

How law, politics and transnational networks affect technology entrepreneurship: Explaining divergent venture capital investing strategies in China

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Abstract This article identifies three distinct patterns of investment behavior by venture capital firms investing in technology sector start-ups in China. The first pattern is the service-oriented, technology-light investment behavior exhibited by the foreign venture capitalist firms not founded by ethnic Chinese. The second pattern is the technology creation investment pattern exhibited by foreign firms founded by ethnic Chinese and embedded in ethnic Chinese communities. The third pattern consists of local state-funded Chinese venture capital firms that choose either to invest in state-directed projects or opt out of investing in technology start-ups entirely. What explains the differences in behavior between the strictly foreign and the ethnic Chinese-embedded foreign firms are the different legal environments in which these firms honed their skills. The different learned experience gained from operating in different environments explains why the foreign firms avoid investing in technology-generating activities in China whereas the ethnic Chinese firms are willing to do so despite China's notorious weak intellectual property rights regime. The political factors influencing the distribution of finance in China explain the behavior and essential failure of the local state-run venture capital firms. These findings demonstrate that several distinct, separate and non-clashing institutional arrangements are concurrently operating within China and shaping the behavior of venture capital firms there.

Keywords China · Venture capital · Technology · Technology development · Rule of law · Political economy

The motivation of this study is to identify and explain any differences in investment selection behavior by venture capital firms operating in China. This article identifies three distinct patterns of investment behavior by venture capital (VC) firms investing

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in technology sector start-ups in China. The level of analysis is the VC firm not the individual venture capitalist.¹ The first pattern is the service-oriented, technology-light investment behavior exhibited by the foreign venture capitalist firms not founded by ethnic Chinese. The second pattern is the technology creation investment pattern exhibited by foreign firms founded by ethnic Chinese and embedded in ethnic Chinese communities. In this article, these firms will be called ethnic Chinese foreign (ECF) venture capitalist firms to differentiate them from the other foreign VCs. The third pattern, exhibited by domestic Chinese VC firms, is either to invest in state-directed projects or opt out of investing in technology start-ups entirely.

This article's main contribution is to provide a new conception of the diversity of critical institutional arrangements within emerging economies. To wit, emerging economies may have several distinct and generally separate institutional settings operating within their geographic boundaries and these separate sets of institutions will cause those firms under their influence to behave quite differently from firms operating within the same geographic boundaries but under the influence of a different set of institutions. In the case of China, the government dominates one set of institutional arrangements while foreign firms through FDI link their Chinese activities to a set of more market-based institutions located offshore. The different learned experiences of the ECF and foreign VCs further differentiate their behavior under the influence of these offshore, market-based institutions. Using the venture capital industry as a case, this article documents how different VC firms operate within the same geographic space under these distinct different institutional settings within the same geographic space that differentiate their investment behavior.

In line with the findings of previous research that institutional environments shape the behavior of VCs (Bruton & Ahlstrom, 2003), this article emphasizes the role of formal and informal institutions that constrain and enable various types of economic activity and behavior (Garud & Jain, 1996; North, 1990). What explain the differences in behavior between the foreign VCs and the ECF VCs are their differing learned experiences derived from the different legal environments in which these two types of firms honed their investment skills. Foreign VCs gathered extensive prior experience in economies where formal property rights protection was well developed whereas the ECF VCs accumulated extensive prior experience in investing in economies with limited and weak formal property rights protection. This difference explains why the foreign firms avoid investing in technology-generating activities in China whereas the ECF VCs are willing to do so despite China's notorious weak intellectual property rights (IPR) regime. The political factors influencing the distribution of finance in China explain the behavior and essential failure of the domestic Chinese VCs.

For each type of VC, national institutions of their respective home economies have influenced their investment behavior in China. The home economy or economies for ECF firms are best conceived as those markets in which these firms have been active for a long time. Saxenian (2006) has documented how these ECF VCs are active in a number of economies which share a transnational community of ethnic Chinese technologists. While some of these countries, such as the US, have very strong formal market-governing institutions, including IPR protection, the

¹ For the rest of the article, VC firms and VCs will be used interchangeably. People engaged in the business of venture capital will be referred to as individual venture capitalists.

