead of θ. If s is positive, the socially optimal investment is greater than the realized investment by entrepreneurs: $\tilde{k}(\theta) = \left(\frac{\alpha(\theta + s)}{r}\right)^{\frac{1}{1-\alpha}} > k^*(\theta)$. When entrepreneurs only care about their private return (θ), the number of entrepreneurs and the investment by entrepreneurs will be smaller than the socially optimal one. In this case, a subsidy that promotes entrepreneurial investment can increase welfare.

Entrepreneurial human capital/productivity

In the benchmark model, the distribution of entrepreneurial ability is taken as given. However, one's individual ability as an entrepreneur (θ) may be endogenously determined by learning, and if this learning opportunity is limited due to a market friction (e.g., financial friction, informational friction), inefficiency may arise. In this case, helping to improve entrepreneurial ability or productivity can generate welfare gains.

Tax and default policy

Taxes in a society are inevitable, but they can create a distortion in entrepreneurial investment. When tax (τ) is imposed on the entrepreneurs' earnings, the profit in equation (1) changes to

$$y = \max_{k} \mathbb{E}[(1 - \tau)\{\theta k^{\alpha} - rk\}\epsilon] - \eta, \quad \alpha \in (0, 1). \tag{4}$$

As the tax increases, the marginal benefit from investment decreases. As a result, the marginal entrepreneur becomes a worker, and more importantly, all entrepreneurs reduce their investment.

Tax policies are often uncertain, and the tax-policy uncertainty can negatively affect entrepreneurship. For example, if the benchmark model is extended into a dynamic setup and the tax rate is a stochastic process, a higher variance of the tax rate will decrease startup formation.

Default policies can also affect entrepreneurship. Running a business is risky. More than 50% of new establishments disappear within five years of starting a business. Some countries exempt debts in the case of default (e.g., the US). The existence of debt forgiveness could be interpreted as reducing a fixed cost η for all entrepreneurs. On the other hand, lenders may not be able to collect money from borrowers, and hence cut their lending. In our model, the maximum funding limit will be reduced to $\lambda' A$, where $\lambda' < \lambda$.

3 Empirical findings

In this section, I summarize the empirical findings of entrepreneurship policies.

Who are entrepreneurs?

Before discussing an empirical validation of theoretical discussions, we need to specify entrepreneurs in the real world. Business owners or the self-employed are often considered entrepreneurs in empirical analyses. However, Hamilton [2000] shows most business owners enter and persist in business despite the fact that they have both lower initial earnings and lower earnings growth than in paid employment. His finding implies non-pecuniary benefits, rather than the desire to innovate, are the main reason most business owners start a business.

Schoar [2010] argues two types of entrepreneurs exist: subsistence and transformational entrepreneurs. The subsistence entrepreneurs are those who become entrepreneurs as a means of providing subsistence income, and the transformational entrepreneurs are those who aim to create large businesses that grow beyond the scope of an individual's subsistence needs. The behaviours of these two types of entrepreneurs are very different. For example, much more frequent transition is observed between the unemployed and the self-employed (who work for themselves) than between the self-employed and business owners who hire more than 10 employees. The transformational entrepreneurs, measured by business owners hiring more than a certain number of employees, are more in line with the entrepreneurs that economic theory envisioned. Related, Levine and Rubinstein [2017] disaggregate the self-employed into incorporated and unincorporated and argue the incorporated self-employed are more similar to entrepreneurs in economic theory.

Another way of measuring entrepreneurship is to use firm size or firm age. Small firms are once believed to create more jobs. Using the establishment level data from the U.S manufacturing sector, however, Haltiwanger et al. [2013] show that once firm age is controlled for, there is no systematic

relationship between firm size and growth. Their findings imply the job-creating prowess of small firms in the US is better attributed to startups and young firms that are small.

Although most business owners or the self-employed may be not the entrepreneurs whom Schumpeter described, some − especially, young-firm or startup owners who likely incorporate their businesses − may act as Schumpeter's innovators, and contribute to a significant amount of job creation in the economy.

Findings of resource misallocation

The empirical evidence on financial friction is mixed. On the one hand, many papers document empirical findings that support the existence of financial friction. Evans and Jovanovic [1989] show the propensity to become a business owner is a positive function of household or personal wealth. Other papers (e.g., Evans and Leighton [1989]; Holtz-Eakin et al. [1994]; Fairlie and Krashinsky [2012]; Sauer and Wilson [2016]) find a similar pattern. The positive relationship between wealth and the propensity to start a business may be prone to the endogeniety concern: An unobserved factor may exist that both affects wealth and the tendency toward business ownership. However, using the variation of housing price as an instrumental variable, other authors (e.g., Corradin and Popov [2015]; Adelino et al. [2015]; Schmalz et al. [2017]) draw the same conclusion.

On the other hand, other studies suggest financial constraints are not empirically important in deterring business formation. For example, Hurst and Lusardi [2004] document no relationship between household net worth and business entry over the majority of the wealth distribution, except for the very top. Using a localized housing-price variation, Kerr et al. [2015] argue housing collateral is not a major barrier to entrepreneurship. In a related view, Robb and Robinson [2014] show startup firms rely heavily on external debt for financing, which may suggest a well-functioning credit market for business creation.

