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## **Lowering Entry Barriers (but also Providing Resources): How Governments Spur Founding**

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### **Abstract**

When are lowering entry barriers sufficient for governments to spur firm founding? While some studies show that reforms increases founding, other studies show such policies do not. We seek to answer this question through studying two sequential reforms in China: the 1994 Company Law and the 1998 restructuring of the Chinese Academy of Sciences (CAS) through the Knowledge Innovation Program (KIP). Through a nationwide dataset of certified high-tech firms in China, our study finds lowering barriers (1994 Company Law) may not be sufficient to promote high-tech founding. Under such circumstances, these policies need complementary changes that supply additional resources (1998 CAS-KIP). Moreover, these policies need a local government sector with government officials who support lowering entry barriers and with public research organizations that can supply the scientific knowledge to take advantage of these policies. Through studying a policy sequence, rather than just a single policy, this study adds to the institutional research on public policy and has implications as to how governments spur entrepreneurship.

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### **ABSTRACT**

When are lowering entry barriers sufficient for governments to spur firm founding? While some studies show that reforms increases founding, other studies show such policies do not. We seek to answer this question through studying two sequential reforms in China: the 1994 Company Law and the 1998 restructuring of the Chinese Academy of Sciences (CAS) through the Knowledge Innovation Program (KIP). Through a nationwide dataset of certified high-tech firms in China, our study finds lowering barriers (1994 Company Law) may not be sufficient to promote high-tech founding. Under such circumstances, these policies need complementary changes that supply additional resources (1998 CAS-KIP). Moreover, these policies need a local government sector with government officials who support lowering entry barriers and with public research organizations that can supply the scientific knowledge to take advantage of these policies. Through studying a policy sequence, rather than just a single policy, this study adds to the institutional research on public policy and has implications as to how governments spur entrepreneurship.

Keywords: Institutional Theory, Institutional Change, Public Policy, Government, Entrepreneurship

### **INTRODUCTION**

States across the world are trying to promote economic growth through entrepreneurship. Since 2006, 186 different countries have implemented 456 reforms particularly devoted to stimulating entrepreneurship in the private sector (1). However, empirical studies find mixed effects on firm founding for these reforms. Some studies show that these policies increase founding (2, 3). Conversely, other studies find that these policies fail to do so (4). As one scholar succinctly noted, “The one thing that is generally agreed on about the consequences of these reforms is that things have not quite worked out the way they were intended (5, p. 974).” Why then are there mixed effects of public policy on founding?

Prior institutional theory research argues that reforms increase founding if they lower barriers to entry such as by easing the capital requirements for starting a firm (6). For example, in the U.S. independent power and railroad sectors, public policies that reduce capital requirements, through providing financial support, increased founding (7, 8). In the U.S. soft

drink industry, public policy lowered barriers to entry by enabling entrepreneurs to redeploy existing physical assets cheaply, thereby increasing founding (8, 9). After policies lowered the barriers for starting wind energy firms, more founding occurred and was amplified by local public support for these reforms, such as support from local Sierra clubs (10). Thus, public policies that lower barriers to entry can spur founding.

Yet, what remains unclear is whether public policies that lower entry barriers will increase founding when existing institutions either do not support such policies or do not have the capacity to supply adequate resources for the implementation of these policies. For example, in the electric power industry, local interests that oppose public sector reforms in the industry may stifle their implementation (11). Similarly, it is likely that a lack of resources can also stymie public policy implementation. For example, some emerging economies such as Jamaica are limited in their development of high-technology industries due to the lack of educational attainment in their workforce (12). Thus, while public policies that lower barriers to entry may increase firm founding, it is unclear whether these policies will be effective when existing institutions are either unwilling to support these policies or incapable of supplying sufficient resources. Given this, we ask: when are lowering entry barriers sufficient for governments to spur founding?

To investigate this question, we construct a nationwide dataset of certified high-tech ventures to explore the case of two sequential institutional changes in China. The first is the 1994 Company Law, which was a legal change that lowered entry barriers by reducing capital requirements for starting a high-tech firm. The second, four years later, is the 1998 Chinese Academy of Sciences Knowledge Innovation Program (CAS-KIP), which restructured the CAS from focusing on science in isolation to more explicitly linking its science to market needs. The

first institutional change lowered barriers to entry. The second institutional change provided more resources (i.e. knowledge) for potential entrepreneurs by opening up scientific knowledge to markets. Both of these changes were intended to alter the institutional environment to increase high-tech entrepreneurship. In support of our quantitative analysis, we also conducted over 40 interviews in Chinese with entrepreneurs, government officials, and venture capitalists to get a better contextual understanding of these reforms.

Our study attempts to contribute to institutional theory, particularly to the research on institutional change and its nexus with entrepreneurship. First, we contribute the insight that institutional changes that effectively increase entrepreneurship are often multi-faceted – i.e., lowering entry barriers per se does not ensure adequate resources (i.e. know-how) to spur entrepreneurship. Prior research on institutional change and entrepreneurship finds that policies which lower entry barriers spur entrepreneurship (7, 8). Our study adds the insight that such focused policies to lowering entry barriers are effective only when the current institutional environment is willing and able to provide sufficient resources to support the founding of firms. Second, we contribute the insight that a sequence of institutional changes may be needed to reach a desired outcome such as entrepreneurial founding. While prior research shows how a single institutional change comes to be adopted (13, 14), we find that a single change may be insufficient to attain the desired outcome and instead that a sequence of changes is needed. Finally, we contribute the insight that implementation of national institutional changes depends upon the willingness and capacity of local institutions to enact those changes. Prior research shows how changes depend upon how national policies are enacted (13, 14); and separately upon how changes (or lack thereof) result from the ways policies are locally implemented (11). However, this prior work leaves open how institutional support varies across levels of analysis

(i.e. national and local), across institutions (i.e. CAS and government), and over a sequence of institutional changes. Our study fills this gap.

## **THEORY DEVELOPMENT AND HYPOTHESES**

### **Lowering Entry Barriers: 1994 Company Law**

Public policy can lower entry barriers that previously deterred individuals from starting new firms – i.e., these barriers can lower the costs of engaging in entrepreneurship. For example, public policies can lower entry barriers through reducing capital requirements (2), reducing transaction costs (3), and increasing available resources through public subsidies or freeing up existing physical capital (7, 8). The overall premise is when public policies lower obstacles to entry, such as through reducing entry costs, founding increases.

We extend this work by arguing that such policy aims may be thwarted by local officials who disagree with these policies. That is, national policies that aim to lower entry barriers, such as through reducing capital requirements, may meet resistance at the local level. In federalist societies such as the US, India, and China, where power is divided between central and local governments, national policies that seek to lower entry barriers may be met with resistance by local officials who do not share such desires. Because allocating power to local government officials allows them to act in their own interests (15) and according to their own ideologies, local government officials in federalist systems can and do counter the aims of national policy (16). Because domestic stakeholders against a reform can block its implementation (11), local officials may attempt to thwart a national policy with which they do not agree.

In the case of a national policy that aims to spur entrepreneurship, we argue that some more state-oriented local officials may prefer to retain greater control of their markets, and so will add regulations to counter the effects of a national reform. In contrast, other more market-

oriented local officials who prefer open markets and less government control are more likely to implement such a reform and avoid blocking it. For example, reducing capital requirements often entails standardizing registration procedures to reduce the ability of government officials to exercise discretion (13, 17). More market-oriented government officials are likely to agree with these reforms as they share these underlying beliefs that government intervention in markets is inefficient and should be curtailed (18, *“liberal-market” ideology*). By contrast, more state-oriented government officials are unlikely to share these views because their underlying beliefs are that governments need to help to develop markets. These officials believe governments should actively intervene (18, *“corporatist” ideology*). Underlying these reforms is an ideological debate over the degree to which governments should intervene in commercial markets. Therefore, effective implementation of reforms that lower entry barriers requires national and local government officials to have aligned ideological views regarding the role of government in shaping the direction of markets.