ECFs are also very active in economies that lack such institutions and the ECF have learned how to develop informal mechanisms to succeed in these environments.

In sum, the three factors of politics, transnational networks and law shape investment behavior by VCs in China. The foreign and ECF VCs share a common advantage over the domestic Chinese VCs of not being enmeshed in the politically driven financial system. Avoiding this system frees them from the pitfalls in access to finance and political interference in investment decision-making that hinders and constrains their Chinese counterparts' investment choices. The transnational nature of the ECF VCs led them to invest actively in ethnic Chinese economies, such as Taiwan, before it became popular to do so. The transnational networks of the ECF VCs thus led them to acquire learned experience of how to operate in economies with relatively low degrees of formal institutionalization of the law while the mainstream foreign VCs were still largely operating in the developed world where formal rules of law were strong. This experience equipped the ECF VCs with the confidence in informal mechanisms to protect IP that allowed them to pursue bolder, more innovative investments in China than their foreign counterparts, alarmed by China's deficient legal system, were willing to contemplate.

Literature review

This article addresses several strands of literature on the behavior of VC firms while making significant conceptual departures from the extant literature.

Previous work in this area suggests that VC firms respond to different institutional environments for VC when moving from advanced to emerging economies, particularly China (Bruton & Ahlstrom, 2003). This article departs from the previous literature by arguing that venture firms within China interact with one of two very different and generally separate institutional systems (Scott, 1995) based upon their relational proximity to the state. Previous research about VC and entrepreneurship in China often assumes that due to China's transitional nature, there is a conflict between two institutional systems, socialism and capitalism (Bruton & Ahlstrom, 2003; Peng, 2003; Tan & Tan, 2004), and this conflict causes such confusion that entrepreneurial firms often cannot capitalize on some business opportunities (Bruton & Ahlstrom, 2003; Peng, 2003; Tan & Tan, 2004; Tang, Tang, Marino, Zhang, & Li, 2008). This study argues that instead of inherent conflict between these two institutional systems, there is actually institutional separation although not on the neat socialist and capitalist divide envisioned in these earlier works. Instead of socialist and capitalist systems at loggerheads over the same institutional terrain, today there are two partially overlapping but mainly separate institutional systems, the one in which pervasive government influence shapes the marketplace and the one where foreign institutions, accessed via various offshore financial arrangements and brought onshore via foreign direct investment (FDI), hold sway. Thus, the government interference in the economy that many correctly noted in previous studies (Peng & Luo, 2000) is still there and still often unpredictable (Peng, 2001), but today this pervasive government role in the economy is in one of the two institutional systems that potentially impact firms' behavior. China's transition has led not to a full-fledged market economy but to two divergent outcomes. On the one

hand, there is an economy where the state still contorts the marketplace and thus distorts markets (Huang, 2003, 2008). This is the system under which the domestic VCs operate. On the other, there is a market-based institutional system² located in institutions offshore that has allowed a set of foreign VCs, ECF VCs and, indirectly, their investment targets to rely on foreign institutions through offshoring their corporate governance and financial arrangements and thus do an end-run around the main, state-dominated system (Fuller, 2005, 2009a, b).

