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**Regional Deregulation and  
Entrepreneurial Growth in China's Transition Economy**

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## **Regional Deregulation and Entrepreneurial Growth in China's Transition Economy**

### **ABSTRACT**

Despite a less favorable national institutional environment, the private entrepreneurial sector has developed rapidly in China's transition economy. To resolve this puzzle, this study argues that regional deregulation plays a significant role in China's entrepreneurial growth because it stimulates free markets and lifts predatory and discriminatory regulatory policies affecting entrepreneurship. I use provincial-level panel data (1998-2003) for hypothesis testing. The results, based on fixed effects estimation, suggest that deregulation indeed has a significantly positive effect on entrepreneurial growth within regions. In addition, this effect is found to be stronger in earlier years, as well as among less developed, inland regions.

*Key words:* entrepreneurship, institutional environment, regional deregulation, China

## 1. INTRODUCTION

China's transition from state socialism to a market economy since 1978 has not only pulled hundreds of millions of people out of poverty, but also generated an average 9 % GDP growth rate in the past three decades. Experiences from many other countries suggest that entrepreneurship has a significant impact on economic development (e.g., Jackson, Klich, and Poznanska 1999; Martinez 2005; Pisani and Pagan 2004). This is also the case in China. Although the private entrepreneurial sector did not even exist before the market transition, and has attracted little attention until very recently, it has grown rapidly and also contributed significantly to the recent economic miracle in China, especially since the mid 1990s.

The private entrepreneurial sector includes two types of domestic private firms – non-farm private enterprises (*siying qiye*) and individual enterprises (*getihu*), both of which are owned by individuals and, thus, entrepreneurial firms.<sup>1</sup> Figure 1 shows growth of private and individual enterprises in terms of total registered capital (which is equivalent to ownership equity) since 1989, when the data were first available. This figure indicates that both types of private firms grew steadily from 1989 to 2002. In particular, private enterprises, which were larger and more influential than individual enterprises, experienced explosive growth since the late 1990s with total registered capital reaching 2475.6 billion Chinese Yuan (in nominal terms, this is approximately equal to 310 billion US Dollars or 24 % of China's GDP) in 2002. With such a rapid growth rate, by the end of the 1990s, this sector already accounted for one-third of national industrial output and one-fifth of national non-farm employment (International Finance

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<sup>1</sup> The difference between private enterprises and individual enterprises is in number of employees: A private business is a private enterprise if it has at least eight employees, an individual enterprise if less than eight employees. In this paper, I used "private firm" to indicate both types.

Corporation (IFC) 2000). By 2004, its contribution to national GDP had surpassed 50 % (Zhou 2009).

[Figure 1 inserted about here]

This rapid entrepreneurial growth, as well as its rapidly increasing contribution to the economy, is puzzling. It is generally accepted that, unlike Eastern Europe and the former Soviet Union states, the Chinese state did not have any government programs to deliberately develop its domestic private sector (e.g., IFC 2000; McMillan and Woodruff 2002; Tsang 1996; Zhou 2009). And, in general, the national institutional environment was not conducive to the private sector, even by the early 2000s.

Prior research has emphasized the significance of informal institutional arrangements in entrepreneurial development in transition economies, including China. Entrepreneurs have been found to adopt a wide range of informal institutional arrangements, such as social ties (e.g., Aidis, Estrin, and Mickiewicz 2008; Batjargal 2010; Manolova and Yan 2002; Tan, Yang, and Veliyath 2008; Xin and Pearce 1996; Zhao, Frese, and Giardini 2010), social norms (Peng 2004), and political capital (e.g., Nee 1992; Wu 2006; Zhou 2009). However, although such informal arrangements may help entrepreneurs mobilize resources and adapt to a hostile institutional environment, entrepreneurship will be restricted and even unproductive, and its contribution to job creation, innovation, and economic development will be limited when the formal institutional environment is deficient and not conducive (Baumol 1990; also see Sobel 2008).

This study argues for the significance of regional deregulation in China's rapid entrepreneurial growth. Regional deregulation was partly a result of regional experimentation

and imitation of various regulatory models under “federalism, Chinese style” (Blanchard and Shleifer 2005; Montinola, Qian and Weingast 1995). It removes the high regulatory constraints faced by entrepreneurs and stimulates market allocation for resources, thus facilitating entrepreneurial growth.

## **2. THE NATIONAL INSTITUTIONAL ENVIRONMENT**

As in other socialist planned economies, the economic structure in China before the reform was dominated by large State-Owned Enterprises (SOEs) in heavy industry, and private entrepreneurship was legally forbidden (Naughton 2007). The private entrepreneurial sector was allowed to reemerge in China during the early reform period for very pragmatic reasons. After thirty years (1949 – 1978) of a socialist planned economy, China encountered severe shortages of consumer goods and services, low morale in factories and on collective farms, and a high real urban unemployment rate by the late 1970s (Naughton 2007). To alleviate these long-lasting problems, the central reformers allowed peasants, as well as unemployed urban citizens, to establish family or individually owned small businesses to produce consumer goods and services (Zhou 2009). Thus, many private firms got started.

However, initially, the emergence of the private sector invited harsh critiques from ideologically conservative forces. And, although the central reformers welcomed the emergence of private firms, they did not want to openly challenge socialist ideology, for fear of losing their political legitimacy. As a compromise, private firms were restricted to playing a marginal, stop-gap role in the economy in the first decade of the reform (IFC 2000). Regulatory restrictions included the following, among many others: A private firm could employ only up to seven employees; it could enter only a small number of industries that produced consumer goods and

services; it could not obtain factor resources such as bank credits directly from state-owned institutions (IFC 2000; Tsai 2002; Zhou 2009).

Since 1988, and particularly following Deng Xiaoping's Southern Tour in 1992, after which the Chinese Communist Party (CCP) acknowledged that the Chinese economy was a socialist market economy, a more pragmatic approach to the private sector has been adopted, under which some previous regulatory restrictions, such as the limit on firm size, have been lifted, and many others have been loosened (Naughton 2007). In 1997, the 15<sup>th</sup> Party Congress of the CCP formally removed ideological discrimination against private entrepreneurship by announcing that the private sector would be considered equally important as the public sector in the economy (Atherton 2008; Huang 2005). In 2001, as a political gesture to further legitimize private entrepreneurship, President Jiang Zemin published his Three Represents Theory, which called for allowing private entrepreneurs to join the CCP (Zhou 2009). Such ideological and regulatory changes not only eased the entry of entrepreneurship but also created a much welcome scope for regional/local governments to facilitate regulatory changes that were conducive to entrepreneurship in the late 1990s and early 2000s as will be discussed in the next Section.<sup>2</sup>

Nevertheless, although the Chinese government removed a number of restrictions on entrepreneurship, it did not work proactively to establish a favorable institutional framework for healthy growth of private entrepreneurship throughout the 1990s and early 2000s (e.g., IFC 2000; Naughton 2007; Zhou 2009). Instead, a number of institutional problems faced by private entrepreneurs in the 1980s have remained largely untouched.<sup>3</sup>

One of the most severe institutional constraints, regulatory discrimination against private entrepreneurship, has been sustained because of the central government's emphasis on state

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<sup>2</sup> I am indebted to one of the reviewers for this point.