The presence of venture capital (VC) may mitigate the financial friction for firms with high growth

potential. The VC is the professional asset-management entity that invests funds raised from institutional investors, or wealthy individuals, into promising new ventures with high growth potential (Da Rin et al. [2013]). Because the VC focuses on a small number of firms with high growth potential, the aggregate number of firms backed by VC is small. For example, using US Census data, Puri and Zarutskie [2012] find only 0.11% of new companies created over a 25-year sample period from 1981-2005 are funded by VC. Nevertheless, the aggregate impact of VC would be non-trivial. For example, Ritter [2011] documents that between 1980 and 2010, 35% of all US Initial Public Offerings (IPOs) were backed by VC. The literature indeed finds a causal impact of VC on firms' outcomes. For example, by controlling for a selection effect (productive firms are more likely to receive venture funding), Sørensen [2007] shows the value-adding effects of VC.[1]

Evidence for positive externality

Where does the positive externality (the positive s in section 2) come from? Localized increasing returns, known as agglomeration economies, could be one important source. Being located closely, entrepreneurs may share their inputs and reduce the production cost per unit. They may also easily find better workers. More importantly, they may be able to learn from other entrepreneurs, and increase productivity (Duranton and Puga [2004]). Given that these benefits from spatial concentration are not priced, one entrepreneur's investment may generate additional positive social returns.

Many empirical studies have documented evidence on the existence of the agglomeration economies.[2] For example, Ellison and Glaeser [1997] argue the agglomeration economies are important in explaining the geographic concentration pattern of US manufacturing industries. Holmes and Stevens [2002] show that plants located in areas where an industry concentrates are larger, on average, than plants in the same industry outside such areas, which may suggest production externality influences individual establishments. Faberman and Freedman [2016] estimate the urban-density premium for US establish-

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[1]For a survey of venture capital research, see Da Rin et al. [2013].

[2]For a survey of agglemeration economies, see Rosenthal and Strange [2004].

ments, and find the elasticity of average establishment earnings with respect to the metropolitan-area population is 0.03.

Another source of externality is related to the nature of entrepreneurial activities. An important aspect of entrepreneurial activity is innovation. Entrepreneurs develop new goods, provide new services, or create new markets. These types of activities, once executed, require no additional cost for others to replicate, and create positive externality. Previous studies document a positive association between a measure of entrepreneurship − either average firm size (Glaeser et al. [1992]), the proportion of startups (Audretsch and Keilbach [2004]), or the number of non-subsidiary firms (Rosenthal and Strange [2003]) − in a city and the city growth. This positive correlation may be due to an unobserved component that affects both entrepreneurship and the city growth. To handle this endogeneity issue, Glaeser et al. [2015] use proximity to historical mining deposits as an instrument for entrepreneurship in US cities. Coal mines near cities led to specialization in industries such as steel, with significant scale economies. Big firms in those industries subsequently dampened entrepreneurship across several generations. The result from their instrumental variable approach indicates a persistent link between entrepreneurship and city employment growth.

Focusing on innovation activities, Bloom et al. [2013b] show that technology spillovers are quantitatively important, and the gross social returns to R&D are at least twice as high as the private returns. Given the importance of innovation, many countries provide R&D grants to businesses. Lerner [2000] show the awardees for the Small Business Innovation Research (SBIR) program, the largest US initiative for innovation by small businesses, grew significantly faster than measurably similar firms over a decade and were more likely to attract venture financing. Howell [2017] estimates the effectiveness of R&D subsidies by using data on ranked applicants to the SBIR program. By comparing applicants just below and above the acceptance cutoff, she finds an early-stage award approximately doubles the probability that a firm receives subsequent venture capital, and has large, positive impacts on patenting and revenue. These effects are stronger for more financially constrained firms, suggesting

the grants are useful because they fund technology prototyping. Gruber and Johnson [2019] argue a rapid economic growth in the US after World War II was driven by partnership between the private sector, the federal government, and universities that internalized positive externality from innovation.

Findings of entrepreneurial human capital

The most influential paper about entrepreneurial human capital may be Lazear [2004]. He argues that entrepreneurs must have a balanced set of skills. Entrepreneurs perform a variety of tasks. They do not need to be an expert in one area, but they need to understand many tasks in order to hire someone to perform the tasks. As a result, those who end up being entrepreneurs will accumulate more "balaned" human capital than those who end up working for others.

Lazear [2004] test this prediction by using Stanford MBA students. Wagner [2003] tests and confirm Lazear's prediction by using German micro data. On the other hand, Silva [2007] argues the balanced skills for entrepreneurship are mostly given characteristics, rather than developed characteristics, using a panel regression with an individual fixed effect. Related, Aldén et al. [2017] construct a measure of balanced (given) ability by using Swedish military enlistment data, and show the likelihood of being self-employed is higher for individuals whose skills are balanced.

Although Lazear's theory and subsequent empirical evidence show the balanced skill, rather than a specialized one, is important for entrepreneurs, whether such entrepreneurial skill can be developed, and if so, under what circumstances, is relatively lesser known. Lindquist et al. [2015] show one's family environment is important for becoming a business owner. Using Swedish adoption data that features both biological parents, and adoptive parents, information, they show that post-birth factors account for twice as much as pre-birth factors in explaining the intergenerational association in entrepreneurship. They argue children's modeling is the main reason behind this finding. Guiso et al. [2015] document that individuals who grew up in areas with a high density of firms are more likely, as adults, to become entrepreneurs, controlling for the density of firms in their current location.

