

Cross-Border Venture Capital Investments: Selection and Performance

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Abstract

We investigate the investment behavior and exit performance of VCs that have pursued expansion outside their home locations. Our findings indicate that, in the Asian VC markets, foreign VCs have relative advantages over local VCs in terms of size and experience while they are at a disadvantage in information collection and monitoring due to both geographic and cultural distances. When investing alone, foreign VCs are more likely to invest in more information-transparent ventures. Partnership with local VCs helps alleviate information asymmetry and monitoring problem and has positive implication for the exit performance of local entrepreneurial firms. We also show that well-developed legal framework and stock markets help attract foreign venture capital and contribute to higher probability of IPO exits.

JEL classification: G24; G32

Keywords: Venture Capital; Internationalization; Proximity; Cultural Distance; Information Asymmetry; Partnership; Venture Performance

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“Venture capital communities are springing up all over the world...Though the bulk of venture investment still resides in the United States, the growing pool of entrepreneurial talent is percolating beyond its border and represents both future competition and collaborative opportunities.”

----Deloitte, Global Trends in Venture Capital 2006 Survey

1. Introduction

Traditionally, venture capital investments have been a local activity with most venture capitalists never considering investments that have not been within driving distance (or at least a short plane ride) from their offices so that they could keep in close contact with their portfolio companies. However, Deloitte’s recent survey shows that more than half of U.S. VCs plan to expand internationally with China and India among their top attractions. The major reasons behind VCs’ interest in investing internationally include, for instance, taking advantage of lower cost structures and new opportunities in emerging markets, and diversification of industry and geographical risk.¹ On the other hand, VCs also recognize that expanding internationally presents additional risks and challenges. Among the various risks and challenges, a lack of knowledge or expertise in the local business environment seems to be a universal concern.²

Inevitable as globalization may be for the VC industry, as pointed out in Wright et al. (2005) and Bruton and Lau (2008), there is a comparative dearth of academic work on the investment behavior and performance of VCs while they invest across borders. Many important questions remain unaddressed or unsettled. For instance, how do frictions associated with geographic distance and a different cultural, regulatory, and political environment impact their investment behavior? What are the VCs’ responses or solutions to these issues and how effective are they? In this paper, we empirically examine these issues related to investments by foreign VCs in Asian countries, including China and India, during the 1996- 2006 period.³ We focus our analysis on the Asian market for the following reasons. First of all, this market is young and relatively underdeveloped and thus less studied in the existing literature with a few exceptions (Bruton and Ahlstrom, 2003; Wright and Lockett, 2003; Bruton et al., 2005; Bruton and Lau,

¹ Deloitte, “Global Trends in Venture Capital”, 2006 and 2007 surveys.

² Ibid.

³ China has undergone a gradual transition since 1978 from a centrally planned economy dominated by public ownership to a market economy driven by entrepreneurial activities (Bai et al, 2006; Lu and Tao, 2010).

2008; Young et al., 2008; Siqueira and Bruton, 2010). Second, given the undeveloped nature of the local venture capital industry and the uniqueness of cultural and social norms in this area, it provides an excellent setting to examine how foreign VCs respond to the substantial frictions associated with both geographic distances and cultural disparity, and the effectiveness of their responses. Third, given the fast growth and increasingly important economic power of China and India, this area has attracted and continues to attract many foreign investors including foreign venture capital investors. Our study thus will provide timely insights for the practitioners seeking or planning for such expansion in this area.

We examine a number of hypotheses that relate to the formation of different venture ownership types and their impact on the performance of the entrepreneurial firms. Specifically, we consider the following factors, the different levels of experience and resources possessed by foreign and local VCs, the information friction and monitoring cost associated with both the geographic and cultural distances of the VCs to the companies funded, the partnership between foreign and local VCs, the overall legal protection provided to investors and the sophistication of the financial markets.