<sup>3</sup> Some scholars have even argued that the institutional environment for entrepreneurship in the 1990s and early 2000s was even worse than that in the 1980s (see, e.g., Huang 2008).

ownership (Naughton, 2007). One notable type of discrimination is entry barriers to many industries. Even by 2009, private firms were still allowed to enter only 41 out of more than 80 total industries in China (*Xinhua News* 30 December 2009). In addition, private firms had difficulty obtaining a variety of critical resources, because most resources were still controlled by the state, which distributed them more on the basis of political rather than economic considerations (Zhou 2009). Even by the mid-2000s, politically legitimate firms (e.g., SOEs) enjoyed preferential treatment while private firms were discriminated against in getting access to government-controlled resources, such as bank financing (Huang 2007; Zhou 2009).

A second institutional constraint was government predation. Because there was no rule of law in China, government officials were empowered to impose a variety of predatory regulations on business (Frye and Shleifer 1997). As a result, entrepreneurs usually needed to make extralegal payments to a number of government offices and wait for lengthy periods in order to obtain government services and business licenses. And, local authorities in many regions often engaged in charging extralegal taxes, levies, and fees on private firms in the name of better serving and managing private businesses (Huang 2005).

In addition, Chinese entrepreneurs encountered insecure property and contractual rights. New institutional scholars have long argued that credible commitment by the state to protect private property and contractual rights is necessary for entrepreneurial investment (North, 1990). The Chinese government, however, did not provide substantive legal protection for or enforcement of private property and contractual rights, which were written into the Chinese Constitution only in 2004 (Atherton, 2008; IFC 2000; Zhou 2009). Thus, many government officials were often engaged in harassing private entrepreneurs through expropriation and extortion, or permitted such harassment by others (Zhang and Ming 1999). And, private firms



were often discriminated against openly by the courts, which were not independent, but under the tight control of the CCP, in lawsuits on contractual disputes, especially when such disputes were with SOEs or even foreign firms. As a result, many entrepreneurs went bankrupt, since they accepted orders that were never paid for, and the courts did not stand up for their rights (IFC 2000).

Since the early 2000s, and especially the mid 2000s, the central government has begun to revamp the regulatory and legal environment for private entrepreneurship in order to facilitate entrepreneurial growth. However, such regulatory and legal changes were introduced only after the private sector has already become a major contributor to the Chinese economy (Zhou 2009). One significant policy change introduced in the early 2000s was the promulgation of the 2003 Small and Medium Enterprises (SME) Promotion Law, which, for the first time, required the government to develop support systems that provide SME with resources and input needed to start and grow their ventures (Atherton 2008). In 2004, the central government introduced an amendment into the Chinese Constitution to protect private property rights (Zhou 2009). In January 2005, the central government promulgated a regulation – “Thirty-six Principles on the Non-public Economy” – to seriously tackle the problems of government predation of and discrimination against private firms (Huang 2007). These key principles included lifting prohibitions for entry into certain industries, and easing access to finance for private firms. That is, private firms were officially allowed to enter any industry except for those related to national security, or specifically prohibited, and state-owned financial institutions were required to treat private firms equally in loan decisions.

### **3. FEDERALISM AND REGIONAL DEREGULATION**

Section 2 suggests that, contrary to some prior research (e.g., Huang 2008), the central government played a positive role in China's entrepreneurial growth by removing a number of key ideological and regulatory restrictions on entrepreneurship. However, it is also noted that the central government failed to provide the national institutional environment needed for healthy entrepreneurial growth throughout the 1990s and early 2000s. If such is the case, how do we make sense of the rapid growth of private firms, as shown in Figure 1? This study argues that the regional deregulation that has swept throughout China since the mid 1990s has played a significantly positive role in rapid entrepreneurial growth.

### ***3.1 Definition of Deregulation***

Broadly defined, deregulation consists of two elements (Storey 1994; see also Verheul, Wennekers, Audretsch, and Thurik 2001): the first refers to stimulating free markets; the second, lifting administrative and legislative burdens (especially, predatory, and discriminatory regulations) that take time, energy, and resources away from fundamental entrepreneurial activity. Most existing empirical studies have emphasized the second element, because they tend to be focused on market-developed economies (World Bank 2005). For example, the *ease of doing business index* created by Djankov, McLiesh, and Ramalho (2004), which is a composite index measuring both deregulation and protection of property and contractual rights, includes five sub-indices – (1) starting a business, (2) hiring and firing workers, (3) registering property, (4) obtaining credit, and (5) closing a business, which clearly measure only the second element of deregulation.<sup>4</sup>

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<sup>4</sup> The other two sub-indices are protecting investors and enforcing contracts, which measure protection of property and contractual rights.

In a transition economy like China's, given the existence of predatory and discriminatory regulatory policies, which often take time, energy, and resources away from fundamental entrepreneurial activity, the second element (i.e., lifting predatory and discriminatory regulatory policies) is clearly important for entrepreneurial development. Yet, because the government still controls most key economic resources, and a market economy has yet to develop out of China's transition economy, stimulating free markets – the first element – is also necessary for entrepreneurial development. In particular, developing markets for crucial factor resources, such as credit and labor, is especially important for entrepreneurial development, because entrepreneurs have difficulties obtaining these resources in China's transition economy (IFC 2000; Tsai 2002; Zhou 2009).

### ***3.2 Regional Experimentation and Deregulation in China***

The Chinese central reformers began to transfer government authority from central to regional and local levels in 1979 in order to enjoin government officials at the regional and local levels to support profitable economic development (Naughton 2007). After the decentralization reform, regional and local governments became regulators of their economies. They could issue business licenses, coordinate local business development, resolve business disputes, and enact tax policies. They also acquired the authority to determine the structure of local expenditure, which was linked to the revenues generated in the region (Qian 2000). As a result, since then, although remaining *de jure* a unitary state, China has in many ways functioned as a *de facto* market-preserving federalist state (Blanchard and Shleifer 2005; Montinola, Qian, and Weingast 1995).

A market-preserving federalist structure is argued to have an advantage in facilitating regional experimentation in terms of regulatory policies and imitation of successful ones

(Blanchard and Shleifer 2005; Montinola, Qian, and Weingast 1995). Because government expenditure has been linked to revenue generated, regional/local bureaucrats had incentives to promote economic development in order to increase regional revenue. In China, given the impossibility of planning for economic reform *ex ante*, as it was complex in nature and had no historical precedence, regional/local bureaucrats had to experiment with whatever regulatory policies were considered most appropriate for their own region, or imitate successful policies in other regions. A number of successful regulatory models were thus attempted (Chow 2002). The two most notable ones, i.e., the Southern Jiangsu model and Zhejiang model, resembled the developmental state model and the liberal state model, respectively. These were widely emulated by other regions in different time periods and triggered waves of regional regulatory changes across China.

The Southern Jiangsu model – a variant of the developmental state model – originated in Jiangsu province in the early 1980s and prospered until the mid 1990s (Chow 2002). Under this model, private entrepreneurship was severely restricted, and firms owned by local governments (particularly, Township and Village-owned Enterprises or TVEs) were offered favorable government treatment, particularly in obtaining bank loans (Nee 1992). As a result, TVEs developed rapidly and were very profitable, thus not only providing a great amount of jobs for rural residents, but also generating high revenues for regional/local governments (Naughton 2007). Given its tremendous success, as well as political legitimacy resulting from its public ownership, this model was widely adopted by many other regions in the 1980s and early 1990s. However, it had a number of problems. A major problem was that favorable treatment from regional/local governments came with heavy local taxes/levies and requirement to absorb more workers assigned by the government, which eventually led to rapidly declining profit rates and

increasing debt/equity ratios (Chow 2002). As a result, although the Southern Jiangsu model was very successful in the early reform period, it later created massive financial losses in TVEs, thus leading to rapidly decreasing regional revenue.