They argue this finding is consistent with entrepreneurial capabilities being learnable through social contacts.

On the other hand, by exploiting China's planned economic era in which private economic activity (and hence business ownership) was prohibited by law, Li and Goetz [2019] show children whose parents were self-employed before China's socialist transformation were more likely to become self-employed after the economic reform, even though they had no direct exposure to their parents' businesses. Their findings suggest the inherited traits are important for entrepreneurship.

Related, a recent paper by Bell et al. [2018] investigates whether one's ability as an inventor can be nurtured. Using data on 1.2 million inventors from patent records linked to tax records in the US, they show the exposure to innovation during childhood has significant causal effects on children's propensities to invent. In particular, children who grow up in a neighborhood or family with a high innovation rate in a specific technology class are more likely to patent in the same class. Similarly, girls are more likely to invent in a particular class if they grow up in an area with more women (but not men) who invent in that class.

Several studies emphasise management practice as an important factor for a firm's productivity. Bloom et al. [2013a] run a randomized control trial among Indian textile firms in which they provide a management consulting service to randomly selected firms. They find that adopting suggested management practices raised productivity by 17% in the first year through improved quality and efficiency and reduced inventory, and within three years led to the opening of more production plants. They argue information friction is the main reason why some plants do not adopt more efficient management practices. Bloom et al. [2018] follow up on those Indian textile firms after about 10 years after the first intervention. They find that although about half of the practices adopted in the original experimental plants had been dropped, a large and significant gap was still present in practices between the treatment and control plants, suggesting lasting impacts of effective management interventions.

Brooks et al. [2018] assigned experienced mentors to randomly selected Kenyan female microen-

terprise owners. Mentorship increases profits by 20% on average, with initially large effects that fade as matches dissolve, whereas a formal business-education intervention has no effect on profits despite changes in business practice. They argue the localized, specific knowledge of mentors increases profit, whereas abstract, general information from the class does not. Lafortune et al. [2018] conducted a randomized experiment in Chile in which they randomly assigned a successful alumnus of a micro-entrepreneurs education program for the incoming batch of the program. They find a visit from a successful alumnus of the program increased household income one year after, mostly due to increased business participation and business income. They argue role-modeling is the main reason behind this effect. Cai and Szeidl [2017] randomized 2,820 firms into small groups whose managers held monthly meetings for one year, and into a "no-meetings" control group. They find the meetings increased firm revenue by 8.1%, and also significantly increased productivity of the firm even one year after the conclusion of the meetings. They also find managers shared business-relevant information, particularly when they were not competitors, showing the meetings facilitated learning from peers.

Most papers on management practice are based on research on developing countries. Bloom et al. [2019] show that a large amount of heterogeneity on management practice exists among US establishments even within the same firm, and this variation accounts for about a fifth of the spread of productivity. They find causal evidence that regulation of the business environment (as measured by the Right-to-Work laws) and learning spillovers − measured by the arrival of large new entrants in the county − improve management practice.

The impact of tax and default policy

Numerous studies have documented that higher corporate tax rates are more likely to impede business activities. Using data on French plants, Rathelot and Sillard [2008] find a higher local corporate tax deters new-firm formation. Duranton et al. [2011] also find a negative impact of local taxation on employment growth, but not on firm entry, using establishment data in the UK. Rohlin et al. [2014]

find the impact of taxes on business creation around the state borders differs depending on reciprocal agreements that require workers to pay income tax to their state of residence rather than their state of employment. Using US Census micro-data on multi-state firms, Giroud and Rauh [2019] show a negative impact of state taxes on the number of establishments in the state. They also show that reallocation of productive resources to other states drives half the effect. Regarding tax uncertainty, Lee and Xu [2019] show that as tax policies become more uncertain, business creation tends to decrease.

The severity of bankruptcy laws regarding the forgiveness of debts varies across countries. For example, the US provides a chance for bankruptcy filers to be discharged from pre-bankruptcy indebtedness, whereas European countries such as Germany tend to be strict on the debt forgiveness. Armour and Cumming [2008] document the relationship between the extent of debt forgiveness and self-employment across countries. They find a country with a more "forgiving" bankruptcy law tends to have a higher self-employment rate.

In the US, some individuals are eligible to file for bankruptcy under Chapter 7. Chapter 7 requires debtors to pay back loans using all assets above the exemption levels, but does not require them to use future earnings toward past debts. Variation exists across states and over time in the types of exemptions, such as equity in the individual's primary owner-occupied housing unit (homestead exemption), cars, cash, furniture, and clothing, as well as variation in the amount protected under each exemption. Rohlin and Ross [2016] use this variation to quantify the impact of bankruptcy law on business creation. They find that an increase in the homestead exemption attracts new businesses but also has a positive impact on existing businesses, suggesting that asset protection through bankruptcy law encourages successful entrepreneurs to incur the risks.

A more lenient bankruptcy law provides a higher incentive for individuals to start a business. However, facing a higher default risk, lenders will charge a higher interest rate or implement a lower borrowing limit as mentioned earlier. Several studies investigate this general equilibrium consequence of the severity of bankruptcy law by using a quantitative dynamic general equilibrium model (e.g.,

Athreya [2002]; Livshits et al. [2007]; Chatterjee et al. [2007]; Akyol and Athreya [2011]). A consensus of this line of research is that the relationship between the extent of debt forgiveness and welfare (or entrepreneurship) of an economy is highly non-linear, suggesting taking into account the general equilibrium effect is important for a bankruptcy policy discussion.