We start with examining the differences between foreign and local VCs in the Asian markets. Our empirical results indicate that in the Asian VC market, foreign VCs play an important role. Among the total of \$35 billion investment in the Asian VC market from 1996 to 2006, more than 70% of the funding is provided by foreign VCs. Foreign VCs are significantly larger, more senior, and with more investment experience than local VCs. There exist partnerships between foreign and local VCs either through syndication in the same round of financing or funding the same venture in different rounds. However, foreign VCs, more often, act alone (without local VCs) in making investments in the Asian VC market.

Second, we examine how the frictions associated with geographic distance and cultural disparity impact VCs' behavior when they explore their investment opportunities in unfamiliar territory. We observe that foreign VCs try to avoid investing in information opaque local firms when they are investing alone. For instance, they are less likely to invest in seed or early stage firms or participate in the very first round. Partnership with local VCs seems to help alleviate such frictions to some extent. By forming alliances with local VCs, foreign VCs invest more aggressively in early stage ventures and ventures in technology industries than those acting alone. Establishing branch offices in the local markets is also a commonly seen solution to such frictions, which is found to have a negative association with the probability of partnership between foreign and local VCs. Furthermore, we find the cultural distances between the origin country of the foreign VC and the country of the local VCs discourages the formation of

partnership between the two. Our finding raises the concern that while foreign VCs recognize their lack of knowledge in the local business environment and try to establish partnership with the local VCs, the information asymmetry and cultural disparity between foreign and local VCs could impede their effort in this regard.

Third, we analyze the impact of legal framework and stock market development of the local markets on foreign VCs' selection of companies to be funded and their partnership with local VCs. Consistent with the literature (Cumming et al., 2006; Cumming et al., 2010), we show a well developed legal framework and stock market help attract foreign venture capital. We further find that the higher value of legality index, indicating more investor protections, is associated with a smaller need of partnership with local VCs. In other words, foreign VCs feel more comfortable with investing alone in a solid legal environment.

Fourth, we examine the performance implications of the above mentioned factors. We show that entrepreneurial firms jointly invested by foreign and local VCs significantly outperform those invested by foreign VCs alone and by local VCs alone. This finding is robust after we control for the endogeneity of the matching between VCs and firms using the propensity score matching. Specifically, firms with both foreign and local VCs as investors are about 5% more likely to successfully exit as IPOs. Sorenson and Stuart (2001) and Hochberg et al. (2007) show that VCs' networking helps overcome frictions with distance and enhances VC fund exit performance in U.S. Our finding provides novel evidence that in international venture capital investments, partnership between foreign and local VCs can provide potential synergy in exit performance. Further, we show a better developed stock market contributes to higher probability of IPO exits, confirming the notion that stock market provides a viable exit mechanism for both venture capital investors and entrepreneurs (see, e.g., Black and Gilson, 1998).

In our view, by studying the investment strategy and performance when VCs invest across borders, we contribute to the literature in several ways. First, this paper deepens the understanding of VCs' investment behavior while they are pursuing or expanding their international investing focus, and thus adds to the research focusing on issues related to the internationalization of VCs (see, Wright et al., 2005; Makela and Maula, 2006, 2008; Bruton and Lau, 2008). We find in contrast to local VCs, due to frictions associated with geographic and cultural distances, foreign VCs are more likely to invest in information transparent firms while they are investing alone. Foreign VCs make efforts to develop partnerships with local VCs in order to overcome the frictions associated with distance, which has a positive performance implication. Second, our paper contributes to the foreign direct investment literature. Most of the existing studies focus on the manufacturing sector (see e.g., Aitken and Harrison, 1999; Javorcik,