The Zhejiang model emerged in the early 1990s.<sup>5</sup> Similar to liberal state models found in other parts of the world, e.g., the so-called New Economic Model in Latin America (Pisani and Pagan 2004), this model relies on the private sector as the engine of growth and catalyst for generating wealth. Thus, it differs from the Southern Jiangsu model sharply. First, most local governments in Zhejiang tolerated and encouraged private entrepreneurship even when those in other regions were suppressing it (Huang and Di 2004). Second, governments under the Zhejiang model did not intervene in the economy directly. In fact, regional bureaucrats in Zhejiang were keen to facilitate the development of “special markets” – marketplaces for specific goods – and allowed these market institutions to allocate goods and resources. They were also keen to develop private-sector institutions, especially local private financial institutions such as informal credit markets, to provide private firms key factor resources, which were not easily accessible for them (IFC 2000; Zhou 2009). As a result, government allocation faded gradually and market allocation was increasingly common.

Economically, the Zhejiang model was very successful in promoting regional development. Even in the 1980s and early 1990s, the real annual GDP growth rate for Zhejiang – 14 % – outperformed that of Jiangsu – 12.9 % (Huang and Di 2004). However, this model was not accepted by other regions until the mid 1990s, when the Southern Jiangsu model failed, because it was based on private ownership and, thus, was less legitimate politically than the

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<sup>5</sup> The Zhejiang model may be partly traced back to the Wenzhou model (Wenzhou is a prefecture in Zhejiang). In fact, many local governments in Zhejiang also imitated the Southern Jiangsu model in the 1980s. However, they began to emulate the Wenzhou model and adopted liberal policies in the early 1990s under the leadership of then provincial governor Shen Zulun, who was a liberal bureaucrat (Huang 2005).

Southern Jiangsu model. Around the mid 1990s, however, once the failure of the Southern Jiangsu model was revealed, the central government finally ceased ideological discrimination against private entrepreneurship, as discussed in the previous section, and thus many regional and local governments in other provinces (including Jiangsu) began to imitate the regulatory policies of Zhejiang province (*International Finance News* October 9, 2004). Media reports suggested that, since the mid 1990s, government officials in other regions organized learning visits to Zhejiang, sponsored conferences to study the Zhejiang model, among other, similar initiatives. One high level conference illustrates the increasing popularity of the Zhejiang model throughout the nation. A Summit for the Rise of the Central Provinces, sponsored by the Hunan provincial government, made the following statement after top officials in the six central provinces met in Changsha:

The central provinces should seek to find a development model of our own. We cannot and should not copy the Guangdong model, nor the Southern Jiangsu model. Yet, we should continue to learn from the Zhejiang model. ... What we can learn from the Zhejiang model is the following: consistently encouraging and supporting private economy and privatizing state-owned firms; facilitating market allocation and sticking to minimal government intervention; finding realistic growth paths; resisting the temptation to construct government industrial parks and development zones; providing services and guidance to firms, and so on (*Changsha Evening Newspaper* July 25, 2005).

As the Zhejiang model was gaining popularity, deregulation had been sweeping through the nation since the mid 1990s: almost every provincial government issued special government orders to elevate the status of private firms/entrepreneurs, to remove predatory and discriminative regional practices against them, and to ease complex administrative procedures for them (Huang 2005). For example, the provincial government of Jiangxi (an inland and less-developed province) undertook a number of measures to liberalize the regulatory environment

for the private sector. Such measures included, among others: simplifying administrative and regulatory procedures for private firms, strengthening protection of legal rights of private firms, and extending preferential policies formerly awarded only to public firms or foreign invested firms to private firms (Huang 2005).

#### **4. HYPOTHESES**

Figure 1 above shows that both types of private firms (and private enterprises in particular) began to flourish in the late 1990s and early 2000s. Thus, the timing of regional deregulation runs parallel to the period of accelerating entrepreneurial growth. Does regional deregulation play a role in China's entrepreneurial growth?

It is argued here that regional deregulation can facilitate entrepreneurial growth through at least two mechanisms in China's transition economy. First, deregulation reduces government control of economic resources and stimulates market development. Section 2 shows that private firms had difficulty obtaining a variety of critical resources, such as bank credits, because most of these resources were still controlled by the state, which discriminated against private firms. As the government loosened its control over economic resources, and particularly as an increasing number of special markets and private-sector institutions emerged, entrepreneurs could obtain access to these critical resources more easily. This both facilitated potential entrepreneurs in starting businesses and reduced the failure rate of existing entrepreneurial businesses. A case in point is entrepreneurial access to financial credits. Throughout China's reform period, private firms were discriminated against by financial institutions, most of which were government-owned, and thus had difficulties in obtaining loans from the latter (IFC 2000; Zhou 2009). Since the mid 1990s, however, many provinces have deregulated their regional financial markets by

permitting informal credit markets to emerge and develop, thus channeling household savings to private firms. Such informal credit markets have become a key source of credits for many potential entrepreneurs, as well as for existing private firms, particularly small and medium ones (IFC 2000; Huang 2007).

Second, deregulation lifts predatory and discriminatory regulatory policies on entrepreneurship. In Section 2, it is noted that there were entry barriers to many industries for entrepreneurial firms; in addition to these, entrepreneurs usually needed to make extralegal payments for government services and wait for lengthy periods to obtain government services and business licenses in China. As such regulations were removed, albeit often in a piecemeal and gradual manner in many regions (Naughton 2007), potential entrepreneurs encountered less difficulty in starting businesses, and, thus, rates of entrepreneurial entry increased, particularly in previously restricted industries (Capelleras, Mole, Greene, and Storey 2008; Djankov, Porta, Lopez-de-Silanes, and Shleifer 2002). In addition, lifting predatory and discriminatory regulations can also reduce the risk of business failure for existing entrepreneurs. A case in point is the reduction in inspections and mandatory meetings with officials from a number of government agencies, such as the tax inspectorate, sanitation and environmental agencies, and the police. As in many other developing economies, such inspections and mandatory meetings were relatively frequent, and often seen as governmental expropriation by existing entrepreneurs in China because entrepreneurs were often charged extralegal fees, thus increasing their failure risk (IFC 2000). A reduction in such inspections and mandatory meetings, therefore, also reduced the risk of entrepreneurial failure.

Based on the above discussions, it can be argued that deregulation may both increase the entry rate of new entrepreneurial firms and reduce the failure rate of existing ones, thus



increasing the net growth rate of entrepreneurship, which is defined as the entry rate deducted by the failure rate.

**Hypothesis 1:** The greater the extent of deregulation in a region, the faster the growth of entrepreneurship in that region.

The effect of deregulation, however, may vary across regions. As discussed in the previous section, different regions had significantly different regulatory frameworks before all began to adopt deregulation policies during China's reform era. In general, there were two clusters of Chinese provinces before the Zhejiang model was diffused. The Southeastern-Coastal provinces including Guangdong, Hainan, Fujian, Shanghai, and also Zhejiang were relatively "free," with little, or less, discrimination against private entrepreneurship. Apart from Zhejiang, which developed its own liberal state model in the early 1990s without central support, these provinces were granted special regulatory autonomy in the 1980s or early 1990s to develop an open market economy with a robust private sector (Fan and Wang 2001, 2004).