4   Entrepreneurial activities and government policies in Singapore

In this section, I discuss the current status of business dynamism in Singapore and summarize policies currently implemented by Singapore's government.

4.1   The current status

The Accounting and Corporate Regulatory Authority in Singapore publishes the number of new and exiting business entities in each month since January 1970. It reports the aggregate number as well as the number for the following 14 industries: (1) Manufacturing, (2) Construction, (3) Wholesale trade, (4) Retail trade, (5) Transportation, Storage, (6) Accommodation, (7) Food service, (8) Info., Communication, (9) Finance, Insurance, (10) Real estate, (11) Professional, Scientific, (12) Administration, (13) Education, Health, and (14) Art, Entertainment. Assuming the number of business entities in December 1969 is zero, I calculate the aggregate number of business entities, and report the number since 1990.

Figure 1 shows the result. The number of business entities in Singapore has more than doubled since 1990. Figure 2 depicts the growth rate of the number of business entities since 1990. A steady growth rate is observed except in 2005 and 2016. In Figure 3, I plot the total number of new/exiting business entities in each year. The figure shows a steady increase in both numbers. A particularly high exit is observed in 2005 and in 2016. Figure 4 shows the total number of new/exiting business entities in each industry. The number of manufacturing business entities has been stable over the last

30 years, whereas the number of business entities in service industries has steadily increased.

Figure 5 shows the composition of business entities in each industry since 1990. First, the share of manufacturing, construction, and wholesale/retail trades has decreased over the last 30 years. On the other hand, the share of information/communication, finance/insurance, professional/scientific, and education/health has increased. A surge of transportation/storage in recent years is also observed, possibly due to a rise in the hailing service industry such as Grab. Overall, the Singapore economy has experienced a structural transformation from a manufacturing-based economy to a service-based economy.

Next, I show the proportion of new/exiting business entities since 1990. Figure 6 shows the result. The proportion of both new and exiting business entities has been stable over the last 30 years. I also show the proportion of new/exiting establishments for the rising industries[3] and other industries. The two types of industries both show a stable path, and the rising industries are driven by new entries.

In the US, both the job-creation and -destruction rate have been declining over the past 30 years, suggesting declining business dynamism (Decker et al. [2014]). This secular decline of business dynamism in the US has attracted much attention from economists due to its close linkage with entrepreneurship. Unlike the case in the US, business dynamism in Singapore seems to be relatively strong, as shown in Figure 6.

The private equity (PE) and VC industry is rapidly growing in Southeast Asia, especially in Singapore. The total value of PE/VC investments in Southeast Asia has grown about four times in recent years (from about 6 billion USD in 2015 to 24 billion USD in 2017). The investment in Singapore consists of the largest share (about 75%) of total PE/VC investments in Southeast Asia. Other than specialized VC funds, large corporations as well as Singapore's government also invest a substantial amount of funds in startup companies in Singapore.[4]

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[3]Those industries include Information/communication, finance/insurance, professional/scientific, and education/health, and transportation/storage.

[4]The statistics about PE and VC are from the Singapore Venture Capital & Private Equity Association. For more information, visit its website (https://www.svca.org.sg/publications).

4.2   Entrepreneurship policies in Singapore

Singapore's government (SG gov.) has implemented a variety of policies for improving entrepreneurship. I summarize some of those policies based on the theoretical discussion in section 2.[5]

Improving resource allocation

To mitigate financial friction, SG gov. provides a variety of financial support to small business or startup firms. The outstanding loans for Small/Medium Entreprises (SMEs) in 2017 was S$940 millon, which is about 0.3% of Singapore GDP. Many loan programs, such as SME Micro Loan, SME Working Capital Loan, and Local Enterprise Finance Scheme, are provided for small business owners.

Internalizing positive externality

To promote R&D and innovation, SG gov. provides several grants programs. For example, R&D grants for breakthrough levels of scientific innovation are provided under the Startup SG Tech program. Several government programs, such as Pioneer Certificate Incentive, Development and Expansion Incentive, Finance and Treasury Centre Incentive, and Productivity and Innovation Credit Scheme, provide tax incentives for firms whose activities significantly contribute to Singapore's economy through the advancement of technology, skillsets, or knowhow.

At a broader level, government agencies such as the National Research Foundation (NRF) and the Agency for Science, Technology and Research (A*STAR) devise and implement nationwide strategies to improve research and innovation in Singapore (e.g., collaboration with universities or private companies in targeted research areas).

In addition, recognizing the importance of agglomeration economies on startup development, SG gov. developed a 6.5-hectare site, located within one-north, to provide a working space for more than

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[5]Facts summarized in this section are from government websites such as Enterprise Singapore (https://www.enterprisesg.gov.sg/), National Research Foundation Singapore (https://www.nrf.gov.sg/) and Agency for Science, Technology and Research (https://www.a-star.edu.sg/).

100 startups, VC firms, and tech incubators.