2005; Petkova, 2008; etc). As pointed out in Wright et al. (2005) and Meuleman and Wright (2010), the internationalization of the VC/PE industry is distinctive from the manufacturing sector or other professional and financial service sectors. In contrast to the aim of managerial control in the traditional foreign direct investment, VC firms' ultimate purpose is to realize the financial returns, and consequently, exit is strategically important for VCs. On the other hand, VCs assume an active role, tutoring, advising and monitoring the entrepreneurs, to add value to the entrepreneurial firms. Therefore, the information asymmetry and moral hazard associated with distance and cultural disparity is particularly acute. Our study provides distinct empirical evidence to this literature by investigating VCs' behavior when investing across borders. Third, our paper provides new evidence to the literature on cross-border VC/PE syndication (e.g., Makela and Maula, 2006, 2008; Manigart et al., 2006; Meuleman et al. 2009; Meuleman and Wright, 2010; etc). We show that in addition to VCs' organizational form, age, and experience, the cultural distance between the origin country of the foreign VC and the country of the local VC also matters. We further extend the literature by showing that partnership with local investors is significantly related to the ultimate performance of the ventures. Fourth, our paper is also related to the development of the VC industry in the emerging market. Most of the existing international VC literature focuses on developed countries such as U.S. and the European area (Manigart, 1994; Sapienza et al., 1996; Manigart et al., 2002; Guler, and Guillen, 2009; Meuleman et al., 2009). Our paper adds unique empirical evidence regarding the VC industry in Asia which has been very much underdeveloped but at the same time is becoming increasingly attractive market (especially China and India) for international VCs. Our findings thus also have implications for the practitioners regarding the strategy to invest in the Asian VC market.

The remainder of the paper is organized as follows. Section 2 provides a brief literature review and develops the hypotheses. Section 3 describes the sample and presents the summary statistics. In section 4, we examine the investment criteria of foreign VCs. Section 5 examines the performance implications of VC ownership type. Finally, in Section 6, we summarize our findings, explore their implications, and discuss their limitations.

2. Literature Review and Hypotheses Development

In this paper, we study the investment behavior of VCs while they pursue expansion outside their home locations, specifically, VCs from developed economies expanding their investments to the emerging Asian markets. We examine a number of hypotheses that relate to

the formation of different venture ownership types and their impact on the performance of the entrepreneurial firms. Specifically, we consider the following factors, the different levels of experience and resources possessed by foreign and local VCs, the information friction and monitoring cost associated with both the geographic and cultural distances of the VCs to the companies funded, the partnership between foreign and local VCs, the overall legal protection provided to investors and the sophistication of the financial markets.

Siqueira and Bruton (2010) show that emerging economies have greater resource constraints and more informality than developed economies. Similar constraints and informality might appear in the venture capital industry of the emerging economies. The venture capital industry is rather young and underdeveloped in the Asian markets we examine in this paper. There are a small number of local VC firms, which are often operating on a small scale and not able to offer much value-adding advice to the entrepreneurial firms due to their limited experience (see, e.g., Bruton and Ahlstrom, 2003). Foreign VCs from U.S. and other developed economies, on the other hand, have rich experience developed in their home countries and are more resourceful in terms of amount of capital and networks they possess. Manigart et al. (2002) and Hopp and Rieder (2006) suggest that portfolio diversification and resource driven motives complement the risk mitigation perspectives. Boone et al. (2008) postulate that professional services companies learn through experience over time following a learning curve and that this knowledge does not depreciate over time. We expect foreign VCs are able to apply their experience and network developed in their home countries when they expand their investments into the international markets. Our first hypothesis then is:

H₁: In emerging economies such as the Asian markets we examine, local VCs are not as experienced or resourceful as foreign VCs who headquarter in developed countries.