The Inland and Northern provinces, on the other hand, were still dominated by public ownership by the mid 1990s. SOEs or TVEs were still the major forms of enterprises. There were relatively few private firms. In addition to that, existing private firms were marginalized and discriminated against because key economic resources, such as capital, were still controlled and allocated primarily by the government, which favored SOEs or TVEs over private firms (IFC 2000). In addition, compared to the Southeastern-Coastal provinces, the market system in the Inland and Northern provinces was far less developed and, thus, it was difficult, if not impossible, for private firms to obtain a number of key economic resources from the market (Fan

and Wang 2001). Therefore, not only did Inland and Northern provinces have much lower entry rates for private firms, but also had much higher failure rates for existing private firms. Given that deregulation removes predatory and discriminatory government policies against private firms and stimulates free markets that benefit private firms, it is argued here that deregulation would have had a stronger positive effect on entrepreneurial growth in Inland and Northern provinces in the late 1990s and early 2000s.

**Hypothesis 2:** The effect of deregulation on the growth of entrepreneurship is stronger in the Inland and Northern regions than in the Southeastern-Coastal provinces.

The effect of deregulation may also vary over time. Section 3 suggests that most regions had heavy regulatory constraints on private entrepreneurship by the mid 1990s because they copied the Southern Jiangsu model. However, as the popularity of the Zhejiang model grew beginning in the mid 1990s, these regions all began to remove regulatory constraints on private entrepreneurship and develop markets. In the earlier deregulation period, these government efforts might have triggered the entry of a huge quantity of new firms since entrepreneurship was suppressed before deregulation and, thus, most potential entrepreneurs entered other occupations (e.g., workers in TVEs or government employees) under heavy constraints (Walder 2002; Wu 2006). In the later deregulation period, however, the entry rate of entrepreneurial firms turned to a lower but normal level because most regulatory constraints had already been removed. As a result, although deregulation may also have reduced the failure rate of existing firms as discussed above, overall entrepreneurial growth may have decreased because the entry rate of new private

firms may have decreased more rapidly than the failure rate of existing private firms.<sup>6</sup> Thus, the following hypothesis is proposed:

**Hypothesis 3:** The effect of deregulation on the growth of entrepreneurship is stronger in earlier years.

## 5. DATA AND METHODS

I test the hypotheses by examining inter-provincial variation in entrepreneurial growth using provincial-level panel data covering a six year period, from 1998 to 2003. As discussed above, the domestic private sector began to take off but still faced a deficient national institutional environment during this research period. Private property rights were rhetorically protected in the Chinese Constitution only in 2004. And the central government began to tackle problems of predatory and discriminatory regulations seriously only beginning in 2005. However, this period also saw the diffusion of the Zhejiang model, which gave rise to a wave of spontaneous deregulation across regions.

I assembled data from widely-used second-hand sources, including two primary sources for the panel data. The first is the *China Statistical Yearbooks* (China Statistical Bureau 1998 to

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<sup>6</sup> The following hypothesized example might show how deregulation affects net growth of entrepreneurship. Suppose that a region had a constant adult population of 1 million during the entire deregulation period, and relatively few existing private firms – say, 5,000 – under heavy regulatory constraints before deregulation. Also suppose that there were only two deregulation periods. In period 1, this region began its deregulation, thus triggering the entry of a large number of new private firms, say, 10,000; but, still, many firms – say, 500 – out of the 5,000 existing firms failed in this period because markets were not yet developed. Thus, the net growth rate in period 1 was 9.5 firms per 1000 people because the entry rate was 10 firms per 1000 people (10,000 over 1 million) and the failure rate was 0.5 firm per 1000 people (500 over 1 million). In the late deregulation period, called period 2 here, the number of new entry firms dropped to a normal level, say, 5,000; and the number of failed firms dropped, as well, say, to 400 (out of 14,500 existing firms at the beginning of this period). Therefore, the net growth rate in period 2 was 4.6 firms per 1000 people, because the entry rate was 5 firms per 1000 people (5,000 over 1 million) and the failure rate was 0.4 firms per 1000 people (400 over 1 million). This hypothesized example suggests that the entry rate decreased by 5 firms per 1000 people, which was higher than the decrease in the failure rate – 0.1 firms per 1000 people – from period 1 to period 2.

2004). Although often criticized for problems of accuracy and reliability, the *China Statistical Yearbooks* are the only authoritative source for information about numbers and employment for private firms, together with other economic/demographic information, for each province in each year. Finally, recent studies suggest that statistics from *China Statistical Yearbooks* are not systematically biased, but have high internal consistency (Holz 2004).

The second source of the data is the annual reports of the *National Economic Research Institute (NERI) Indices of Marketization of China's Provinces* (Fan and Wang 2001; 2004). The NERI indices use the methodology of *Economic Freedom of the World* to rank Chinese provinces according to their level of market/regulatory/legal development on five general topics: (1) relationship between government and the market, (2) the non-state sector, (3) the manufactured goods market, (4) the factor market, and (5) intermediary institutions and legal environment (Gwartney, Lawson, and Gartzke 2005). Under each topic, there are a number of indices that reflect different aspects of the topic. The values on each index are comparable across different regions and different years. Given that each index reflects one aspect of market/regulatory/legal development in a province, the NERI indices allow researchers to recombine these indices to construct new indices for such factors as deregulation and protection of property rights. A weakness of the NERI indices, however, is that the earliest year available is 1997; thus, my panel data cannot cover earlier years. The indices are, however, available for every year since 1997.

China has 31 provinces (including autonomous regions and province-level municipal cities). However, NERI indices for Tibet are available only for 2001 and after. Thus there are missing data on the two variables constructed from the indices for this autonomous region for

four years (1998 – 2001).<sup>7</sup> There are no missing data for any other provinces for any of the six years. Hence, the final cleaned data set is an unbalanced panel and has 182 province-year observations. However, given that attrition of data for Tibet is captured by  $a_i$  in equation 1 below, it will not cause biased estimates.

### ***5.1 Dependent Variables***

The main purpose of this paper is to test whether deregulation facilitates net entrepreneurial growth in China. Many studies examining the effects of deregulation on entrepreneurship in developed economies primarily measure entrepreneurship using the entry rate of new firms because deregulation is often assumed to affect firm entry, but not firm failure, in such economies (Ahmad and Hoffman 2007). However, as discussed in Section 4, deregulation in a transition economy like China's may increase not only the entry rate of new entrepreneurial firms but also reduce the failure rate of existing ones, thus resulting in net growth of entrepreneurial firms over time, as shown in Figure 1. Therefore, stock measures are more suitable than the entry rate of new firms for this study partly because changes in the stock of private firms take into account both firm formation and firm failures (Gartner and Shane 1995).<sup>8</sup> One stock measure used in this study is the number of private firms per capita in each province each year, which has been used by prior studies to understand the effect of deregulation and economic freedom on entrepreneurship (e.g., Campbell and Rogers 2007; Gohmann, Hobbs, and McCrickard 2008).

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<sup>7</sup> There are missing data on the two variables for Tibet in 2001 because I used the independent variable in year  $t-1$  in the equations.