In China, the 1994 Company Law is an important example of a national reform that aims to lower entry barriers to entrepreneurship. The historical importance of this law is widely recognized in China. The Chinese press noted the law as a “historical leap forward” and the Vice-chairman of the State Commission for Economics and Trade at the time, Chen Qingtai, called the law the “most important piece of legislation for regulating business entities” (19, p. 492). Of particular importance here, the law, for the first time, set universal minimum registration requirements that local governments previously had autonomy to set (20). A firm’s registered capital is the founding capital a government requires to start a firm. The 1994 Company Law set the minimum required capital for most Chinese companies at 500,000 CNY (approximately 58,000 USD). However, for companies engaged in science and technology, the

minimum required capital was set at 100,000 CNY (approximately 12,000 USD). In standardizing minimum registration requirements and lowering those requirements, the objective was to reduce entry costs and arbitrary government intervention in the hope of encouraging entrepreneurship (21). Overall, this policy is typical of reforms seeking to lower entry barriers for high-tech entrepreneurship by lower registration costs and to inhibit local government intervention through standardizing requirements.

However, the 1994 Company Law generated local implementation differences because provincial governments had the ability to add regulations that could increase their control over their local markets. This was possible because national Chinese law depends upon implementation by provincial governments. Moreover, unlike other Chinese laws, the Company Law lacked implementation rules that typically help clarify ambiguities within the law (22). While some involved in the construction of the law thought that there were provisions that could curb local intervention in the registration process (23), the opposite seemed to occur. Some local government agencies exploited this lack of specificity by adding their own requirements that were not covered in the original law.

Two examples help to illustrate how this occurred. Example 1: the 1994 Sichuan Province Private Enterprise Regulations directly stipulates additional capital requirements beyond those in the earlier 1994 Company Law. In the law, Articles 10 and 11 directly cited the 1994 Company Law, indicating the provincial government was aware of the national law. Yet, immediately thereafter, in Articles 12-13, the province added capital requirements that were not explicitly made in the 1994 Company Law such as higher requirements based on ownership type. Other more state-oriented provinces also created additional capital requirements. For example, reporters observed additional capital requirements in Hainan province (24). These examples

indicate that even though national reforms sought to standardize and lower registration requirements, more state-oriented provinces were reluctant to give up market control and added capital requirements that were unrelated to and more onerous than the 1994 Chinese Company Law stipulated.

Example 2: at nearly the same time, the Jiangsu Development of Individual and Private Economy Regulations aligned the capital requirements of this more market-oriented province with the 1994 Company Law. Beyond having no discernible additional capital requirements, the Jiangsu Province regulation had 19 fewer articles than the Sichuanese law. Many of these additional articles come from Sections 2 and 3 in the Sichuanese regulations that dictate how the local private sector is to be structured and registered under the auspices of the provincial government. By contrast, Jiangsu had few such regulations. This lack of direct private sector regulation occurred in other more market-oriented provinces as well. For example, the same reporters, who documented the additional registration requirements in the state-oriented Hainan Province, simultaneously noted that municipalities within market-oriented Guangdong Province were simplifying their requirements (24).

The two contrasting examples of Sichuan and Jiangsu provinces are also corroborated by our interviews with officials in each province. When we asked whether it is the responsibility of the government or the venture to create the market, a Sichuan official from Chengdu noted that the government believes they need to “help develop markets”. In contrast, Jiangsu officials from Suzhou stated that market development was the responsibility of entrepreneurs. As with the example above, we see a preference for government involvement in the more state-oriented Sichuan that contrast with the preference in more market-oriented Jiangsu Province for less government involvement in markets.

National reforms that lower entry barriers, particularly through lowering capital requirements and standardizing them, aim to reduce government involvement in markets by stimulating more entry with fewer regulations. More market-oriented local officials are aligned with the notion that governments should be less involved in markets, and so are more likely to adopt such national reforms. In contrast, more state-oriented local officials prefer more involvement in local markets, and so are more likely to obstruct such policy through adding regulations that mitigate the effects of such national reforms. Therefore, we hypothesize:

Hypothesis 1: After national policies lower entry barriers (1994 Company Law reform), local entry costs (registered capital) decrease, especially in more market-oriented provinces.

Consistent with prior work (2), we also argue that by lowering barriers to entry, reforms such as the 1994 Company Law are likely to increase founding (2). However, heightened misalignment between national and local officials can stymie implementation of national policies (25, 26). In the context of the 1994 Company Law, we extend these findings to argue that the law will be implemented in market-oriented provinces where local officials support reforms that lower entry barriers, and so entrepreneurs will be more likely to benefit from lower capital requirements and, thus, found more firms. However, in those state-oriented provinces where officials are against such reforms, the intent of the law may be thwarted through additional regulations that render entrepreneurs less likely to benefit from lower capital requirements. Therefore, those in state oriented provinces will not found as many firms as they otherwise would, so we hypothesize:

Hypothesis 2: After national policies lower entry barriers (1994 Company Law reform), local founding increases, especially in more market-oriented provinces.

## **Providing Resources: 1998 Chinese Academy of Sciences – Knowledge Innovation Program**

We next argue that effective institutional changes require that sufficient resources exist in the current market to take advantage of such changes. For example, after policies were enacted that lowered the barriers to starting micro-radio stations and to starting wind energy firms, founding increased where there were nearby non-profits that could provide know-how regarding how to found such firms (10, 27). Reforms that encouraged entrepreneurship in the railroad industry were particularly useful when entrepreneurs were able to use existing railroad infrastructure (8). Hiatt et al. (9) found that carbonated beverage entrepreneurs could easily modify existing manufacturing assets for beer to produce carbonated beverages instead. This ability to redeploy existing manufacturing resources allowed these entrepreneurs take advantage of the opportunities that the temperance movement created in its successful campaign against breweries. In these cases, entrepreneurs were able to take advantage of policies that lowered barriers to entrepreneurship because there were sufficient resources available to them in their markets.

But when sufficient resources do not exist, we argue that the public sector can be helpful in providing these resources, such as knowledge resources that can help entrepreneurs to take advantage of government policies to spur entrepreneurship. Prior research supports the argument that the public sector can provide such knowledge resources. For example, government agencies may supply technical knowledge that is crucial for generating technological breakthroughs. From 1946-1962, US weapon system advancements produced 710 different scientific and technological breakthroughs, most of which the Department of Defense directly funded, and which generated value beyond the defense sector (28). In the US telecom and computing industries, important technological advancements were made through initiatives spearheaded by

the US Defense Advanced Research Projects Agency (DARPA) (29). The twelve major technologies that differentiated the iPhone, iPod, and iPad from rival products emanated from scientific research conducted through government laboratories (30). The government's ability to supply novel technical knowledge to markets is particularly important when such know-how is limited. For example, in the Argentine wine industry, firms that could address their lack of sufficient viticulture knowledge through ties to government sources of such knowledge were better able to upgrade their products (31). Therefore, to realize the aims of public policy seeking to promote high-tech entrepreneurship such as we study here, government agencies must have the ability to bring their technical knowledge to markets where it is lacking. We argue that such knowledge can help entrepreneurs take advantage of policies that lower entry barriers to entrepreneurship in instances where such know-how is limited.

Governments are well-suited to provide such knowledge. Unlike firms that keep their knowledge closed and usually only share their knowledge through exclusive agreements that limits the diffusion of knowledge, government research organizations are public organizations whose knowledge is usually open. Since government knowledge is more open than other knowledge and that knowledge is more readily transferred when proximity is high, firms and individuals located near government research organizations are particularly able to access the public knowledge that they need to innovate, even if they do not have direct linkages to such agencies (32). Therefore, firms in locations with more of these public research organizations are more likely to have access to public knowledge.