The existence of these two parallel and only partially overlapping systems has several implications. First, the strategies for success are different under the two institutional systems. Under the government-dominated one, it is important to curry favor with the government in order to grow through access to government finance and procurement. In the offshore system, honing capabilities that allow firms to compete effectively in the open marketplace are critical. Second, a high level of entrepreneurial orientation (EO) as defined in the EO literature as focusing on high-risk and innovative projects (see Tang et al., 2008) will not necessarily lead to problems for high EO firms since such an orientation is compatible with the offshore institutional system that rewards high levels of EO even though high EO conflicts with the main government-dominated system. Third, fostering strong relations with the government is no longer necessary as there is a viable alternative to accessing finance and relying on government finance can actually be harmful. The data presented in this article suggests that the VC firms closest to the government are actually hindered in many ways from making effective and appropriate business decisions in a manner that echoes previous studies (Bruton & Ahlstrom, 2003; Peng, 2003; Tan & Tan, 2004; Tang et al., 2008) that suggested that high EO firms have difficulty in China's mixed economy due to the clashing institutional influences. Here connections or *guanxi* becomes a negative, constraining influence in contrast to the previous conception of government *guanxi* as an ameliorative, positive influence helping to overcome market uncertainties in an environment with incomplete market institutions (Baron & Tang 2009; Park & Luo, 2001). This implication is similar to the warning by Ahlstrom, Bruton, and Yeh (2007) that good government *guanxi* is not enough to be successful, but goes further in arguing that government *guanxi* itself may be dangerous as it may constrain firms from honing their skills to compete in the competitive markets free from too much government meddling. Fourth, even the effects of *guanxi* with professional networks of suppliers, customers and others industry participants depend upon the quality of these network participants, which in turn depends partially on the institutional system within which these industry participants operate. The private *guanxi* networks interacting with the offshore institutional system should be more conducive for the growth of high EO and other market-oriented firms than the *guanxi* networks involved with the government-dominated institutional system (Fuller, 2005, 2009a, b).

² One could argue that there are in fact two separate market-based institutional systems if one incorporates the different learned experience of the ECF and foreign VC firms into the institutional systems, but for clarity's sake, this article will refer to two systems (one government-dominated and the other market-based) with prior learned behavior differentiating how ECF and foreign VCs behave in the market-based system.

This implication about the importance of quality of the *guanxi* network dovetails with the findings of Saxenian and Hsu (2000) that the networks in the technology sector in ethnic Chinese communities do not resemble traditional *guanxi* networks based solely on cultivated and reciprocal relationships. Saxenian and Hsu (2000) argue that ethnic Chinese technology networks are based upon technical expertise as much as reciprocity and simply knowing members of such networks well does not allow one to gain entry into these networks. In these technology networks, the network's value is derived from the quality of the technical expertise of other members and members are cognizant of this fact. These new conceptions of *guanxi* suggest that ECF and foreign VCs will benefit from quality *guanxi* networks while domestic VCs will be hurt by their *guanxi* with the Chinese state. The findings in this article of poor investment outcomes in terms of investing in high EO firms on the part of domestic firms and the larger number of high EO investments on the part of foreign and ECF VCs are suggestive of this quality differential in *guanxi* networks being important. Another possibility is that these new technology-intensive *guanxi* networks are dense, but the typical *guanxi* networks are not so rich and dense. Recent literature provides some evidence that *guanxi* networks in China are not as dense and important as previously thought (Ren, Au, & Birtch, 2009). The new conception of quality *guanxi* based upon shared technical expertise also suggests that close *guanxi* between parties within the same firm may not create the negative externalities for the firm suggested in the recent literature (Chen & Chen, 2009). Indeed, such technically-based personal ties may be the basis for the cooperation necessary to pursue innovation in high-technology firms.

VC organizations in emerging economies are often broken down into typologies. Wright (2007) conceived of VC firms in China and other emerging economies as being one of four types that can be placed in a 2×2 matrix with independent versus captive on one axis and foreign versus domestic on the another. White, Gao, and Zhang (2005) instead had a typology dividing the VC firms into foreign firms, government firms, university firms and corporate firms. Both of these typologies at least implicitly assume that foreign firms will behave in a similar manner to one another. The logic behind this assumption is one developed from a line of research on VC firms in emerging economies (Bruton & Ahlstrom, 2003; Bruton, Ahlstrom, & Yeh, 2004; Lockett, Wright, Sapienza, & Pruthi, 2002; Wright, Lockett, & Pruthi, 2002) that suggests that foreign VCs are used to operating in more formal, institutionalized settings so they need to adjust to the lack of formal market-governing institutions in emerging economy settings. The principal means by which these VC firms succeed in these less institutionalized settings is through social networks and some reliance on culturally specific knowledge (Batjargal & Liu, 2005; Bruton et al., 2004; Lockett et al., 2002; Wright et al., 2002). This article amends this assumption by uncovering two distinct types of foreign VC firms that behave quite differently in selecting investment targets. The differences between the ECF and foreign VCs suggests that the foreign VCs are actually rather limited in their ability to adapt to local environments in contrast to the claims of prior works (Bruton et al., 2004; Lockett et al., 2002; Wright et al., 2002, 2004). The difference in behavior is located at the level of the organization rather than the level of the individual venture capitalist because the venture capitalists across the two types of foreign VC firms are quite similar: ethnic Chinese returnees from abroad utilizing