<sup>8</sup> Stock measures are the only available information on entrepreneurship provided by my data sources, which do not include more detailed information, such as the number of new entry firms and that of failed firms for each year.

Another stock measure used in this study is level of employment in private firms per capita in each province each year. Part of the reason to use this measure, as well, is that deregulation in a transition economy does not simply increase the number of private firms, but may also increase sizes of the firms, and, thus, level of employment in a region. This is because deregulation greatly eases the problem of resource acquisition, which restricts firm expansion, through reducing government control on economic resources and stimulating market development. Prior studies have also used this measure to examine effects of deregulation on entrepreneurship (e.g., Gohmann, Hobbs, and McCrickard 2008).

Given that there are two types of private firms – individual enterprises and private enterprises, this study uses four measures for entrepreneurship: (1) *number of individual enterprises per capita*, (2) *number of private enterprises per capita*, (3) *total employment in individual enterprises per capita*, and (4) *total employment in private enterprises per capita*. These measures are obtained by dividing the number of firms or total employment in each type of firms into the adult population, which is defined as population aged 15 or above in the *China Statistical Yearbooks*. I multiplied the four stock measures by 1000 to facilitate interpretation. As the distribution of these measures disperses widely across provinces, the logarithmic form of the measures is used (the values of the measures are all positive).

## ***5.2 Independent Variable***

To measure the extent of deregulation in each province, I constructed a variable named *deregulation*, which is the simple average of six indices from the NERI indices. As discussed above, deregulation in China's transition economy means both introducing more market coordination into the economy and reducing government control of economic resources (element

1), and lifting predatory and discriminatory regulatory policies (element 2). Based on the availability of indices reflecting these two elements, the following six indices were used to construct this variable – (1) reducing government control of economic resources, (2) extent to which prices of commodities were determined by the market, (3) extent to which bank credits were allocated by the market, (4) the extent to which labor market was fluid, (5) reducing extralegal taxes for firms, and (6) reducing government size.<sup>9</sup> Like the world economic freedom index, all of these indices were adjusted to range roughly between 0 and 10, with higher values assigned to those provinces that have deregulated more substantially and, thus, have more economic freedom. It is found that these indices are positively correlated with each other. Averaging all six, *deregulation* ranges roughly from 0 to 10, with higher values indicating higher extent of deregulation.

Among the six indices, two (extent to which bank credits were allocated by the market and extent to which labor market was fluid) are similar to the two sub-indices in Djankov, McLiesh, and Ramalho 's (2004) ease of doing business index (getting credit and hiring and firing workers), as discussed in Section 3.1. They may primarily reflect element 1 of deregulation because higher values suggest more developed credit and labor markets. The remaining four may be more specific to China's transition economy. Apparently, reducing government control of economic resources and extent to which prices of commodities were determined by the market may reflect element 1 of deregulation. Finally, reducing extralegal taxes for firms and reducing government size may reflect element 2 of deregulation, since they signal a less predatory government (Frye and Shleifer 1997).

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<sup>9</sup> For detailed information on how each of these indices was constructed, see Fan and Wang (2001, 2004).

It should be noted that this measure is not without problems. Constrained by availability of data, this variable does not directly include information on procedures, time, or costs involved in starting a business, registering property, and closing a business, as in Djankov, McLiesh, and Ramalho (2004). Nevertheless, this variable has included other crucial information such as obtaining credit and fluidity of the labor market. In addition, it is possible that the procedures, time, and cost involved in starting a business, registering property, and closing a business may be negatively correlated with “reducing government size,” because smaller government size often indicates a more liberal government and thus more economic freedom for businesses (Gwartney and Lawson 2002). As such, this measure is consistent with the theoretical meaning of deregulation and may, thus, serve as a starting point for further improvement.

### ***5.3 Control Variables***

Based on existing literature, I controlled for the following variables. *GDP per capita* is a measure of economic development. Prior studies suggest that GDP per capita may have a nonlinear effect on entrepreneurship (Martinez 2005). That is, entrepreneurship initially decreases and later increases as GDP per capita increases. Thus, a quadratic term of this variable is also controlled. *GDP growth rate* is an indicator of regional economic health, which may be positively related to entrepreneurial development (Bowen and Clercq 2008). *Property rights protection* is based on two components – percentage of lawyers in the population and extent to which producers’ and investors’ rights are legally protected – both of which are taken from the NERI Indices.<sup>10</sup> I have also included several time-varying demographic variables. *Adult*

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<sup>10</sup> Although often related positively with deregulation, property rights protection, which means protection of the rights of the owner of an asset to use and benefit from the asset and to exclude others from doing so, is different from deregulation (Grossman and Hart 1986). And unlike deregulation, which affects entrepreneurship through the



*population* is used to control for the size of a province, and is measured as the total number of people aged 15 or above. *Illiteracy rate* is the percentage of illiterate or semi-illiterate population in the adult population and is used to control for the stock of human capital of the regional population. All above control variables, except for property rights protection, are taken natural logarithm for their dispersed distribution. In addition, I controlled for a year variable, which equals the year subtracted by 1998, and thus ranges from 0 to 5, in order to see changes in entrepreneurship over the study years.

To test Hypothesis 2, I created a variable called *inland and northern regions*, which is coded 1 if the province is located in Inland or Northern regions, and 0 if it is one of the five Southeastern-Coastal provinces discussed in Section 4. This variable is time-constant, and, thus, cannot be added as a control variable in fixed effects panel data models, but will be captured by  $a_i$  in equation (1) below. I also attempted to include other often-used variables in entrepreneurship studies, such as minority rate, female rate, percentage of labor force in the agricultural sector, and median age of the adult population (Sobel 2008). These variables were dropped from the equations because their values vary little from year to year and, thus, their coefficients cannot be estimated consistently in fixed effects panel data models (Wooldridge 2002). However, they may largely be captured by  $a_i$  in Equation (1).

#### ***5.4 Model Specification***

I use fixed effects model to test the hypotheses. Fixed effects model is appropriate for this study because it estimates average within-province changes in entrepreneurship as the regulatory environment changes over time. In addition, it produces less biased estimates than pooled

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two mechanisms discussed in Section 3, property rights protection affects entrepreneurship because potential entrepreneurs invest only if they expect to be able to keep the fruits of their investment (North 1990).

Ordinary Least Squares regression because it controls for all unobserved, time-constant factors (such as geographic location) or factors that vary little over time (such as regional political culture or regional openness to the outside world<sup>11</sup>) that could be correlated with both deregulation and the measures for entrepreneurship (Wooldridge 2002). A general representation of the panel data models that I estimated is shown in the following equation:

$$Y_{it} = X_{i,t-1}\beta + a_i + \mu_{it} \quad (1)$$

for  $i = 1, 2, \dots, 31$  provinces;  $t = 1998, 1999, \dots, 2003$ .

In the above equation,  $Y_{it}$  is the dependent variable in year  $t$ ;  $\beta$  is a vector of the effects of the covariates on the dependent variable, because  $X_{i,t-1}$  is a vector of time-varying covariates in year  $t-1$ ;  $a_i$  is a vector of a province specific-constant term and is fixed over time; and  $\mu_{it}$  is a mean zero error term that varies over both provinces and time. Here, I used the values of all time-varying covariates in year  $t-1$  as predictors because most of the covariates have a lagged effect on entrepreneurship. Specified in this way, a significantly positive coefficient for *deregulation* implies that an increase in the extent of deregulation in a province in year  $t-1$  will result in net growth in the number of private firms (or employment in private firms) per capita in year  $t$ .