Improving productivity/entrepreneurial skill

To improve firms' productivity and management practice, SG gov. has implemented several programs. The Startup SG Founder program encourages the interaction between entrepreneurs by setting up mentorship for first-time entrepreneurs with innovative business ideas, and the Angel Investors Tax Deduction program provides a tax deduction for startup investment. The Productivity Solution Grant provides incentives for firms adopting IT solutions and long-term technology investments. Centres of Innovation provides consulting and training services for SMEs to improve their technology. To improve workers' productivity, SG gov. provides many work-study programs under SkillsFuture scheme.

Tax and default policy

Corporate tax in Singapore has reduced significantly over the last 40 years, and the current tax rate is significantly lower than the world average. Figure 7 compares Singapore's corporate tax rate with the average corporate tax rates across the world between 1980 and 2019.[6] Singapore's corporate tax rate has decreased from 40% to 17%, and the extent of the tax-rate reduction is substantial compared to the world average.

Bankruptcy law in Singapore allows either a debtor or the debtor's creditor to file for bankruptcy.[7] If bankruptcy is declared, the debtor's assets will be sold to be distributed to the creditors, excluding assets that are protected from bankruptcy, such as HDB flats. Bankrupts who are employed will have to make a monthly contribution toward fulfilling target. If the target contribution is paid off, the bankrupt can be discharged from bankruptcy. Compared to the US, where individuals may not be required to use future earnings to pay past debts, and hence be given a "fresh start" after bankruptcy, the extent of debt forgiveness seems to be low in Singapore.

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[6]Source: Tax Foundation (www.taxfoundation.org)
[7]Source: Singapore Legal Advice (https://singaporelegaladvice.com/law-articles/filing-for-bankruptcy-singapore)

5   Discussion

I have discussed four reasons why government intervention is relevant for boosting entrepreneurship: (1) resource misallocation, (2) positive externality, (3) entrepreneurial human capital, and (4) tax and default policies. After discussing empirical findings in the economics literature, I summarized government policies in Singapore for boosting entrepreneurship and innovation.

Going forward, focusing on internalizing positive externality and improving entrepreneurial human capital seem to generate the highest payoff for Singapore's economy. First, growing industries such as e-commerce, fintech, and artificial intelligence (that would likely generate greater value in Singapore) require better ideas. To develop the petroleum industry in a nation, for example, investing in a large amount of physical capital would be prioritized rather than investing in human capital. Although physical capital is mandatory for a firm's growth in the later stage, the core idea or business plan is what differentiates a great firm from others in high-tech industries. Moreover, given the growing PE/VC investments in Singapore, a private entity would finance the later-stage capital as long as a firm shows a high growth potential. On the other hand, the supply of great ideas and innovation can be limited due to market failures, which is where SG gov. should step in.

SG gov. seems to be headed in the right direction in boosting entrepreneurship and innovation. A recent development of a startup hub seems to be a great government investment, and SG gov. continues to focus on fostering new technologies, as reflected in Singapore Budget Speech in 2018. On top of the current policy schemes, addressing the following two areas can be potentially beneficial.

First, given that high-potential startup firms can generate synergy (or positive externality) with local firms and create more local employment, SG gov. might want to work on attracting high-potential startups regardless of their nationality. Singapore has a comparative advantage in infrastructure and location over other Southeast countries to attract those high-potential startup firms. For example, Singapore is an English-speaking country and is open to multinational culture. The country has

subsidiaries of many multinational firms and an advanced financial sector. The growing startup scene in Singapore also provides high-skilled workers. SG gov. already implemented some policies to attract foreign startup firms, such as providing special VISAs for eligible foreign entrepreneurs. Pushing further in this direction would generate a high value for Singapore's economy.

Second, SG gov. may need to consider providing more "fresh starts" for failed entrepreneurs by allowing more debt forgiveness. Entrepreneurship is risky by nature. Some failures may be due to a lack of entrepreneurial ability, but some are due to a bad luck. Providing a second chance for a highly able entrepreneur hit by a bad shock could improve efficiency. Increasing the extent of debt forgiveness could generate other side effects as discussed in section 3. More discussion and research are required to devise laws that provide more chances to highly productive, unlucky entrepreneurs.

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Figures

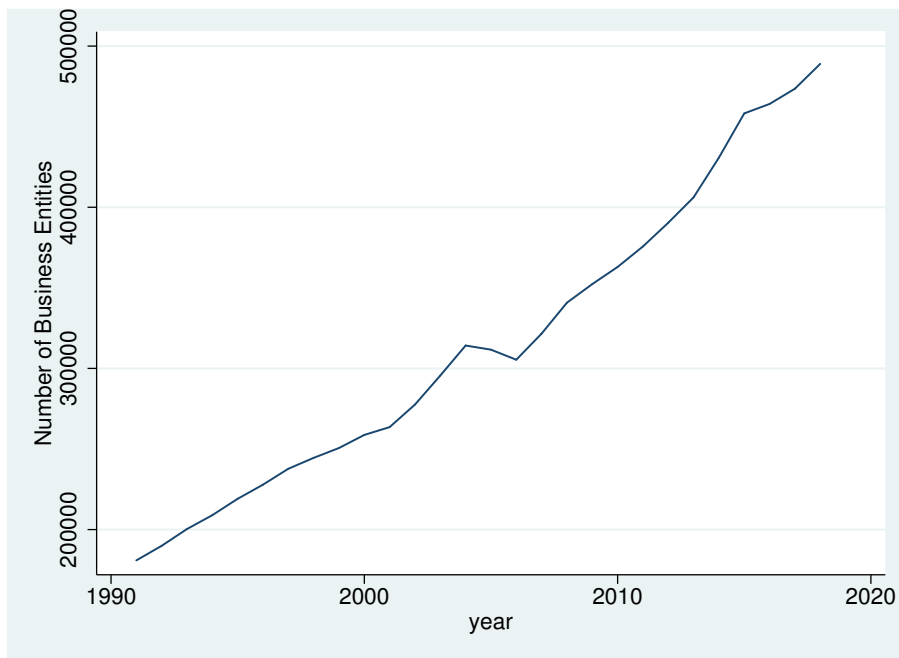Figure 1: The Number of Business Entities in Singapore