These arguments are relevant to our hypotheses. Specifically, in the early 1990s, firms in China's high-tech markets possessed limited knowledge. For example, in 1990, according to UN statistics, China's exports in ICT was less than 1% of the world's total ICT exports (33), and

China's value added from its knowledge and technology-intensive sectors<sup>1</sup> was only 4% of that in the US (34). Therefore, few firms and potential entrepreneurs had sufficient knowledge to participate in high-technology sectors, let alone take advantage of the 1994 Company Law that was designed to spur entrepreneurship in these sectors.

To address this issue, the Chinese Academy of Sciences (CAS), the key knowledge infrastructure in the country's public sector, launched the Knowledge Innovation Program (KIP) in 1998. This reform restructured the CAS to better open government-based technical knowledge to high-technology sectors. Since the earliest years of the CAS, the linkages between the science developed at the CAS and the greater Chinese society were weak. In fact, the first CAS president Guo Moruo stated in 1954, "the main defect with the leadership of the Academy is failure to conduct research into the needs of national construction" (35, p. 52). These disconnects continued as China shifted from a planned to a market economy. As one senior CAS official noted just prior to the launch of CAS-KIP, "*We have lagged behind the country's transition from planned economy to market economy*" (36). This lack of connectivity led to unsuccessful earlier policy attempts to improve the Chinese economy because the scientific improvements needed for such policies were not reaching those who could use them in commercial markets (37). Overall, prior to the 1998 CAS-KIP, the lack of connectivity between the CAS and Chinese commercial markets prevented the translation of CAS science into usable innovations.

The CAS's lack of connectivity forced the leadership to initiate internal reform. In 1995, then CAS president Guangzhao Zhou wrote in *Science* that "it is essential that CAS undergo major reforms to keep up with developments in China and throughout the world" (38p. 1153). In

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<sup>1</sup> High-technology manufacturing and/or knowledge-intensive services are business, financial, and communications services; education; health; aerospace, communications and semiconductors, computers and office machinery, pharmaceuticals, and scientific instruments and measuring equipment.

1997, Yongxiang Lu became the first engineer to be named CAS president (39). As an engineer, Lu clearly signaled his intent to steer CAS towards improving its ability to translate science into commerce when he stated that “new scientific knowledge and inventions need to be industrialized” (40, p. 1548). Only four months after his appointment, on January 1998, Lu introduced KIP with the aim of revamping the CAS to attack problems that were both at the frontiers of global science and could address national economic needs (41).

A central mandate of KIP was to spur “CAS-local cooperation”, whereby local CAS institutes were encouraged to collaborate with local companies and governments. As Chinese scholars noted, KIP was a new “social contract between CAS and Chinese society and politics” (42, p. 2). Two examples help illustrate how such activity transpired. Example 1: the founding of the Shenyang-CAS New Fertilizer Co, Ltd based on technology from the CAS Institute of Applied Ecology. In 1998, the research of Dr. Shi Yuanliang within this CAS led to the development of a slow-release fertilizer, which compared to conventional fertilizers, significantly reduced runoff, improved efficiency, and reduced nitrous oxide emissions. A new company was formed to commercialize this technology. As of 2007, the company’s revenues had totaled over 2.6 billion RMB (approximately 430 million USD) (43, p. 48, 44). In this example, a CAS technology breakthrough directly contributed to the launching of a new firm.

Example 2: restructuring of an entire section of the CAS-Chengdu Institute of Organic Chemistry into a stand-alone organizational unit, the CAS Chengdu Organic Chemistry Co., Ltd. From interviews that we personally conducted with a top official in the Institute, the objective for doing this was to take innovations developed within the Institute and directly reach out to entrepreneurs well-suited to commercialize these innovations with the goal of developing new firms. The unit’s revenues would then return to the CAS researchers to maintain the Institute’s

scientific capabilities. Such a practice is similar to that of several other CAS institutes such as the National Institute of Physics (45, p. 79-80). In this example, the CAS developed stand-alone organizational units that directly reached out to entrepreneurs who then could successfully use these technological breakthroughs to capture new market opportunities. As seen from these two examples, after CAS-KIP, the CAS went from engaging in science in isolation to bringing its science into contact with entrepreneurs who could commercialize that knowledge.

Overall, we argue that government agencies provide an important source of knowledge for taking advantage of policies that lower entry barriers to entrepreneurship, especially when existing know-how is limited. In China, the restructuring of CAS through KIP helped better bring scientific knowledge to the market. After CAS-KIP, through identifying entrepreneurs who could use its scientific breakthroughs or directly transfer such breakthroughs through spin-offs, the CAS was able to better supply its technological breakthroughs for use in local entrepreneurial activities. Therefore, we hypothesize:

**Hypothesis 3: After national policies improve the supply of resources to markets (1998 CAS-KIP), local founding increases, especially in provinces with more public research organizations (CAS research institutes).**

For a national policy that lowers entry barriers to increase actual founding, local government officials also need to agree with these reforms. Similarly, government agencies need to be able to supply the necessary scientific knowledge to help entrepreneurs take advantage of these policies when existing know-how is insufficient. These two factors are complementary. Lowering entry barriers, when implemented, make founding firms easier. Providing knowledge supplies the means by which entrepreneurs can take advantage of these policies to found such firms. Therefore, we hypothesize:

Hypothesis 4: After national policies improve the supply of resources to markets (1998 CAS-KIP), local founding increases, especially in provinces that are more market-oriented and with more public research organizations (CAS research institutes).

## METHODOLOGY

### Data Description

To test these hypotheses, we sought to analyze a population of comparable high-tech ventures in China. In this way, we better restrict variation to changes from national reforms and relevant provincial characteristics. To do this, we constructed a novel nationwide dataset of all firms that received high-tech certification in mainland China ([www.innocom.gov.cn](http://www.innocom.gov.cn)) from the beginning of the program in 2008 to 2012, when Xi Jinping replaced Hu Jintao as president of China. To receive this certification, these firms had to pass a set of explicit standards to demonstrate they were genuinely engaged in high-tech activity<sup>2</sup>. Moreover, there is a strong incentive to get certified as those firms that receive high-tech certification can qualify for a 40% reduction in their corporate taxes. Therefore, this program helps ensure we have a highly comparable set of high-tech firms for which to conduct this analysis than is otherwise possible. Moreover, and as confirmed with our interviews with entrepreneurs, the strong incentives of the program reduce the likelihood of having unobservable firms outside the sample that were engaging in similar high-tech activity.

To construct the sample for this study, we first limited the sample to those firms in the private-sector (firms that were not state-owned) and that were not subsidiaries. One potential concern is that there were numerous privatization waves in China during this time. Government units were encouraged to spinoff business functions into new enterprises (46). In the main

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<sup>2</sup> A more detailed discussion of the certification requirements can be found in Article 10 of High-Tech Certification Management Approach (高新技术企业认定管理办, 国科发火 2008 no. 172)

analysis, we maintained these firms in the sample. Similar to spin-offs from large companies or universities (47, 48), these are still startup firms. In addition, and as a robustness check, when we removed these firms that may have come from such privatization efforts, our results remain consistent to those reported. To narrow in on each of the reforms of interest as much as possible, we analyzed those firms that were founded two years before and two years after the reform. Therefore, for the 1994 Company Law, we looked at those firms founded from 1992-1995, and for the 1998 CAS-KIP, we looked at those firms founded from 1996-1999. Our examination of alternative windows (i.e. three years and four years before and after the reform) also yielded similar results. For the registered capital analysis (1994 Company Law), this led to a final sample of 1,748 firms. For the founding analysis (1994 Company Law and 1998 CAS-KIP), we tabulated the total yearly founding rates in each province, which led to a panel dataset of 112 province-years (28 provinces over four years for each reform) for which to conduct each analysis (a total of 224 province-years).