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<sup>11</sup> A regional political culture that tolerates government-business ties more might inhibit deregulation but facilitate entrepreneurial growth (Zhou 2009). And a region that is more open to the outside world may facilitate both deregulation and entrepreneurship (IFC 2000). However, values of these two variables change little during the study period of this paper, and would thus be captured largely by  $a_i$  in equation 1. Regional political culture would change little if there were no political and legal reforms, which was the case in the study period. For regional openness to the outside world, the central government opened a number of coastal cities and counties in the 1980s and early 1990s; thus, the level of openness of each region was almost fixed by the late 1990s (Naughton 2007).

## 6. STATISTICAL RESULTS

### 6.1 Major Findings

Table 1 presents descriptive statistics and pairwise correlations among all variables. This table suggests that most of the private firms were small individual enterprises, with up to seven employees, rather than private enterprises, employing at least eight people. It should be noted that, compared to those of more developed countries, the private sector in China was still relatively small during the study period. There were only 29.94 private firms per 1000 people (combining both types of firms). This is significantly lower than the mean of the number of entrepreneurial firms per 1000 people in more developed economies, which is over 50 in high-income countries, and about 40 in upper-middle-income countries (IFC 2006). It is also noted that the zero-order correlations between *deregulation* and four measures of entrepreneurship are all positive. However, the correlation between *deregulation* and *property rights protection* is only .06, suggesting that these two types of institutional development do not go hand in hand in China. The correlation coefficients between all covariates are less than .50, except the one between *GDP per capita* and *property rights protection*, which is .70.

[Insert Table 1 about here]

Table 2 presents coefficients from fixed effects models for testing Hypothesis 1. Equations in this table regress each of the four measures of entrepreneurship on deregulation and all control variables. Results from this table provide clear support for the hypothesis. The coefficients of *deregulation* in all four equations are positive and statistically significant, suggesting that deregulation indeed leads to net entrepreneurial growth. Substantively, the

coefficients mean that a one unit increase in deregulation can increase the number of private enterprises per capita by 4.8 % ( $e^{0.047} - 1$ ), employment in private enterprises per capita by 9.6 % ( $e^{0.092} - 1$ ), the number of individual enterprises per capita by 9.3 % ( $e^{0.089} - 1$ ), and employment in individual enterprises per capita by 9.4 % ( $e^{0.090} - 1$ ). *Ceteris paribus*, if Xinjiang – an inland autonomous provincial region – could increase its score on deregulation from 4.26 to the level of Guangdong (8.92) in 1997, then, in 1998 its number of private enterprises per 1000 people could increase from 1.07 to 1.31, employment in private enterprises per 1000 people from 12.08 to 17.48, number of individual enterprises per 1000 people from 31.79 to 45.57, and employment in individual enterprises per 1000 people from 46.99 to 67.57.

Table 2 shows that the coefficient of property rights protection is not significant. However, this is due to the high correlation between property rights protection and GDP per capita. Additional regression results suggest that property rights protection has a significantly positive effect on entrepreneurship in all equations if both log (GDP per capita) and its quadratic term are removed from the models, thus providing support for the new institutional perspective on the significance of property rights protection (North 1990). There is also some evidence that, consistent with prior findings (e.g., Martinez 2005), entrepreneurship initially decreases and later increases as GDP per capita increases. In addition, GDP growth rate has a positive effect on the growth of individual enterprises, but not private enterprises. This may be because small individual enterprises are more sensitive to short-term economic fluctuation. Thus, an increase in the GDP growth rate could have a strong positive effect on the entry of (but a negative effect on the exit of) such firms; and a decrease in the GDP growth rate could have a strong negative effect on the entry of (but a positive effect on the exit of) such firms.

[Insert Table 2 about here]

Table 3 presents coefficients for testing Hypothesis 2 by adding two interaction variables into the equations in Table 2 (the interaction between *deregulation* and *inland and northern regions* and the interaction between *property rights protection* and *inland and northern regions*). It is found that the coefficient for the interaction between deregulation and Inland and Northern regions is positive and statistically significant in all four models. This suggests that the effect of deregulation is indeed stronger in the Inland and Northern regions than in Southeastern-Coastal provinces. Hence, Hypothesis 2 is supported.

However, the coefficient for the interaction between property rights protection and Inland and Northern regions is small and statistically not significant. Additional regressions suggest that the insignificant effect of this interaction variable is not a result of any possible multicollinearity. As property rights protection has a positive effect on entrepreneurship (after removing GDP per capita and its quadratic term), the insignificant effect of this interaction variable suggests that property rights protection is important in all regions.

[Insert Table 3 about here]

Results for testing Hypothesis 3 are reported in Table 4. Compared to Table 2, the equations in this table have two more interaction variables (the interactions between *deregulation* and *year*, and *property rights protection* and *year*). The coefficient for the interaction between deregulation and year is negative and statistically significant in three out of the four equations.

Overall, therefore, the effect of deregulation is found to be stronger in earlier years when regulatory constraints were higher for all provinces. Hypothesis 3 is, thus, roughly supported.

For the first equation in Table 4, where the dependent variable is the number of private enterprises per capita, it is found that the coefficient for the interaction between deregulation and year, though negative, is not significant. However, the interaction between property rights protection and year is found to be positive and significant in this equation. These results may suggest two things for private enterprises. First, the significance of deregulation for private enterprises did not decrease but continued over the study period. This may be because, unlike small individual enterprises, private enterprises competed more directly with state-owned enterprises and, thus, there were still high regulatory constraints on them (e.g., entry barriers to many industries, as mentioned above), some of which remain in place today. Second, property rights protection has played an increasingly important role in the development of private enterprises over time. As private enterprises were economically more significant than individual enterprises, they were more likely targets for government expropriation. This is because, during the study period, TVEs – the economic engines of many regions, previously – were performing badly and, thus, many regional/local governments tended to squeeze private enterprises for local revenues (Huang 2005). Thus, property rights protection was increasingly important for private enterprises during the study years.

[Insert Table 4 about here]

## ***6.2 Robustness Issues***

It is found above that deregulation has a positive effect on growth of both private and individual enterprises in China. Since deregulation has two elements and is constructed using a number of indices, one may wonder whether the effect of each element differs. Additional regressions suggest that both elements have a significantly positive effect, and that their effects are stronger among Inland and Northern regions, and in earlier years. And, the effects of both elements are statistically indifferent in all regressions.<sup>12</sup> Thus, both elements of deregulation matter for entrepreneurship in China.