the same social networks in China.³ The learned behavior of these two types of firms is different because their past investment successes are different. This distinction will be explained in detail further on in this article.

This article also challenges the assumption of White et al. (2005) that university-based VC firms and even some corporate-based VC firms are clearly differentiated in their behavior from government VC firms. Inside and outside of China, scholars have documented the problems state agents face in managing VC firms (Knockaert, Lockett, Clarysse, & Wright, 2006; Wright, 2007). They often fail to add value and in China's case have often via their investments subsidized non-viable activities rather than creating solutions to market failures (Wright, 2007). In China, many nominally non-state VC organizations suffer from the same maladies precisely because institutionally they actually face the same constraints that state VCs do or are even effectively state-owned and run organizations. This quasi-governmental nature of nominally non-governmental VCs is particularly true of the university-based VC firms as the universities themselves are government organizations.

Finally, while acknowledging the insights of the literature on perceptions of entrepreneurs as influencing the investment decisions of venture capitalists and others, this article argues that in the case of China structural issues constraining behavior for each type of VC firm defined above trump these other considerations. Thus, while the perceived entrepreneurial passion (Elsbach & Kramer, 2003) or preparedness of entrepreneurs in making their pitch to venture capitalists (Chen, Yao, & Kotha, 2009) may play a role in influencing the investment decision-making processes of venture capitalists or VC firms, the differing institutional constraints on the three types of VC firms operating on China will loom larger in shaping the patterns of investment than these perceptions of individual entrepreneurs by individual venture capitalists.

Research methodology

This article employs the grounded theory approach to data gathering and analysis of institutions (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990). While other social sciences have used the grounded theory approach extensively, only recently has it been employed in organizational studies (Lee, 1999; Ahlstrom et al., 2007). The purpose of this approach is to explore social phenomenon in order to build theory. Theory building encompasses a range of analytic tasks including concept creation, identifying causal relationships and patterns of behavior. The qualitative grounded theory approach provides opportunities to create new understandings rather than a method to provide rigorous, empirical testing of existing theories, an area where various quantitative methods may be more useful. Arguably, at this juncture, exploring entrepreneurship in emerging economies like China's to build theory is the most important task at hand as Bruton, Ahlstrom, and Obloj (2008) note that most of literature on entrepreneurship in emerging economies has addressed testing established theories rather than advancing theory development. The conclusion will discuss the next steps to provide an empirical test for the phenomena described in this article.

³ Among all the individual venture capitalists from ECF and foreign VCs interviewed, only one was not an ethnic Chinese returnee.

To acquire an understanding of VC investment in the technology sector in China, the author conducted semi-structured interviews with venture capitalists from 24 foreign and domestic VC firms active in China between 2003 and 2007. These interviews were quite evenly distributed with nine domestic, nine EFCs and six foreign VC firms interviewed. Additional data was provided by over 300 additional interviews with technology firms active in China and Chinese government officials and academics between 1998 and 2008 as part of ongoing research on technological development in China. Interviews were conducted either in Mandarin Chinese or English.

In this article, VC is defined narrowly as the early stages of equity investment as opposed to latter stage mezzanine, turnaround and buyout investments typically associated with private equity investment in the West (Ahlstrom et al., 2007). Although the objective of the research was to interview VC firms and eschew investigating private equity firms, among the domestic Chinese firms often little differentiation was made between these two types of activities. Thus, the interview subjects included domestic firms involved in private equity. Foreign investment firms that more closely resembled private equity firms were excluded. Similarly, this study excludes state-run incubators that undertook equity investments in their incubatees. However, many of the findings of the inefficacy of the state-run VCs apply to the state-run incubators as well.