To collect the firm level data, we developed Python code to engage in computer-assisted collection of each firm's registration information from provincial industry and commerce bureaus, and from enterprise credit information websites. When possible, we also collected these data at the municipal level. We then also engaged in the same procedure to collect registration information from private aggregator sites to cross-check the information obtained from state sources. Thus, we have robust and triangulated firm-level measures.

To collect the provincial-level data, we obtained macroeconomic indicators from the CapitalVue database, which supplies these indicators from China's National Bureau of Statistics. We also obtained data from China's National Economic Research Institute (NERI) that supplies marketization indices for each province. Finally, we further conducted over 40 interviews in

Chinese with entrepreneurs, government officials, and venture capitalists to get a better contextual understanding of these reforms.

Because we observe these firms from 2008-2012 but analyze these firms at the time of their founding (1992-1999), there may be potential left-censoring issues that can bias our results. We can envision three such censoring issues. The first is that a firm may have been founded during the time period of interest but may have been acquired before the time in which we observe them. While Chinese M&A data is limited (49), these data indicate that the most significant M&A activity predominantly occurred after 1999 with China's "Go Global" policy (50), which is after the period of this study. The second is that a firm may not have started engaging in high-tech activities but as the firm matures, which is when we observe them, they began to engage in high-tech activities. However, extensive evidence indicates that as firms mature, they tend to be more efficiency-oriented and less engaged in innovative high-tech activities (51, 52). The third is that a firm may have been founded during this study's time period of interest but may have failed before we could observe them. This concern is mitigated by the fact that barriers to exit are known to be high in China (53). In addition, a unique aspect of this dataset is that we are able to observe failures during the observation period which is the early period of venture life when failure is most likely. Moreover, to further address this concern, we include these failures in the analysis. To check this issue further, we plotted the number of failures and founding by year and observe that they track quite closely (available upon request). While these failures are limited, this indicates founding trends seem to also reflect failure trends.

### **Dependent and Independent Variables**

The two dependent variables are Registered Capital and Founding. Registered Capital is the minimum required founding capital for a firm to register with the government. Because data

misreporting has been documented as a problem in China (54), the sample of firms denoted above are those firms in which we could cross-check their registered capital to ensure the analysis accounted for the potential of such misreporting. We adjust for inflation and use the natural logarithm of these values for the analysis.

For Founding, we tabulated all firms founded in the sample for each year and for each province. We then normalized the total founding by the province's population for that year. Finally, we took the natural logarithm of this variable for our analysis to account for skew, as is common practice in similar studies (55).

The independent variables are Reform Year, Market Orientation, CAS, and MOCAS<sub>high</sub>. For the Chinese Company Law, the reform variable was 1 for 1994 and later years and 0 for any year before 1994 (ReformYear<sub>1994</sub>). For CAS-KIP, the reform variable was 1 for 1998 and later years and 0 for any year before 1998 (ReformYear<sub>1998</sub>).

As with prior studies (56), Market Orientation is measured through the marketization index for each province that was provided by the Chinese National Economic Research Institute (NERI). This index uses 23 highly correlated sub-indices grouped around 5 major categories: government-market relationship, non-state sector development, product market development, factor market development, and market intermediary and legal environment development (57, Footnote 11 for further explication of this index). Higher levels of this index indicate a higher level of private sector autonomy and, thus, higher market-orientation. Though these data were first started in 1997, given this index is largely linear and monotonic, we linearly extrapolated the data to infer marketization levels for earlier years. In the Robustness Checks and Alternative Arguments section, we tried alternative measures for Market Orientation and found consistent results.

CAS is the total number of CAS research institutes in a given province for a given year. The founding year and provincial location for each research institute were collected from the CAS website (<http://www.cas.cn>).

Finally,  $MOCAS_{high}$  is a dummy variable for those provinces that are both more market-oriented and have more CAS institutes. This dummy variable has a value of 1 for provinces that are on or above median levels of Market Orientation and CAS and 0 otherwise. We also considered other permutations of this variable in the Robustness Checks and Alternative Arguments section, which also led to consistent results.

### **Controls**

For the regressions on Registered Capital, we added a series of controls. To directly control for data misreporting concerns, we controlled for the number of data sources (Data Sources) and the variance in reported registered capital (VarRegCap) for each firm.

At the firm level, we controlled for other legal requirements that could raise the minimum registered capital requirements for certain high-tech firms, irrespective of the 1994 Company Law and the province's market orientation. The company types for which there were national regulations that stipulate different capital requirements were business groups (group), stock-limited companies (stock-limited), publicly listed companies (listed), collective enterprises (collective), foreign invested, owned, controlled, or joint ventures (foreign), and Hong Kong or Macao-based invested, owned, controlled or joint ventures (HK). We additionally controlled for holding companies to control for those firms that may have obtained their high-tech certification through buying the high-tech assets of other companies rather than creating their own technologies. The business activities for which national regulations stipulated different capital requirements were wholesale (wholesale), manufacturing (manufacturing), or retail (retail)

activities. National regulations stipulate that capital requirements may change depending upon the government level at which the company is registered, and so we controlled for whether the firm was registered at the city (city registration) or province (province registration) level. Finally, national regulations stipulated different capital requirements if the company used the name of the province in their registered name (Province Name).

At the industry level, we controlled for the eight key industries targeted by the High-Tech Enterprise Certification Program: information technology, biotechnology & new medical technologies, aerospace, new material technologies, high-tech services, new energy & energy conservation technologies, natural resources & environmental technologies, and new technologies to transform traditional industries. We used keywords provided by the management guidelines of the High Tech Certification Program to classify the industry or industries of each firm based on the company's name and their operational scope.

At the province level, we used data from the China Statistical Yearbook, obtained through the CapitalVue database, to control for the amount of available resources that could make registering a venture easier, irrespective of the 1994 Company Law and the province's market orientation. Besides province fixed effects, we controlled for a province's total number of investors (10,000 people) (investors), GDP per capita, and the total number self-employed individuals (10,000 people) (self-employ). Finally, we added year fixed effects.

For regressions on Founding, similar to other studies (55), we added year and province fixed effects. We also controlled for the number of self-employed individuals (self-employ) to make sure the founding trends observed were particular to high-tech ventures, and not of other forms of entrepreneurship, more generally.

### **Difference-in-Differences Approach**

The research design isolates two sequential reforms, the 1994 Company Law and the 1998 CAS-KIP program. The 1994 Company Law allowed us to analyze policies that lower entry barriers to entrepreneurship in the form of reduced capital requirements. We also expect after the 1994 Company Law, capital requirements should especially decrease and founding should especially increase in more market-oriented provinces. The 1998 CAS-KIP law allowed us to analyze reforms that improve the supply resources to the market through improving the transfer of public sector-based scientific knowledge to local markets. We also expect, after CAS-KIP, founding should especially increase more in those provinces with more local CAS institutes. Altogether, after both reforms, provinces with more local CAS institutes and are more market-oriented should have the greatest increases in founding.

Therefore, we are analyzing separate reform interventions that should also systematically vary across certain groups of provinces. As with other organizational studies that investigate similar issues (58, 59), this led us to employ a difference-in-differences (DiD) research design. This approach was used because it helps better account for permanent differences between groups when assessing the effects of an intervention, which reduces potential endogeneity concerns (60). Similar to those who employed a DiD design (55), we used log-linear regressions with robust errors clustered at the province level.

A natural concern, especially with policy shifts, is that there may be signaling effects whereby firms learn these changes are going to come and react to those changes beforehand. The parallel trends, that we observe prior to the reform and the placebo regressions in the Robustness Checks and Alternative Arguments section, indicate signaling was less likely. Another unique feature of Chinese laws is they stipulate an exact promulgation date, or the date on which the policy will first be implemented. Therefore, even if a firm is able to know of a law before it is

passed, they can only gain the benefits of that law on or after the promulgation date, which further prevents taking advantage of signaling effects. Finally, our interviews indicate that Chinese entrepreneurs themselves often do not want to take the risk of engaging in a venture until after the government has enacted regulations. A medical device entrepreneurs said, “In China, we want to follow rules.” Another biotech entrepreneur said, “You first need to *understand the government’s development plan*”. She further reiterated this saying, “If you start a venture in the absence of government policy, the problems will be much larger” and that few people are willing to take such a risk. The evidence all suggests that Chinese entrepreneurs are hesitant to act upon signaling until they are certain that a reform is actually implemented.