Since the mid 1990s, regions which formerly had a large amount of TVEs (primarily, Jiangsu and Shandong) began to privatize TVEs, as well as small State-Owned Enterprises (SOEs); thus, privatization has also become a source of new private enterprises in these regions (Walder 2002). Given that privatization may be positively correlated with deregulation, could privatization confound the effects of deregulation? Since a suitable measure for privatization is not available, it is difficult to control for its effects. However, it should be noted that large scale privatization occurred primarily in certain regions (especially Jiangsu and Shandong). In addition, many TVEs and SOEs were reorganized into cooperative firms, as well as joint-stock companies, rather than private firms, after privatization (Naughton 2007). And those that were transformed into private firms were usually re-registered usually as private enterprises, but not individual enterprises. Thus, privatization may not confound the results in this paper

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<sup>12</sup> Based on the discussion in Section 5.2, element 1, i.e., stimulating free markets and reducing government control, is measured with indices (1), (2), (3) and (4) in Section 5.2. And element 2 – lifting predatory and discriminatory regulations – is measured with indices (5) and (6). Using the specification in Table 3, it is found that for *number of private enterprises per capita*, the chi-square statistic for testing the difference between the coefficients of the two elements equals 1.36 (*p-value* = 0.253); for *total employment in private enterprises per capita*, the chi-square statistic is 0.27 (*p-value* = 0.605); for *number of individual enterprises per capita*, the chi-square statistic is 0.61 (*p-value* = 0.442); for *total employment in individual enterprises per capita*, the chi-square statistic is 1.55 (*p-value* = 0.222).

significantly, and, at most, may have had a limited confounding effect on the development of private enterprises.

One may argue that deregulation and entrepreneurial growth might occur simultaneously in many regions; and thus it is often difficult to determine whether deregulation is the cause or outcome of entrepreneurial growth. This is especially so among Southeastern-Coastal provinces where private entrepreneurship had already developed even before the research period. It is difficult to tackle this reverse causality problem given the difficulty in finding a suitable instrumental variable. However, I have used the dependent variable in year  $t$  and all covariates in year  $t-1$  to partly resolve this problem. Additional regressions were also run to test the hypotheses by using only Inland and Northern regions, where, in general, the private sector was still poorly developed, even by the early 2000s, and thus might have had less effect on regional regulatory policy. Results based on this sub-sample still provide robust support to the hypotheses.

While this study suggests that deregulation matters, I have made no assumption that government intervention is necessarily harmful to entrepreneurship. In fact, local government intervention may also play a role – and maybe an increasingly important role – in entrepreneurial development in certain industries and certain regions. For example, it is often argued that the development of high-tech nongovernmental firms in Beijing's Zhongguancun (China's Silicon Valley), many of which were private firms, would not have been possible without government support (Zhou 2008). Nevertheless, although occasional benevolent government intervention has existed, it has been confined to certain industries (particularly, high-tech ones) and certain regions, such as Beijing (Segal 2003). For most industries and in most regions, private entrepreneurs have had to face regulatory constraints imposed by central and/or local



governments. Thus, deregulatory policies to remove these constraints were more crucial for most private firms than government support in the study period.

## **7. DISCUSSION AND CONCLUSION**

### ***7.1 Implications***

The private entrepreneurial sector developed rapidly in China's transition economy in the late 1990s and early 2000s, despite an overall less conducive national institutional environment. To resolve this puzzle, prior research has emphasized informal institutional arrangements used by Chinese entrepreneurs to address institutional deficiencies.

This study suggests that regional deregulation has also played a significant role in entrepreneurial growth in China. In addition, in contrast to developed economies, both elements of deregulation (i.e., not only lifting predatory and discriminatory regulations but also stimulating markets) matter for entrepreneurship in China. However, there appear to be diminishing returns to deregulation as its effects are greater in earlier transition periods, as well as among less-developed Inland and Northern regions, in which markets are less developed and regulatory constraints on entrepreneurship higher.

Could these results be generalized to other transition or developing economies? The answer may be yes. It has been noted that predatory and discriminatory regulations are a widely spread phenomenon among transition or developing economies (Frye and Shleifer 1997). In addition, key economic resources in such economies are often allocated not through markets but controlled by government agencies, which often treat different firms differently with those that are politically connected enjoying substantial advantages (Aidis, Estrin, and Mickiewicz 2008; Piaani and Pagan 2004; Smallbone and Welter 2001). In this sense, most problems faced by

Chinese entrepreneurs are not unique but shared by their counterparts in many transition or developing economies. Therefore, deregulation should have similar effects on entrepreneurial growth in these economies, as well.

These findings may have implications for public policy in China, as well as other transition or developing economies. First, the findings suggest that deregulation may be a necessary first step in facilitating entrepreneurial growth in a transition or developing economy because of the existence of predatory and discriminatory regulations and less developed markets. Second, the findings of decreasing effects of deregulation but possibly increasing effects of property rights protection may imply that deregulation alone may not resolve all of the problems faced by entrepreneurs in a transition or developing economy. Thus, other policies, such as strengthening property rights protection, should be introduced to further facilitate entrepreneurial growth. Future research may study these other policy options and test whether they have positive effects on entrepreneurial growth.

## ***7.2 Conclusion***

This study argues that regional deregulation plays a major role in rapid entrepreneurial growth in China because it stimulates free markets and lifts predatory and discriminatory regulatory policies affecting entrepreneurship. Its hypotheses are tested using provincial-level panel data (1998-2003). Its results, based on fixed effects estimation, suggest that deregulation indeed has a significantly positive effect on entrepreneurial growth within regions. In addition, the effect is found to be stronger in earlier years, as well as among less developed Inland and Northern regions.

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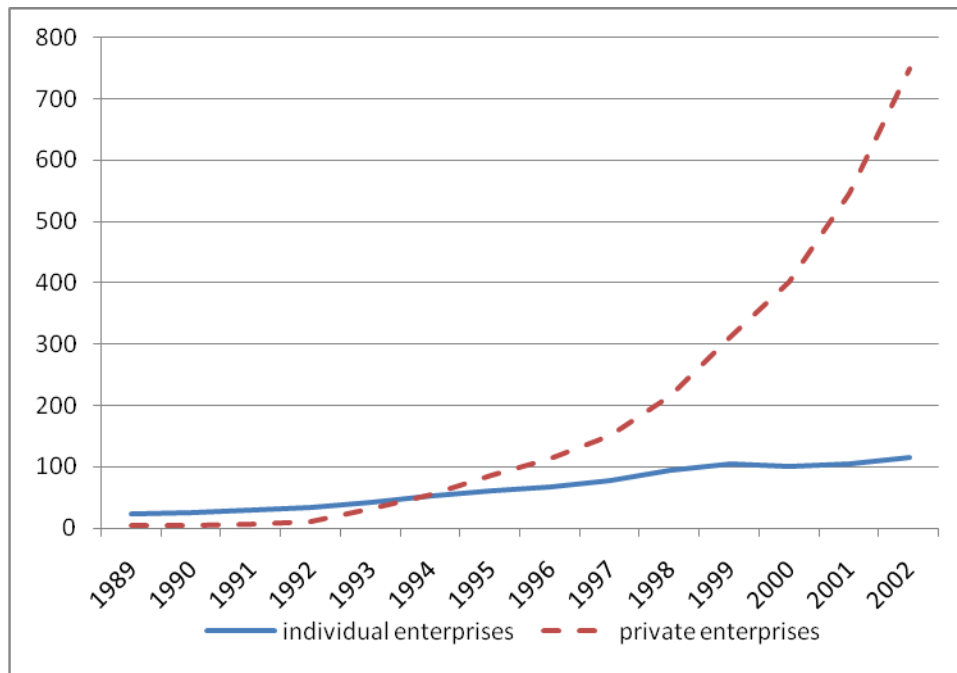
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**Figure 1. Growth of Total Registered Capital of Private Firms, 1989 – 2002.**



Source: Huang (2005).