Albeit foreign VCs may have advantage in experience and resource, they are often constrained by the information friction due to the geographic distance (See, Deloitte's Survey). There is a growing literature that shows that distance matters for information-collection-based financial activities. The local/proximity hypothesis is related to the financial economics literature on arm's length versus relationship transactions. Different from dispersed arm's-length investors, banks are able to screen projects and monitor borrowers more efficiently to mitigate information asymmetry problems. Rajan (1992) provides a formal model in which potential hold-up problems associated with borrowing from a single bank limit a firm's reliance on bank borrowing. Rajan (1992) further notes that close lending relationships enable banks to exercise a significant

influence over, and thereby expropriate rents from, borrowing firms. For example, as firms work more closely with banks, they find it harder to raise funds through other means and can be held up by the banks. Coval and Moskowitz (1999, 2001) find that among all local stocks, U.S. mutual fund managers prefer to own stocks of companies located nearby and earn higher risk-adjusted returns. Peterson and Rajan (2002) show that although the average distance between small business and their lenders has increased because of better information technology, it remains an important determinant of how businesses and lenders match with one another. Nearby lenders can collect so-called “soft information” about potential borrowers, which helps them, make better lending decisions, but distant lenders are not privy to this information.

Ivkovic and Weisbenner (2005) find that local households earn significantly greater returns from local holdings relative to more distant holdings, suggesting that local investors can exploit local knowledge. In a similar vein, Malloy (2005) provides evidence that geographically proximate equity analysts give more accurate forecasts than distant analysts, and that local analysts’ forecasts have a greater impact on stock prices. Using a large sample of partial block acquisitions in the U.S., Kang and Kim (2008) examine the importance of geographic proximity in corporate governance and target returns. They find that block acquirers have a strong preference for geographically proximate targets and acquirers that purchase block shares in such targets are more likely to engage in post-acquisition target governance activities than are remote block acquirers. They conclude that information asymmetries or monitoring costs associated with geographic proximity are an important source of gains in partial block acquisitions. Cumming and Dai (2010) examine the impact of distance on the ultimate success of entrepreneurial firms in the U.S. VC industry. They find ventures proximate to their VCs are more likely to exit successfully via IPO or M&A controlling for the quality of ventures and VC reputation. All these evidences point to the importance of the geographic distance in investments as information advantage and reduced monitoring cost due to proximity matter for the returns.

Foreign VCs—by virtue of headquarters location in another nation—are less able to process “soft” information about opaque local firms and/or their local market conditions—and therefore would be more likely to use their advantages in processing “hard” information and enter into relationships with more transparent firms. The distance also makes close monitoring difficult. To reduce agency cost and moral hazard, foreign VCs would again avoid investing in information opaque firms. On the other hand, local VCs have information advantages over foreign VCs. They are more able to process “soft” information about local firms and have better knowledge of local market conditions. It is also less costly for them to monitor the local entrepreneurs. In summary, our second hypothesis is:

H₂: Foreign VCs are more likely to invest in information-transparent firms due to the frictions associated with geographic distance (for instance, later financing rounds, later stage ventures, and ventures in non-technology industries).

The different cultures of the origin countries of foreign VCs and local firms would potentially also impact the VCs' behavior. As pointed out in Wright et al. (2005), cultural influences and social norms are often neglected in understanding the behavior of VCs despite their importance with a few exceptions. Pruthi et al. (2003) find that domestic and foreign VCs differ in their monitoring activities by examining the behavior of 31 VCs in India: domestic firms are more involved at the operational level whereas the foreign VCs are more participative at the strategic level. Contractor et al. (2003) indicate companies going overseas bring experience but suffer lower returns until they become accustomed to the local culture and networks. In this regard, we fill the gap in the literature by examining how the cultural disparity between foreign VCs and local firms, as well as local VCs, might impact VCs' behavior. For instance, a VC from Japan investing in China potentially will have relatively less difficulty in understanding the cultural and social norms of the local entrepreneurial firms than a U.S. VC. This understanding would help reduce information friction and improve the communication between investors and investees. Furthermore, the cultural distance between foreign VCs and local VCs potentially will influence the probability of forming a syndicate between them and the effectiveness of such syndicate. The similar cultural and social background, or shorter cultural distance, presumably will facilitate the cooperation between foreign VCs and local VCs.