We also engage in different forms of the DiD approach to ensure consistency in the results. Numerous prior examples demonstrate DiD approaches can accommodate not just binary (single treatment vs. control group) but more continuous treatments (i.e. groups vary on “dosage” where some get more of the treatment than others) (61-64). We also re-ran these results with Market Orientation and CAS as binary variables, which were constructed as median splits, and the results were consistent with those reported. Though the narrow four-year time window period (two years before and after the reform) for which we analyzed each of these reforms greatly reduce the potential for serial correlation (60), we conducted additional specifications that are recommended when using this approach. As with other studies (58), we collapsed the four-year time window into time-invariant “pre” and “post” reform cells at the provincial level. For regressions on Founding, we used this approach directly as all variables were at the provincial level. For regressions on Registered Capital, which had both firm-level and provincial-level variables, we followed the recommendations of Bertrand et al. (60) by first regressing Registered Capital on firm-level characteristics and aggregating the residuals from this model into time-

invariant “pre” and “post” reform cells, and then regressing these aggregated residuals on the provincial level characteristics of interest. The results are similar to those reported.

## RESULTS

Tables 1 and 2 show the correlation matrices and descriptive statistics for these analyses.

(Tables 1 and 2 about here)

Hypothesis 1 argues after the 1994 Company Law, entry requirements (registered capital) should decrease and more so in more market-oriented provinces. Therefore, we expect  $\text{ReformYear}_{1994}$  to negatively and significantly affect Registered Capital. We also expect the interaction effect  $\text{Market Orientation} \times \text{ReformYear}_{1994}$  to negatively and significantly affect Registered Capital. The results in Table 3 supports Hypothesis 1. The main effect of  $\text{ReformYear}_{1994}$  is negative and significant (Model 1:  $p < 0.05$ ). On average and all else equal, firm registered capital after the 1994 Company Law is about 3.5 times lower than before the reform. Moreover, the interaction effect  $\text{Market Orientation} \times \text{ReformYear}_{1994}$  is negative and significant (Model 3:  $p < 0.01$ ). Practically speaking, on average and all else equal, after the 1994 Company Law reform, each unit increase in Market Orientation leads to about a 37% decrease in firm registered capital.

(Table 3 about here)

Hypothesis 2 argues after the 1994 Company Law, founding should increase and more so in more market-oriented provinces. Therefore, we expect that the  $\text{ReformYear}_{1994}$  should positively and significantly affect Founding. We also expect the interaction effect  $\text{Market Orientation} \times \text{ReformYear}_{1994}$  should positively and significantly affect Founding. Interestingly, the results in Table 4 do not support Hypothesis 2. Neither the main effect of  $\text{ReformYear}_{1994}$  nor the interaction effect of  $\text{Market Orientation} \times \text{ReformYear}_{1994}$  are significant.

(Table 4 about here)

Hypothesis 3 argues after the 1998 CAS-KIP reform, founding should increase and more so in those provinces with more local CAS research institutes. Therefore, we expect  $\text{ReformYear}_{1998}$  to positively and significantly affect Founding. We also expect the interaction effect  $\text{CAS} \times \text{ReformYear}_{1998}$  to positively and significantly affect Founding. The results in Table 5 supports Hypothesis 3. The main effect of  $\text{ReformYear}_{1998}$  is positive and significant (Model 1:  $p < 0.001$ ). On average and all else equal, the annual percentage increase in high-tech founding is about 4.1 times more after the 1998 CAS-KIP reform than after the 1994 Company Law reform. Moreover, the interaction effect  $\text{CAS} \times \text{ReformYear}_{1998}$  is positive and significant (Model 3:  $p < 0.05$ ).

Hypothesis 4 argues after the 1998 CAS-KIP reform, founding should increase and more so in those provinces that are both more market-oriented and have more local CAS research institutes. Therefore, besides the main effect of  $\text{ReformYear}_{1998}$  positively and significantly affecting Founding as tested in Hypothesis 3, we also expect that the interaction effect  $\text{MOCAS}_{\text{high}} \times \text{ReformYear}_{1998}$  should positively and significantly affect Founding. The results in Table 5 supports Hypothesis 4. The interaction effect  $\text{MOCAS}_{\text{high}} \times \text{ReformYear}_{1998}$  is positive and significant (Model 5:  $p < 0.05$ ). On average and all else equal, after 1998 CAS-KIP, the annual percentage increase in high-tech founding from provinces with high CAS and Market Orientation levels ( $\text{MOCAS}_{\text{high}}$ ) is about 13% more than provinces with just high CAS levels and about 113% times more than provinces with just high Market Orientation levels.

(Table 5 about here)

We also present descriptive results from plots of the raw data. Figure 1 differentiates registered capital before and after the 1994 Company Law by provinces with more or less market

orientation (median split of Market Orientation). As seen in Figure 1, the average firm registered capital for both more or less market-oriented provinces prior to the 1994 Company Law track closely. This graphically demonstrates the parallel trends assumption necessary for engaging in a DiD approach. Consistent with the statistical results supporting Hypothesis 1, registered capital decreases, particularly in more market-oriented provinces.

(Figure 1 about here)

Figure 2 shows founding before and after the 1994 Company Law. Consistent with the statistical results that do not support Hypothesis 2, there is little observable difference in founding before and after the 1994 Company Law.

(Figure 2 about here)

Figure 3 differentiates registered capital before and after the 1998 CAS-KIP by the provinces with more or less CAS institutes (median split of CAS). As seen in Figure 3, founding for provinces with both more or less CAS institutes prior to the 1998 CAS-KIP track closely. Again, this graphically demonstrates the parallel trends assumption necessary for engaging in a DiD approach. Consistent with statistical results supporting Hypothesis 3, founding after the 1998 CAS-KIP increases, particularly in provinces with more CAS institutes.

(Figure 3 about here)

Finally, Figure 4 differentiates registered capital before and after the 1998 CAS-KIP by both the province's market orientation and the province's amount of local CAS institutes. As seen in Figure 4, prior to the 1998 CAS-KIP, founding trends for provinces that are both more or less market-oriented and with both high and low amounts of CAS institutes track closely. Again, this graphically demonstrates the parallel trends assumption necessary for engaging in a DiD approach. Consistent with statistical results supporting Hypothesis 4, founding after the 1998

CAS-KIP increases, particularly in provinces that are more market-oriented and with more local CAS institutes.

(Figure 4 about here)

### **Robustness Checks and Alternative Arguments**

We ran a series of robustness checks as well as additional tests to rule out alternative arguments (available upon request). First, we used the government efficiency portion of a World Bank institutional effectiveness measure used in prior studies as an alternative to NERI (65). We also used the tax burden portion of this measure (available from authors), which also measures the degree to which governments intervene in markets. These tests produced similar results.

Second, as a confirmatory check to these results, we would expect information technology (IT) firms to especially benefit from these reforms. IT firms were the first technological companies in China to experiment with structuring as private-sector firms, more commonly referred to as “people run companies”. Moreover, CAS researchers established many of these initial companies, one of which was Lenovo (66). Therefore, reforms that lower entry barriers to entrepreneurship (1994 Company Law) and enhance the knowledge transfer from CAS institutes to the market (1998 CAS-KIP) should especially increase the founding of IT firms. When we limit founding to just IT firms, the results support this intuition, providing added confirmation of our intuition regarding these reforms.