Notes: The unit of the Y-axis is one billion Chinese Yuan. Registered capital is the sum of tangible and intangible assets owned by a firm, and is thus equivalent to ownership equity. The numbers on the Y-axis have been adjusted for inflation using the consumer price index (1985 = 100).

**Table 1 Descriptive Statistics and Pairwise Correlation Matrix**

Variable	Mean	S.D.	N	1	2	3	4	5	6	7	8	9	10	11
Number of private enterprises per 1000 people	2.480	2.883	186											
Private enterprises per 1000 people	31.627	32.737	186	0.889										
Number of individual enterprises per 1000 people	27.461	9.823	186	-0.068	0.044									
Government expenditure per 1000 people	51.671	22.774	186	-0.185	-0.044	0.908								
Government expenditure per 1000 people	5.753	1.821	182	0.278	0.325	0.110	0.186							
Government expenditure per 1000 people	4.608	2.025	182	0.516	0.377	0.092	-0.060	0.062						
Government expenditure per 1000 people	14.004	10.012	186	-0.286	-0.267	-0.066	-0.115	-0.404	-0.282					
Government expenditure per 1000 people	8.387	6.347	186	0.922	0.821	-0.068	-0.167	0.284	0.700	-0.346				
Government expenditure per 1000 people	9.541	14.56	186	0.318	0.325	0.114	0.113	0.087	0.133	0.097	0.380			
Government expenditure per 1000 people	30.737	19.696	186	-0.214	-0.128	0.089	0.244	0.477	-0.231	-0.271	-0.118	0.034		
Government expenditure per 1000 people	2.5	1.712	186	0.238	0.320	-0.277	-0.205	0.070	-0.352	-0.269	0.186	0.039	0.032	
Government expenditure per 1000 people	0.808	0.396	186	-0.379	-0.374	0.036	0.105	-0.395	-0.189	0.165	-0.395	-0.142	0.051	0.000

Correlations with an absolute value exceeding 0.15 are significant at  $p = 0.05$ , and correlations exceeding 0.20 are significant at  $p = 0.01$ .

**Table 2 Fixed Effects Estimates for Predicting Entrepreneurship, Baseline Models**

VARIABLES	No. of private enterprises per capita	Total employment in private enterprises per capita	No. of individual enterprises per capita	Total employment in individual enterprises per capita
Deregulation	0.047*** (0.015)	0.092*** (0.028)	0.089*** (0.016)	0.090*** (0.018)
Property rights protection	-0.002 (0.013)	-0.013 (0.017)	0.011 (0.009)	0.006 (0.010)
Illiteracy rate (logged)	0.009 (0.043)	-0.022 (0.051)	0.037 (0.047)	0.038 (0.053)
GDP per capita (logged)	-1.206 (0.855)	-1.219 (0.979)	-1.529** (0.709)	-1.188 (0.736)
Log (GDP per capita) squared	0.358 (0.245)	0.623** (0.268)	0.240** (0.099)	0.187* (0.100)
GDP growth rate (logged)	0.101 (0.105)	0.083 (0.154)	0.365*** (0.116)	0.392*** (0.113)
Adult population (logged)	-1.047** (0.470)	-1.209** (0.549)	-0.050 (0.331)	-0.099 (0.358)
Year	0.143*** (0.034)	0.062 (0.051)	-0.018 (0.034)	-0.019 (0.035)
Constant	3.896** (1.946)	6.065*** (1.966)	3.987*** (1.331)	4.261*** (1.390)
Province-year Observations	182	182	182	182
R <sup>2</sup>	0.704	0.643	0.418	0.368
No. of provinces	31	31	31	31

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01 (two-tailed tests)

Notes: Robust standard errors are in parentheses.

**Table 3 Fixed Effects Estimates for Predicting Entrepreneurship, Interaction between Deregulation and Regions**

VARIABLES	No. of private enterprises per capita	Total employment in private enterprises per capita	No. of individual enterprises per capita	Total employment in individual enterprises per capita
Deregulation	-0.006 (0.029)	-0.037 (0.037)	0.030 (0.020)	0.034 (0.021)
Deregulation × inland and north regions	0.067* (0.034)	0.164*** (0.057)	0.075*** (0.027)	0.074*** (0.028)
Property rights protection	-0.005 (0.027)	-0.021 (0.025)	0.010 (0.012)	0.012 (0.013)
Property rights protection × inland and north regions	0.002 (0.025)	0.009 (0.023)	0.000 (0.017)	-0.010 (0.020)
Illiteracy rate (logged)	0.012 (0.041)	-0.013 (0.049)	0.041 (0.046)	0.040 (0.053)
GDP per capita (logged)	-1.457 (0.902)	-1.823* (1.069)	-1.816** (0.734)	-1.503* (0.767)
Log (GDP per capita) squared	0.389 (0.256)	0.697** (0.276)	0.275*** (0.103)	0.222** (0.104)
GDP growth rate (logged)	0.123 (0.111)	0.137 (0.148)	0.387*** (0.116)	0.409*** (0.113)
Adult population (logged)	-1.116** (0.517)	-1.383** (0.542)	-0.123 (0.313)	-0.152 (0.342)
Year	0.152*** (0.032)	0.086* (0.050)	-0.007 (0.034)	-0.009 (0.035)
Constant	4.416** (2.107)	7.329*** (2.048)	4.567*** (1.343)	4.845*** (1.397)
Province-year Observations	182	182	182	182
R <sup>2</sup>	0.707	0.658	0.430	0.383
No. of provinces	31	31	31	31

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01 (two-tailed tests)

Notes: Robust standard errors are in parentheses.

**Table 4 Fixed Effects Estimates for Predicting Entrepreneurship, Interaction between Deregulation and Year**

VARIABLES	No. of private enterprises per capita	Total employment in private enterprises per capita	No. of individual enterprises per capita	Total employment in individual enterprises per capita
Deregulation	0.043** (0.017)	0.111*** (0.031)	0.102*** (0.018)	0.108*** (0.021)
Deregulation × year	-0.006 (0.009)	-0.016* (0.008)	-0.011** (0.005)	-0.013** (0.007)
Property rights protection	-0.030 (0.021)	0.005 (0.022)	0.024 (0.018)	0.026 (0.021)
Property rights protection × year	0.015** (0.007)	-0.003 (0.008)	-0.003 (0.006)	-0.006 (0.007)
Illiteracy rate (logged)	0.060 (0.041)	-0.001 (0.054)	0.051 (0.051)	0.049 (0.057)
GDP per capita (logged)	-0.444 (0.943)	-2.073 (1.269)	-2.151** (0.826)	-2.093** (0.809)
Log (GDP per capita) squared	0.182 (0.252)	0.816** (0.351)	0.381** (0.152)	0.392** (0.157)
GDP growth rate (logged)	0.183 (0.126)	0.097 (0.169)	0.372*** (0.121)	0.391*** (0.121)
Adult population (logged)	-1.122** (0.528)	-1.408*** (0.536)	-0.187 (0.338)	-0.266 (0.371)
Year	0.119** (0.057)	0.187** (0.072)	0.070 (0.058)	0.097 (0.066)
Constant	3.200 (2.029)	7.249*** (2.182)	4.838*** (1.424)	5.452*** (1.478)
Province-year Observations	182	182	182	182
R <sup>2</sup>	0.717	0.651	0.431	0.388
No. of provinces	31	31	31	31

\* p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01 (two-tailed tests)

Robust standard errors are in parentheses.