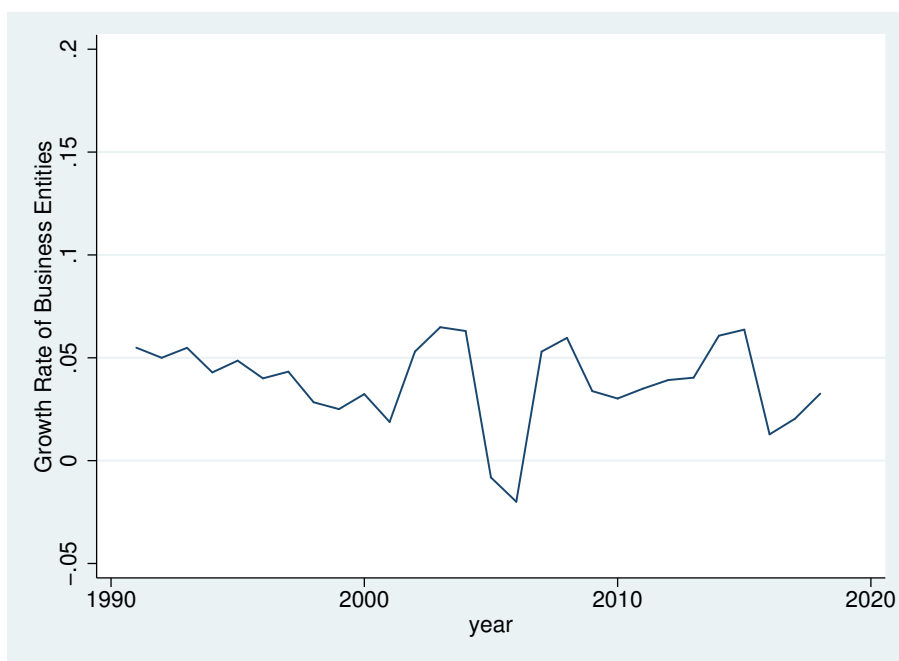Figure 2: The Growth Rate of Business Entities in Singapore