Third, though we find evidence that after 1998 CAS-KIP, founding especially increases in more market-oriented provinces with more CAS institutes (Hypothesis 4), this does not necessarily rule out that market orientation or local CAS institutes alone may be sufficient to drive these changes. To address this, we ran additional tests where we recoded  $MOCAS_{High}$ . As before, this variable was coded as 1 if a province was on or above the median in Market

Orientation and CAS. However, we instead coded a province as 0 if it was on or above the median in Market Orientation but below the median in CAS. We also ran another permutation where we coded a province as 0 if it was on or above the median in CAS but below the median in Market Orientation. In both cases, the results for  $MOCAS_{High}$  were similar. Such results provide added evidence that market orientation and the local number of CAS institutes together exhibit greater effects on founding than either of these factors alone.

Fourth, one could argue these results may still be the result of general trends that are occurring, irrespective of these reforms. To test this, we assumed the reform was the year before the actual reform, so we assumed the Company Law occurred in 1993 and the CAS-KIP occurred in 1997. If these arguments are correct, we would expect these tests would also reveal the same significant results. When running this analysis, the results do not hold, suggesting these results are due to these reforms and not general trends or signaling prior to the reform.

Fifth, the results could be merely a Beijing or Shanghai effect. Both have high amounts of CAS institutes and tend to be more market-oriented in comparison to other parts of China. When removing Beijing and Shanghai from the analysis, the results are consistent, indicating the results are less likely driven from Beijing and Shanghai alone.

Sixth, these effects could be driven through self-selection in that firms may simply move to the locations that are more market-oriented and have the most CAS institutes. Here, we can exploit a unique system to China, the hukou (户口) registration system. This system legally requires every resident to register their household in the local district of their birth to be eligible for employment and other social welfare. To control population movement within China (67), this system heavily restricts movement from rural to urban areas and from lower-tier to first-tier cities such as Beijing, Shanghai, and Shenzhen, where infrastructure for high-tech ventures is

better. Given this system, wholly foreign-owned ventures or returnee ventures are the firms with the most unfettered ability to move to locations with more favorable policies. When we remove these groups, the results are consistent, suggesting self-selection is a less likely explanation for the findings.

Seventh, market orientation may simply be a product of economic growth. As local markets increase, market mechanisms may become more necessary simply to coordinate an ever-growing market. If that is the case, then market orientation may not reflect political ideology but merely a more vibrant local market. To test this, we orthogonalized Market Orientation from Investors and from Self-Employ. In this way, we separate out the part of Market Orientation that is not correlated with the vibrancy of the province's market. We also ran additional models where we orthogonalized Market Orientation from  $\ln(\text{GDP/capita})$ , as well as from Investors, Self-Employ, and  $\ln(\text{GDP/capita})$  together (available from the authors). When we performed these analyses, the results were similar. Such findings suggest that the strength of the local economy is a less likely explanation for the effects of market orientation.

Finally, clustering or agglomeration effects may be driving the results. In this manner, some provinces may have clusters that are better suited to support high-tech entrepreneurship than others, irrespective of these reforms, market orientation or CAS institutes. To address this we developed a tech concentration measure that measures the proportion of total high-tech firms founded in a given year that were founded in the province of interest. When we included this measure (available from authors), the results were similar.

## **DISCUSSION**

We began this study by asking: when are lowering entry barriers sufficient for governments to spur firm founding? To investigate this question, we explore two sequential

national reforms in China. The first was the 1994 Company Law, which reduced capital requirements and particularly more so for high-tech firms, thereby lowering barriers to high-tech entrepreneurship. The second was the 1998 Chinese Academy of Sciences Knowledge Innovation Program (CAS-KIP), which restructured the CAS from focusing on science in isolation to better linking its science to market needs. The first institutional change lowered entry barriers, while the second better supplied knowledge resources to local markets. Both of these changes aimed to increase high-tech entrepreneurship.

What we find is that lowering barriers may not be sufficient for starting new firms. When existing resources are inadequate in the market, these policies require complementary changes that supply additional resources for taking advantage of such policies. More specifically, after the 1994 China Company Law, while registered capital requirements did substantially decrease, high-tech founding did not increase. Only after the 1998 CAS-KIP, whereby more knowledge resources were made available through better transfer of CAS scientific knowledge into local markets, did high-tech founding increase. Moreover, we find that the local government is crucial in implementing these policies. More specifically, provinces whose government officials support lowering entry barriers (more market-oriented) and that had more local CAS institutes had the highest increases in high-tech founding.

Our study contributes to institutional theory, particularly the research on institutional change, and its nexus with entrepreneurship. First, we contribute the insight that institutional changes that increase entrepreneurship are multi-faceted – i.e., only lowering entry barriers does not necessarily ensure there exists adequate resources, such as knowledge, to spur entrepreneurship. Prior research on institutional change and entrepreneurship finds that policies that lowering entry barriers spur entrepreneurship (7, 8). Yet, these studies also acknowledge that

existing market institutions were willing and able to provide adequate resources to take advantage of such reforms (8-10, 27).

Our study finds that policies which lower barriers do not necessarily lead to entrepreneurship when existing institutions are unwilling or unable to supply adequate resources. Rather, in such circumstances, other changes are required to supply additional resources to take advantage of such policies. Therefore, the implication of our study's findings is that the mixed effects of entrepreneurship policies on founding may be occurring due to the fact that not all market institutions are willing or able to supply the necessary resources to support such institutional changes.

Second, we contribute the insight that a single institutional change may not be sufficient to reach a desired outcome (i.e., entrepreneurship). Prior research on institutional change usually focuses on a single reform, within a single institution, and at a single level of analysis. For example, a set of studies looks at a single type of reform and how it is shaped at the local level (7, 68, 69). Another set of studies looks at a single type of reform and how it is shaped at the national level (13, 14). A third set of studies focuses on policy implementation, rather than policy creation or adoption, by examining how national government agencies implement a single type of reform (70). The few studies that look across levels, such as national and local levels (11, 71), examine a single type of reform, and do not compare changes before and after the reform takes place.

In contrast, by analyzing a sequence of two policies, our study shows that altering the market environment enough to translate policy into founding may require a series of incremental policy efforts. Moreover, these changes may require reforms across different institutions (CAS institutes and local governments) and across multiple levels (local and national). To our

knowledge, these findings provide the first empirical support for the theoretical argument that public policies more successfully change markets when they rely on a series of more gradual changes rather than one drastic change (72).

Finally, we contribute the insight that national-level institutional change depends upon the willingness and capacity of local institutions to enact those changes. In institutional theory, regulations plays a central role in clarifying and lending credibility to markets (73, 74). For these reasons, prior research focuses on the changes that regulations make to markets (8). In particular, prior research focuses on how changes result from the ways in which national policies are enacted (13, 14); and in how these changes (or lack thereof) are the result of the ways in which policies are locally implemented (11, 69). However, this prior work does not examine how institutional support varies across levels of analysis (i.e. national and local), across institutions (i.e. CAS and government), and over a sequence of institutional changes. In particular, our study shows that local government's alignment with the focal reform (willingness) and the ability to supply sufficient resources (capacity) influences the degree to which national policy can alter local markets. In so doing (and to our knowledge), this study is the first to document how institutional changes are driven from interactions across "multiple levels of government" (75, p. 196).

In terms of public policy implications, our study shows the "policy relevance of organizational and institutional theory" (76, p. 277). Previous studies show national policies in federalist societies, whether around upgrading industries or improving the sustainability of natural resources, are better implemented when local governments are both willing and able to supply technical knowledge in support of such policies (77-79). For example, in the Argentine wine industry, policies aimed at helping firms upgrade their wine products were more effective

when firms had more ties to local government sources of viticulture knowledge, and when local officials believed in creating market changes through reforms that more tightly linked public sources of knowledge to markets (31).