Both independent (generally organized as limited partnerships) and captive VCs (owned by larger corporate entities) were examined. On the foreign side, the captive VCs in this study arguably are better described as semi-captive. Wright (2007) correctly points out that the emergence of these semi-captive VCs where the VC unit is still a subsidiary of a larger corporate entity at the same time that executives are remunerated based on their investment performance is a significant phenomenon. In this study, there are two such semi-captive foreign firms and there are not any strictly captive ones. On the domestic Chinese side, two firms are semi-captive. The majority of domestic firms in this study are state-run investment vehicles so one might argue that they are captive to larger state entities, such as the municipal government, but they are not part of larger corporate entities in the way captives elsewhere in the world are.

Findings

Taking Wright's (2007) suggestion that more research needs to be done into domestic firms and foreign captive ones in order to build upon the work of Ahlstrom et al. (2007), the research for this article originally intended to be an investigation of the 2×2 matrix of VC organizations with a domestic versus foreign variable on one axis and independent versus captive on the other (Wright 2007). However, the research uncovered a far more powerful matrix for analyzing VC behavior towards investment in technology-intensive firms in China than those offered by Wright (2007) or White et al. (2005). The foreign and domestic axis remains in this new matrix, but the captive versus independent matrix is replaced with the presence or absence of embeddedness in the ethnic Chinese community. Here embeddedness of a given VC in the ethnic Chinese community is defined by two characteristics: (1) the

founders of the firm are ethnic Chinese and (2) the firm has been active in investing in Mainland China or the ethnic Chinese economies (ECEs), which are defined here as Taiwan and Singapore in addition to the special administrative regions (Hong Kong and Macao) of the People's Republic of China, since the VC's inception. This 2×2 matrix yields only three possible outcomes as the domestic firms are embedded in the ethnic Chinese community. The assumed embeddedness of the domestic firms is not just a logical deduction. The empirical research behind this study did not uncover a single domestic firm that did not meet both criteria for embeddedness in the ethnic Chinese community as defined above.

The main finding was the dramatic difference in the number of investments in technology-intensive start-ups among the three types of VCs. Technology-intensive start-ups are those start-ups that aim to create products (both tangible and intangible) embodying a significant amount of technology knowledge and skills. These firms depend on their technical skills to differentiate their products in order to ensure firm survival and success. Given that China is still a developing country, these technical skills are not necessarily cutting edge ones, but given prevailing wage rates they do not have to be. However, these firms are worthless without their core engineering teams. Contrasting with these technology-intensive firms are start-ups trying to compete on their business models or service ideas. These technology-light firms are not trying to compete on the basis of the strength of their technical teams, but rather use other strategies for firm survival. On the one hand, there are commercially oriented start-ups trying to be first to market with a certain business model or service new to China or at least slightly differentiated from what is already on the market. On the other hand, there are start-ups trying to survive by taking advantage of connections to the state to feed at the trough of state procurement.

Several general criteria were used to differentiate the technology-intensive firms from technology-light firms. Firms were considered technology-intensive firms if these firms created new tangible products in-house with the production (as opposed to sales or other ancillary functions) requiring the employment of university-educated engineers as the majority of employment measured either in terms of total wages or total employment headcount. Fabless integrated circuit (IC) design houses, of which there are many VC-invested ones in China, are an example of this type of firm. Firms creating new intangible products broadly defined to include design services for others with the same employment profile as above were also considered technology-intensive. Software service firms are one example of this type of firm. Although there is a common misconception that software service firms are not technology-intensive, the experience of India where offshoring of this type of work has a relatively long history suggests that these firms have technical skills as an essential component of their business survival and success (Dossani & Kenney, 2007). Firms considered to be technology-light were those firms where they met neither of the above criteria, either by not producing technology-based products and services at all, or not using sufficient engineering resources relative to the firm in doing so.