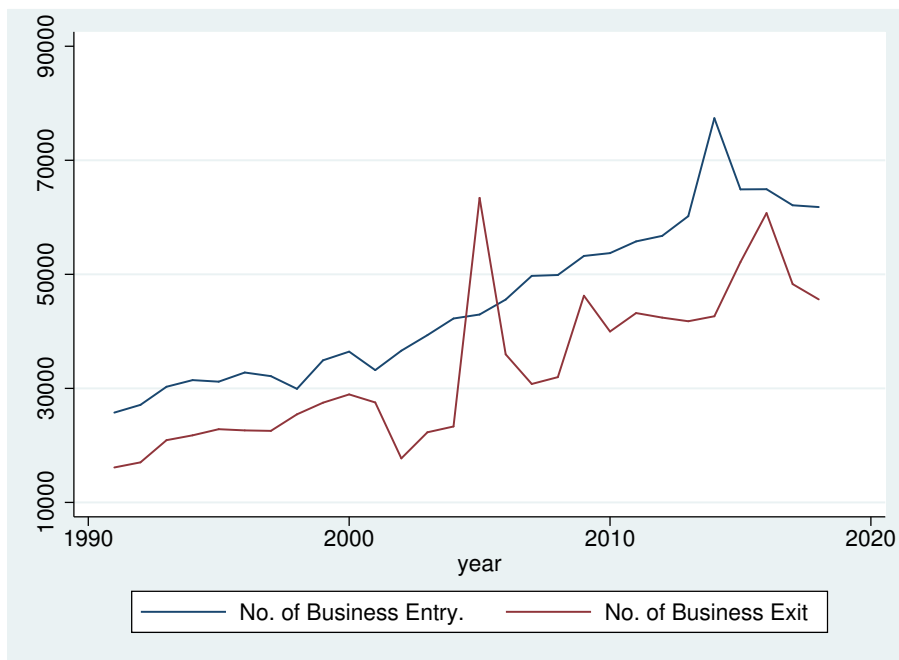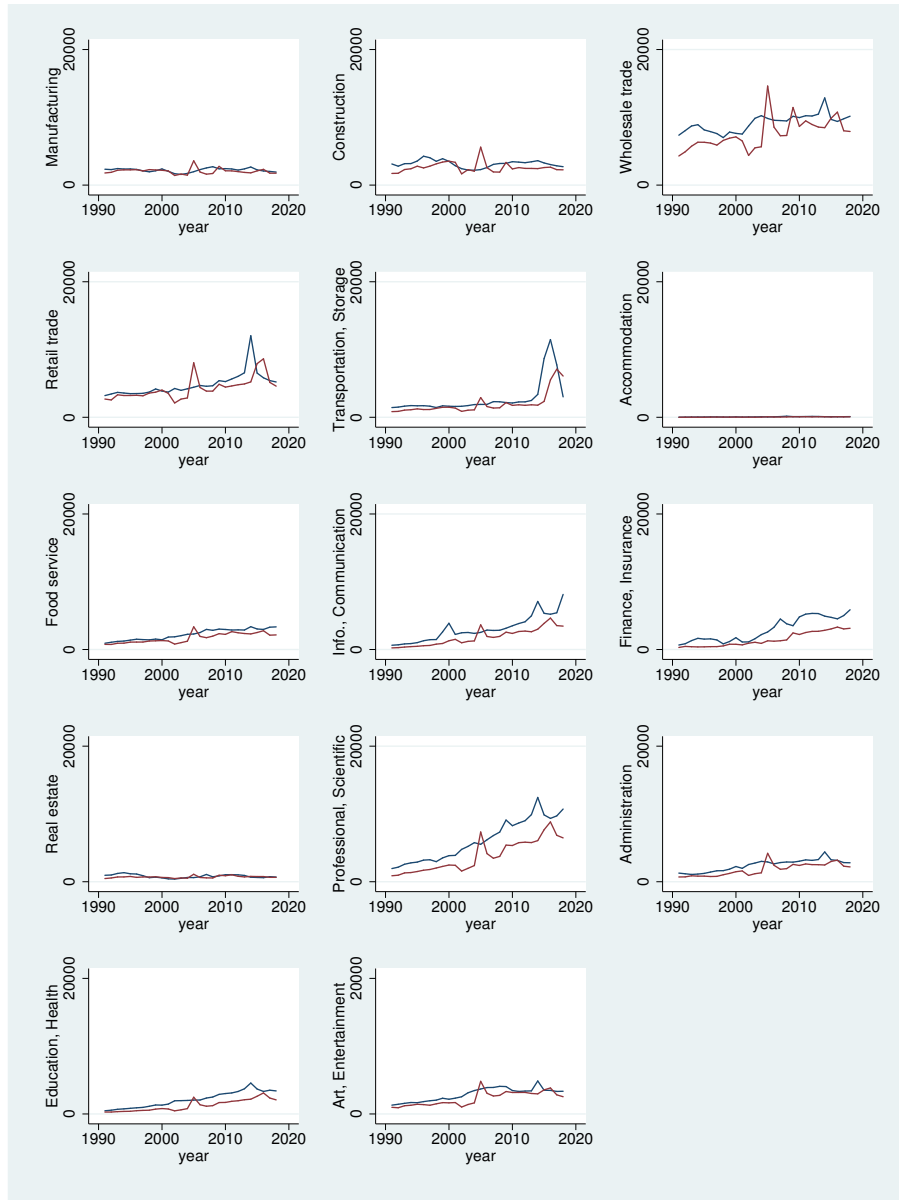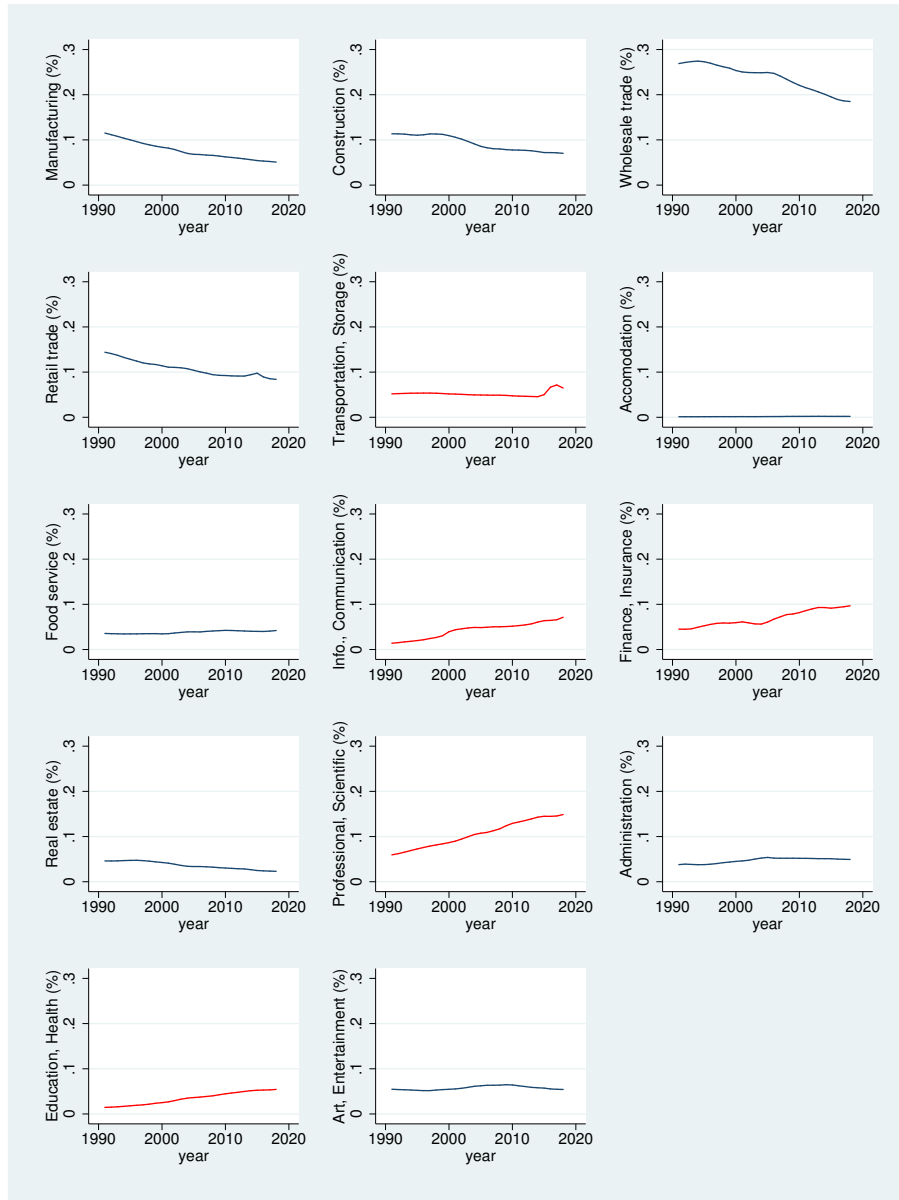Figure 3: The Number of New/Exiting Business Entities in Singapore