Our study extends these prior policy analyses by showing that in order to have the desired policy impact, some outcomes require a sequence of reforms, across multiple institutions, and across multiple levels of government. Prior policy analyses typically focus on just a single institution and on a single level of government (either at the national or local level). However, policy changes rarely happen in isolation and often, subsequent reforms are created to address the limitations of prior reforms. Moreover, for complex outcomes, such as innovation and entrepreneurship, multiple institutions may be required. We are able to demonstrate this insight because our study focuses on a sequence of two policies, rather than just a single policy. In particular, we find that only when policies that lower entry barriers (i.e. reduced minimum capital requirements) are combined with reforms that restructure CAS institutes to better supply public knowledge to markets did we see a substantial influence of public policy on entrepreneurial founding. Moreover, we find these national policy reforms are more likely to be implemented if local governments are both willing (are more market-oriented) and able (have more local CAS institutes) to supply the resources needed for entrepreneurs to exploit such policies.

Therefore, our overall policy implication is that additional policies, across multiple institutions, may be necessary to attain the outcomes intended from prior policy changes. Furthermore, we show that to more completely understand the effects of a policy on its intended target, one may actually need to analyze a sequence of policies rather than a single policy of interest. In so doing, we bring institutional theory to public policy research so as to conduct a

more comprehensive analysis that can better inform policymakers how to more effectively implement public policies.

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**Table 1 Correlation matrix for registered capital analysis**

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Ln(Registered Capital)	6.13	1.72	1.00									
2. Reform <sub>1994</sub>	0.50	0.50	-0.10	1.00								
3. Market Orientation	3.15	1.02	0.01	0.40	1.00							
4. Wholesale	0.14	0.35	-0.01	-0.00	0.09	1.00						
5. Manufacturing	0.85	0.36	0.10	0.00	0.08	0.04	1.00					
6. Retail	0.11	0.31	-0.04	-0.00	0.06	0.64	0.01	1.00				
7. Province Name	0.14	0.35	-0.06	-0.00	-0.11	0.07	0.02	0.04	1.00			
8. City Registration	0.22	0.42	0.14	-0.00	0.03	0.00	0.13	-0.03	-0.19	1.00		
9. Province Registration	0.09	0.28	0.13	-0.00	-0.08	0.04	0.06	0.00	0.22	-0.12	1.00	
10. Group	0.20	0.40	0.14	-0.00	0.00	0.01	0.10	0.01	0.00	0.04	0.06	1.00
11. Holding	0.38	0.48	-0.08	-0.00	-0.09	0.01	-0.09	0.06	-0.24	-0.08	-0.09	-0.00
12. Stock-Limited	0.11	0.32	0.26	-0.00	0.02	-0.01	0.08	0.00	-0.05	0.14	0.23	0.07
13. Listed	0.03	0.17	0.23	-0.00	0.03	0.00	0.06	0.01	-0.04	0.04	0.17	0.05
14. Foreign	0.10	0.30	0.17	-0.00	0.03	0.04	0.05	-0.07	0.08	0.07	0.11	0.04
15. HK	0.08	0.26	0.07	0.00	0.14	0.02	0.06	-0.06	0.01	0.11	0.06	0.03
16. Collective	0.00	0.05	-0.09	0.00	-0.03	-0.02	0.01	-0.01	0.01	-0.02	0.00	-0.01
17. Investors (10,000 people)	4.23	4.36	-0.00	0.43	0.87	0.06	0.10	0.04	-0.12	0.08	-0.05	0.02
18. Self-Employ (10,000 people)	146.68	107.56	0.04	0.26	0.50	0.04	0.20	0.03	-0.42	0.21	-0.09	0.04
19. Ln(GDP/capita)	8.50	0.64	-0.12	0.39	0.29	-0.04	-0.19	-0.06	0.41	-0.21	-0.01	-0.04
20. Ln(VarRegCap)	10.09	6.62	0.12	-0.01	0.11	0.02	0.03	-0.01	-0.04	0.04	0.08	0.07
21. Data Sources	2.44	0.79	0.04	0.00	0.04	0.01	0.13	-0.02	-0.20	0.20	0.01	0.03

	11	12	13	14	15	16	17	18	19	20	21
11. Holding	1.00										
12. Stock-Limited	-0.03	1.00									
13. Listed	-0.02	0.50	1.00								
14. Foreign	-0.21	-0.04	-0.03	1.00							
15. HK	-0.18	-0.01	-0.00	-0.06	1.00						
16. Collective	-0.04	-0.02	-0.01	-0.02	-0.01	1.00					
17. Investors (10,000 people)	-0.13	0.03	0.04	0.01	0.12	-0.02	1.00				
18. Self-Employ (10,000 people)	-0.04	0.08	0.06	-0.06	0.03	-0.02	0.59	1.00			
19. Ln(GDP/capita)	-0.05	-0.07	-0.04	0.09	0.04	0.00	0.24	-0.34	1.00		
20. Ln(VarRegCap)	-0.09	0.13	0.15	0.10	0.12	-0.04	0.09	0.07	-0.01	1.00	
21. Data Sources	0.18	0.07	0.04	-0.01	0.02	-0.02	0.09	0.32	-0.23	-0.06	1.00

**Table 2 Correlation matrix for founding analysis (top-1992-1995, bottom 1996-1999)**

	Mean	S.D.	1	2	3	4
1. Ln(Founding, Population Normalized)	0.59	0.65	1.00			
2. Reform <sub>1994</sub>	0.50	0.50	0.01	1.00		
3. Market Orientation	2.59	1.06	0.40	0.31	1.00	
4. Self-Employ (10,000 people)	121.36	99.87	-0.07	0.27	0.50	1.00

	Mean	S.D.	1	2	3	4	5
1. Ln(Founding, Population Normalized)	0.73	0.70	1.00				
2. Reform <sub>1998</sub>	0.50	0.50	0.12	1.00			
3. CAS	3.80	6.80	0.66	0.00	1.00		
4. MOCAS <sub>High</sub>	0.29	0.45	0.52	0.00	0.49	1.00	
5. Self-Employ (10,000 people)	198.31	163.27	-0.13	0.10	-0.16	0.09	1.00

**Table 3 OLS regressions on ln(registered capital)**

	Controls	Model 1	Model 2	Model 3
Intercept	-3.40 (5.57)	-3.40 (5.57)	-3.27 (5.39)	-6.80 (5.20)
Wholesale	0.10 (0.17)	0.10 (0.17)	0.10 (0.17)	0.10 (0.17)
Manufacturing	0.33 <sup>†</sup> (0.18)	0.33 <sup>†</sup> (0.18)	0.33 <sup>†</sup> (0.18)	0.31 <sup>†</sup> (0.18)
Retail	-0.16 (0.24)	-0.16 (0.24)	-0.15 (0.24)	-0.16 (0.24)
Province Name	0.07 (0.23)	0.07 (0.23)	0.08 (0.23)	0.06 (0.23)
City Registration	0.35 <sup>†</sup> (0.19)	0.35 <sup>†</sup> (0.19)	0.35 <sup>†</sup> (0.19)	0.35 <sup>†</sup> (0.19)
Province Registration	0.32* (0.14)	0.32* (0.14)	0.32* (0.14)	0.32* (0.14)
Group	0.46*** (0.05)	0.46*** (0.05)	0.46*** (0.05)	0.46*** (0.05)
Holding	-0.21 <sup>†</sup> (0.12)	-0.21 <sup>†</sup> (0.12)	-0.21 <sup>†</sup> (0.12)	-0.20 (0.12)
Stock-Limited	0.79*** (0.14)	0.79*** (0.14)	0.79*** (0.14)	0.78*** (0.13)
Listed	0.84** (0.28)	0.84** (0.28)	0.84** (0.28)	0.83** (0.28)
Foreign	0.76*** (0.17)	0.76*** (0.17)	0.76*** (0.17)	0.76*** (0.16)
HK	0.28 (0.22)	0.28 (0.22)	0.28 (0.22)	0.27 (0.21)
Collective	-0.93* (0.40)	-0.93* (0.40)	-0.93* (0.40)	-0.95* (0.41)
Investors	0.00 (0.02)	0.00 (0.02)	-0.00 (0.02)	0.07** (0.02)
Self-Employ	-0.00** (0.00)	-0.00** (0.00)	-0.00* (0.00)	-0.00** (0.00)
Ln(GDP per capita)	1.31 (0.77)	1.31 (0.77)	1.25 <sup>†</sup> (0.73)	1.85* (0.73)
Ln(VarRegCap)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Data Sources	-0.07 (0.15)	-0.07 (0.15)	-0.07 (0.15)	-0.07 (0.15)
ReformYear <sub>1994</sub>		-1.25* (0.54)	-1.39 <sup>†</sup> (0.73)	-0.61 (0.72)
Market Orientation			0.14 (0.31)	-0.17 (0.31)
ReformYear <sub>1994</sub> x Market Orientation				-0.29** (0.08)
Industry Effects	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes
Province Effects	Yes	Yes	Yes	Yes
N	1748	1748	1748	1748
R <sup>2</sup>	0.18	0.18	0.18	0.18