The research for this article did not involve investigating every target firm invested by one of the interviewed VCs to see if they matched these criteria. Rather, the determination of whether or not the invested firm was technology-intensive was

made by judging whether or not the target firm matched the profile of firms likely to meet the above criterion. Thus, a VC-invested call center would not fit either of the above profiles of technology-intensive firms as a large body of engineers would not be necessary to service calls. On the other hand, a VC-invested fabless design house would fit the profile of a technology-intensive firm given the high likelihood of the firm employing large numbers of engineers (relative to the number of the firm's employees) to produce its products. These profiles are not simply based on some assumed deductive logic, but are based on empirical observations of Chinese technology firms based on the more than 300 interviews within the technology sector mentioned in the introduction.

The information about which target firms VC firms invested in is drawn from the interviews as well as from an update done from searching the websites of the VC firms for the foreign and the domestic VCs conducted on May 1 and 2 of 2008. The VC firms with which the author had most recently conducted interviews, all of which fell into the ECF category, were not updated at this time. The number of technology-intensive firms in which the firms invested for each category of VC firm is presented in the Table 1. As is evident, the ECFs were most oriented towards investing in technology-intensive, the foreign VCs were moderately interested and the domestic VC firms were the least interested in making such investments. For the domestic Chinese VCs, the number in parentheses in the total represents an additional estimate of 100 additional non-technology-intensive, even non-commercially viable investments that an interview subject claimed that one municipality-controlled fund had made through six state-run VC firms.

Causation: Learned mechanisms to protect property rights and the political allocation of capital

The foreign VCs and ECF VCs both drew on international capital rather than domestic Chinese capital for their funds and sometimes from the very same countries, such as the biggest source of VC, the US (Saxenian, 2006). Nevertheless, there is a very important distinction between the two types of firms. The foreign firms not embedded in the transnational ethnic Chinese networks have not had a lot of exposure to investing in markets where the formal protection of property rights, intellectual property (IP) rights in particular, has been poor whereas the ECF VCs, even those based outside of the ethnic Chinese economies (ECE), have had lots of exposure to such markets, especially Taiwan (Saxenian & Li, 2003).

Table 1 Technology-intensive investments.

Type of venture capital firm	Ethnic Chinese foreign-invested	Foreign-invested	Domestic Chinese
Number of technology-intensive investments	48	44	16
Total number of investments	79	166	130 (230)

While Taiwan's protection of IP has improved in recent years, it was not so long ago that the firms that led Taiwan's technological development had to develop their own private mechanisms to provide assurance to their customers that IP would not be stolen (Fuller, 2008). Indeed, even today Taiwan's IP protection is not nearly as good as the Triad countries, such as the US and Japan (see Table 2). From operating in Taiwan and other ECEs, the ECF VC firms were able to learn about informal mechanisms to protect their own IP and more importantly the IP of their invested firms. Thus, they have been much more willing to invest in technologically intensive firms than those foreign VCs still relying on the formal legal regimes to protect property rights in countries where the formal regimes were weak. What has been somewhat true for Taiwan has been even truer for China. China's record of IP protection has been dismal (Dam, 2006) given the failings of its formal legal regimes as seen in Table 2. Thus, only VC firms comfortable with dealing in such an uncertain legal environment would invest in firms where IP creation was a major part of the business.

Thus, it is not surprising to find that the ECF VCs demonstrated a propensity to invest in firms that wanted to compete on terms of technology creation, occasionally even on globally new technologies, in China despite its poor legal environment. While these firms did not reject investment in service-oriented firms that were technologically light, they put at least an equal or even stronger emphasis on investing in technology creating firms. One VC even described this as the "two-less" strategy referring to fabless design houses and wireless technology. The latter often meant wireless services, but there was some distinction as the ECFs were more willing to consider investing in firms creating wireless equipment than the other foreign VCs, which were mainly interested in investing in wireless services. These ECF VCs claimed to have made similar investments in earlier years in places like Taiwan when the conventional wisdom was that Taiwan was too far behind to catch up and too lawless in terms of IP protection to progress successfully and profitably in technology creation. They tended to view China as having a very similar environment to Taiwan and the rest of emerging Asia in the 1980s and 1990s. In other words, they believed whatever institutional obstacles China presented to technology development could be overcome.