We use Hofstede's (2001) measures of country culture to compute cultural distances between the origin country of the foreign VCs and the country of the entrepreneurial firms. Hofstede classifies culture into four major dimensions – small versus large power distance, uncertainty avoidance, individualism versus collectivism, and masculinity versus femininity. *Power distance* measures the degree of equality, or inequality, between people in the country's society. *Uncertainty Avoidance* captures the society's attitude towards uncertainty and its attempt to cope with anxiety in uncertain situations. *Individualism* refers to the extent the society helps reinforcing the individual achievement, whereas *collectivism* emphasizes collective action by individuals. *Masculinity* reflects the extent to which the society values the traditional masculine features such as assertiveness, achievement, competitiveness, and the accumulation of materialistic possessions. In contrast, *femininity* emphasizes relationships and quality of life. Following the existing studies, we use the Hofstede measures of the four

dimensions of a society's culture, and then use the differences in the measures to capture the idea of "cultural distance" between countries.⁴ Our hypotheses are summarized as follows.

H_{3a}: The greater the cultural distance between the origin country of foreign VCs and the country of the local VCs, the less likely the foreign and local VCs will form partnerships.

H_{3b}: Cultural distance between the origin country of foreign VCs and the country of the local entrepreneurial firms is negatively correlated with the performance of the entrepreneurial firms.

According to Deloitte's surveys, VCs that pursue international investing are aware of the additional risk and challenges associated with the physical distance and the cultural disparity. To overcome these risks, in practice, foreign VCs have developed several strategies. For example, some VC firms explore the investment opportunities in foreign countries by establishing a local branch office and hire local professionals. For instance, Softbank China Venture Capital is a branch office of Softbank Venture Capital, which is headquartered in California. Some Foreign VCs form partnership with local VC firms to reduce information asymmetry and co-manage local investments. For example, Mayfield, a major VC firm in U.S., is an investor in GSR Ventures, a local Chinese VC firm, and GSR Ventures manages Mayfield China (a China fund affiliated with Mayfield) together with Mayfield. A third approach is to syndicate with independent local VC investors in a specific financing round. For instance, Walden International, headquartered in the US, and Ceyuan Ventures, a local VC firm in China, co-invest in 3GPP, a Chinese venture. Ideally, we would like to examine all three approaches and their effectiveness in reducing information asymmetry and agency cost in international venture capital investment. Given the data constraint, we focus our analysis on the cooperation between foreign VCs and local VCs, and the branch office established by foreign VCs in Asia over our sample period.⁵

Bruton et al. (2005) indicate the VCs follow the U.S. model although they operate in a different environment. Hitt et al. (2006) indicate that the human and relational capital creates benefits in the international arena. Unger et al. (2010) meta-analytically integrate results from three decades of human capital research in entrepreneurship. They found a significant, but weak relationship between human capital and success. They also examine theoretically derived

⁴ The mathematic formula for estimating cultural distance is introduced in the empirical section.

⁵ Bouquet, Hebert and Delios (2004) suggest that international companies gravitate towards wholly owned subsidiaries and expatriate managers if close relationships with end customers and a high level of skills are necessary for successful operations. Anecdotal evidence shows that many VC companies either expatriate their managers or hire local talents to make investment and monitoring smoother. However, these data are not collected by the major venture capital databases including VentureXpert. A future research potentially using hand-collected data would help fill this gap.