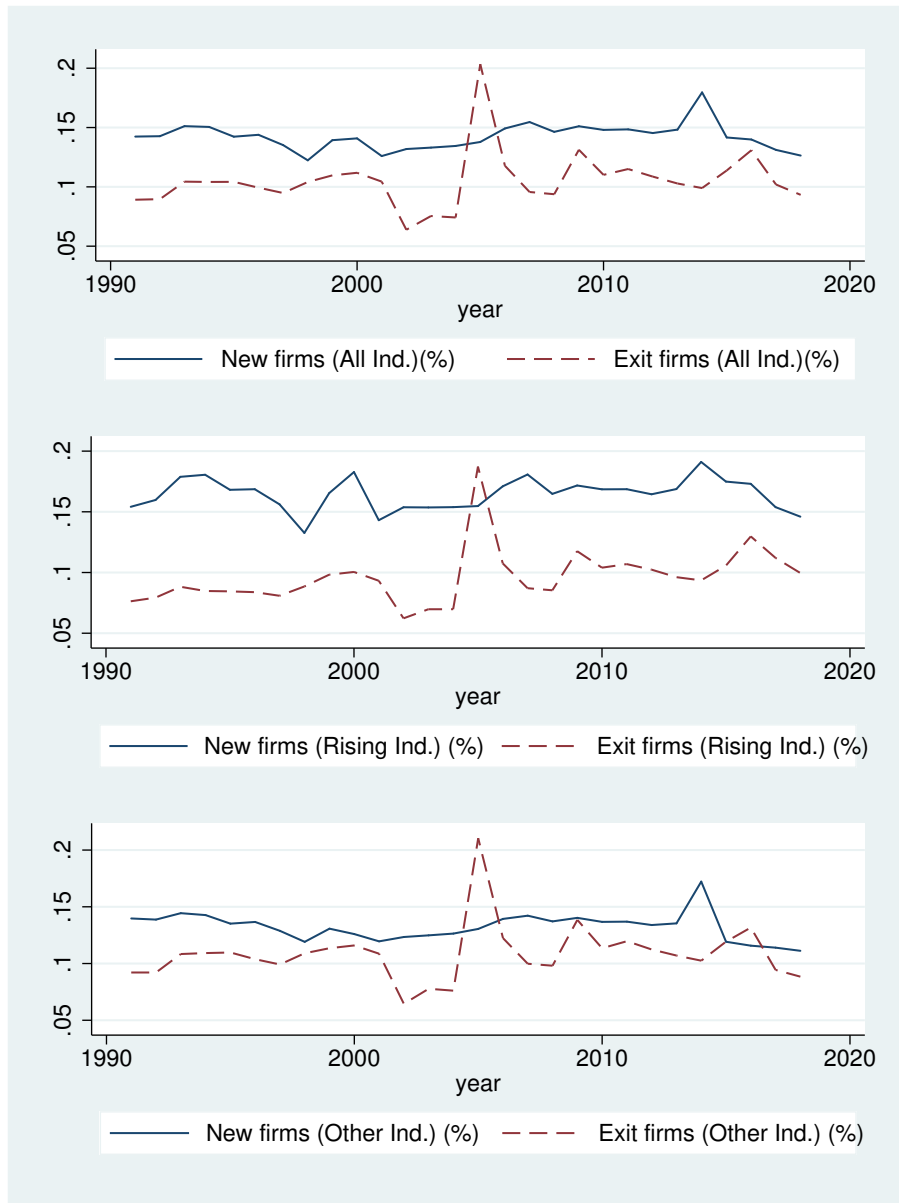Figure 4: The Number of New/Exiting Business Entities in Singapore (Each Industry)

NOTE: The blue and red line indicate the number of entries and exits, respectively.

Figure 5: Industry Composition among Business Entities in Singapore

NOTE: Growing industries are highlighted by red lines.

Figure 6: Business Dynamics in Singapore

NOTE: Rising industries include information/communication, finance/insurance, professional/scientific, and education/health, and transportation/storage.

Figure 7: Corporate Tax Rates in Singapore vs. World Average