Furthermore, the interviewed ECF VCs explained how there are well developed informal mechanisms to protect IP, mechanisms honed in Taiwan. For example, the fabless design firms and software firms kept their workstations where engineers

Table 2 IPR protection.

	IPR Protection 2004 (10=high)
US	9.0
Japan	7.2
Taiwan	6.5
India	5.0
China	3.7

Source: Gwartney, Lawson, and Easterley (2006).

designed their products in secure rooms only entered with special electronics cards and passwords. And they did not stop there. The workstations had no USB ports and were Internet-disabled so engineers could not steal the files with memory sticks or via the Internet. With the size of modern ICs and software programs, no one engineer could memorize sufficient digital data to steal significant IP just by relying on their memory.

In contrast to the ECFs, the foreign VCs were mainly interested in technology-light service-oriented ventures where they could see an existing large market in China currently or in the very near future. These VCs did not typically invest in IC design firms or other types of technology creation because they were concerned about IP theft and they were skeptical that anyone could make the returns they desired using less than cutting-edge technology on par with Silicon Valley in such endeavors.

The skepticism about returns on less than cutting-edge technology mirrored the confidence in this model of realizing respectable returns from investing in precisely this trailing technology evinced by the ECF VCs. This discrepancy suggests that the experience of different routes to success characterized by cutting-edge Silicon Valley versus trailing-edge Taiwan might also have influenced the investment patterns of the two types of firms. However, the difference in managing IP protection is both sufficient to account for the investment differences and has the advantage of utilizing metrics regarding the strength of IP regimes that comes from outside the interview data.

In either case, the foreign VCs and ECF VCs exhibited investment behavior based on learned paths to success within different institutional environments. The ECFs learned that one could informally protect IP and invest profitably in trailing-edge technology in Taiwan. The foreign VCs learned from their advanced country experience, principally in the US, that legal protection of IP was critical to their success and investing in trailing-edge, “me-too” technology was unprofitable.

Domestic VC firms suffer from the general maladies affecting the domestic Chinese financial system. China suffers from a severe misallocation of financial resources due to a state-dominated system riddled with non-economic motivations in allocating credit (Huang, 2003; Steinfeld, 1998; Yusuf, Nabeshima, & Perkins, 2006).

For the domestic VC firms, investment behavior is heavily constrained by the same non-economic considerations that prevent efficient allocation of credit throughout the financial system. Many of the domestic VC firms are effectively under the authority of state organizations.⁴ These political organizations naturally have many non-economic objectives that they expect their subsidiary organizations to pursue. These firms tend to be investment vehicles for larger state projects or state-sponsored firms, many of which suffer from all the classic maladies of soft budget constraints (Fuller, 2005; Huang, 2003; Steinfeld, 1998).

Of the two domestic private VC firms interviewed, one generally stayed away from the real business of venture financing. It shied away from financing early stage

⁴ One of the VCs was a university VC and most of the others were nominally corporations, but were tightly linked to various municipal governments through ownership ties.

firms because of the perception that these investments were too high risk. Given their lack of links with the state-run banking sector with its bias against private enterprises (Huang, 2003), this diffidence to invest in technology-intensive sectors is typical (Fuller, 2005; Gregory, Tenev, & Wagle, 2000).

The other chose to try to follow the lead of foreign VCs and invest where these VCs invested. Indeed, the two domestic firms that managed to actually do some investment in potentially promising start-up firms rather than state-funded projects followed this strategy. They decided to follow the investment lead of various foreign, including ECF, venture firms in order to resolve the self-identified problem of being inexperienced venture investors. Through this mechanism, they could rely on the better selection and monitoring skills of the foreign VCs. However, these two firms tended to invest in technology-intensive firms at the same rate of foreign rather than ECF VCs, i.e., 25% of their portfolio consists of technology-intensive firms.