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, †p<0.10 (two-tailed), errors clustered around province

**Table 4 Panel-OLS regressions on ln(founding, population normalized)-1994 Company Law**

	Controls	Model 1	Model 2	Model 3
Intercept	0.26*** (0.04)	0.27*** (0.04)	-0.19 (0.26)	-0.25 (0.30)
Self-Employ	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
ReformYear <sub>1994</sub>		0.04 (0.05)	-0.10 (0.08)	-0.06 (0.10)
Market Orientation			0.21 <sup>†</sup> (0.11)	0.23 <sup>†</sup> (0.13)
Market Orientation*ReformYear <sub>1994</sub>				-0.02 (0.04)
Year Effects	Yes	Yes	Yes	Yes
Province Effects	Yes	Yes	Yes	Yes
N	<b>112</b>	<b>112</b>	<b>112</b>	<b>112</b>
R <sup>2</sup>	<b>0.15</b>	<b>0.17</b>	<b>0.21</b>	<b>0.22</b>

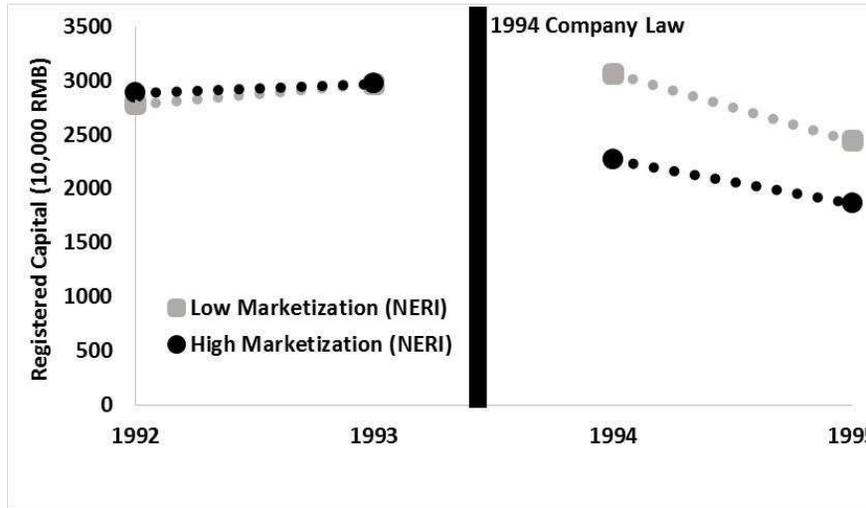
\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, †p<0.10 (two-tailed), errors clustered around province

**Table 5 Panel-OLS regressions on ln(founding, population normalized)-1998 CAS-KIP reform**

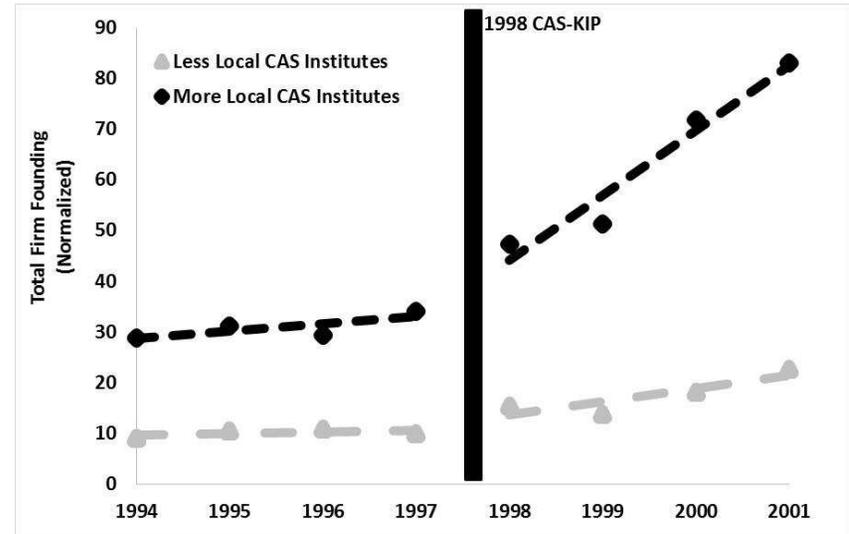
	Controls	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.17 (0.13)	0.42** (0.14)	-0.04 (0.15)	0.76* (0.34)	0.42** (0.14)	0.45** (0.14)
Self-Employ	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
ReformYear <sub>1998</sub>		0.19*** (0.05)	0.17*** (0.05)	0.11† (0.06)	0.19*** (0.05)	0.15** (0.05)
CAS			0.41*** (0.04)	-0.38 (0.33)		
CAS* ReformYear <sub>1998</sub>				0.02* (0.01)		
MOCAS <sub>High</sub>					0.20 (0.18)	0.14 (0.17)
ReformYear <sub>1998</sub> *MOCAS <sub>High</sub>						0.15* (0.06)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Province Effects	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	<b>112</b>	<b>112</b>	<b>112</b>	<b>112</b>	<b>112</b>	<b>112</b>
<b>R<sup>2</sup></b>	<b>0.22</b>	<b>0.45</b>	<b>0.54</b>	<b>0.59</b>	<b>0.45</b>	<b>0.53</b>

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, †p<0.10 (two-tailed), errors clustered around province

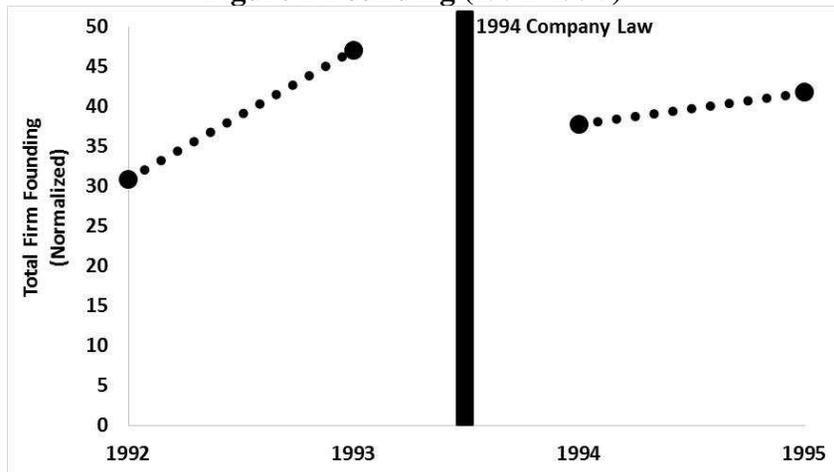
**Figure 1 Registered capital by provincial market orientation (1992-1995)**



**Figure 3 Founding by number of provincial CAS institutes (1994-2001)**



**Figure 2 Founding (1992-1995)**



**Figure 4 Total provincial founding by number of provincial CAS institutes and market orientation (MO) (1994-2001)**