Furthermore, the other firm that adopted this follower strategy clearly had political interference guiding some of its investment choices. The firm was set up by a central government ministry, but with a difference from the usual bureaucratic state-run venture firm. The appointed head decided to try to make a viable commercial firm out of the VC so he recruited a team of venture capitalists who had extensive VC experience outside of China. However, despite recruiting a team that resembled the typical ECF VC's management team, the ministry-led firm had to invest in a number of non-commercial state projects, such as science parks and other non-commercial projects, which were never designed to be profit-generating enterprises.

The role of semi-captive VC firms

Although for this study only a limited number of semi-captive VCs (five) were interviewed so it is especially difficult to make any generalities, these firms seemed to somewhat out perform their respective groups except for the high performing ECF VCs. The two foreign semi-captives among the interviewed firms exhibited similar behavior in their investment patterns. They tended to invest strategically in areas close to their parent organizations' core competency. Thus, if the core competency were in the type of technology-intensive hardware area of which China excels, they exhibited a greater propensity than other foreign VCs to invest in these areas. For example, one semi-captive's parent is in the IC business so this captive firm departed from the foreign VC pattern of ignoring technology creation by investing in some IC design firms. However, the director of Chinese operations for this firm admitted that these investments were often made on strategic rather than financial considerations. In other words, the foreign VC still viewed investments in technology generation as of dubious financial value. Moreover, for this firm, only approximately 30% of its targets were technology-intensive. Combined with the other, much smaller foreign semi-captive, the percentage went up to 33%, but this is still less than the average for the ECF VC firms.

As for the two semi-captive domestic VCs, one was the relatively cautious private firm and the other was the private firm that followed the investment leads of the

foreign VCs. Even so, the combined percentage of technology-intensive targets was only 20%.

Implications and future research

These divergent patterns suggest that both transnational and national institutional factors need to be taken into account in assessing the global reach of transnational entrepreneurship and point to legal regimes and co-ethnic transnational networks as two factors likely to affect transnational entrepreneurship across a wide variety of settings. The experience of technology entrepreneurship in China also offers evidence for alternative informal institutional mechanisms to compensate for weak IPR regimes. Further, the evidence shows that transnational networks and the entrepreneurs connected to these networks can play an important role in creating and supplying these informal compensatory mechanisms.

If one accepts the explicit assumption that more technology-intensive investments will encourage more technological development, the findings in this article also suggest that foreign firms, particularly ones linked to transnational ethnic Chinese technology networks, have a more important beneficial role to play in China than is often acknowledged by critics of China's large inflows of FDI (Huang, 2003). Furthermore, the findings point to the law-growth nexus (Dam, 2006) as not necessarily as tight as often assumed. Informal mechanisms, both within the firm and within networks, may be able to compensate for weak legal regimes.

Turning to future research, the grounded theory approach employed in this article to investigate the relationship between types of VC firms in China and technological development has yielded some tantalizing potential groups of VCs distinguished by distinct patterns of investing behavior relative to the technology sector. The next step is to construct a means to verify that these patterns are anything more than fanciful impressions left by a set of interviews. Given the motivating interest in seeing which VCs invest in technologically intensive firms, the proposed next step is to collect and collate US patent data for the last decade (the period covering most of the VC activity in China) for patents originating from China and trace back from patent-holding corporations to the VC firms that have funded these firms. Obviously, only start-ups created in China in this past decade of VC activity will be included so most of the patents owned by large multinationals will not be part of the data set.

Beyond the obvious advantage of providing an empirical test, using patent data provides two benefits. First, it corrects for the judgment calls, albeit necessary ones, made in this preliminary research on the technology-intensity of the firms involved by providing an independently derived metric for technological intensity. Second, the data will provide a view of any evolution or changes in these patterns over time.

Despite the need to make the data more robust, this article's contribution of a new conception of the multiplicity of coexisting rather than clashing institutional settings within one emerging economy is a significant one. Other research by the author documents that the same sets of institutions influence and differentiate behavior of firms beyond the VC industry (Fuller 2005, 2009a, b) and these findings suggest that

the patterns in the VC sector documented in this article will stand up to more robust empirical tests.

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