moderators of this relationship referring to conceptualizations of human capital to measurement of success. The relationship was higher for outcomes of human capital investments (knowledge/skills) than for human capital investments (education/experience) and other factors. Brander et al. (2002), Wright and Lockett (2003), and Gompers et al. (2009) also suggest that VC syndication provides a wide range of skills and networks to portfolio companies. So although some companies in the services area tend towards expatriate staff (Bouquet et al., 2004), foreign VCs can collaborate with local VCs to leverage their resources so that they can cover these different skills each of which are necessary for success. Sorensen and Stuart (2001) show that in U.S. venture capital investments, syndicates between distant VCs and local VCs help overcome information asymmetry and agency problems. Foreign VCs, presumably, could benefit from forming various types of partnerships with local VCs in terms of reducing information asymmetry and improving effectiveness of monitoring, and therefore, amplifying the value-addition aspect of VCs (see, for example, Hellman and Puri, 2002; Lindsey, 2008; and Hochberg et al., 2010). Thus, we expect that the partnership between foreign and local VCs will make it possible to invest in more information opaque local ventures than if foreign VCs invest alone.

Partnership between local and foreign VC firms can provide potential synergy in exit performance. Hochberg et al. (2007) provide a comprehensive examination of the impact of the VCs' networking on VC fund performance or their attendant relationships, and conclude that VCs' networking greatly enhance VC fund exit performance. Das et al. (2010) assess how syndication impacts investment returns, chances of successful exit, and the time taken to exit, and they attribute improved exit performance to the selection efforts of the syndicate, and more likely and timely exit to value-addition along with selection efforts. In the setting of international venture capital investments, firms with both foreign and local VCs on board will be able to enjoy the benefits of the experience and resource of foreign VCs and the reduced frictions due to geographic and cultural distances with the assistance from local VCs. This is expected to have positive impact on the ventures' exit performance. Hochberg et al. (2010) suggest that syndication may also be used as a barrier to entry whereby networks of VCs aim to control market share.

Branch offices in the local area may help foreign VCs reduce information asymmetry and facilitate post-investment monitoring. This has the following two implications. First, foreign VCs with branch offices in the local area face less information frictions associated with geographic distances, indicating a smaller need to form partnership with local VCs. Second, the improved information environment and reduced monitoring cost allow foreign VCs to provide more value-

adding services, which indicate a better performance of companies they funded. In summary, we expect the following.

H_{4a}: Forming partnership with local VCs allow foreign VCs to process “soft” information more effectively and thus they are willing to invest in more information opaque local firms.

H_{4b}: Firms invested jointly by foreign and local VCs outperform those invested by local VCs or foreign VCs alone.

H_{4c}: Foreign VCs with branch offices in the local areas face less severe information problem and thus have smaller need for partnering with local VCs.

H_{4c}: Foreign VCs with branch office in the local area are able to provide more value-adding services thus firms invested by these foreign VCs perform better.

Cumming et al. (2006) and Cumming et al. (2010) show that legality impacts performance of entrepreneurial firms in emerging economies. They argue that differences in legality have a significant impact on the governance structure of investments in the VC industry. They claim that a better legal system results in faster deal screening and origination, a higher likelihood of syndication, and more board representation for investors. Because sound legal frameworks have crucial implications for solving agency and control problems inherent in young, innovative firms, they conclude that legality is an important prerequisite for sustained VC development in a country.

The U.S. evidence shows that a well developed stock market is extremely important to the development of a venture capital industry as it provides a viable exit mechanism for both investors and entrepreneurs (Black and Gilson, 1998). Jeng and Wells (2000) and Hazarika et al. (2010) provide cross-country evidence that the level of stock market development matters for venture capital investment.

In this paper, we consider the potential impact of both legal protections provided to investors and the overall level of stock market development on attracting foreign venture capital in the Asian markets. We extend the literature by further considering their impact on facilitating the partnership between foreign and local VCs and the exit performance of local ventures. Along the reasoning in the above mentioned literature, we believe a better legal environment and more developed stock markets increases foreign venture capital investment in the local market and increases the possibility of exits as IPOs. The impacts of these two factors on the formation of partnership between foreign and local VCs, however, are not as clear. We conjecture that on one hand, a well-developed legal framework and stock market might help establishing the trust

between foreign and local VCs and thus facilitates the partnership; on the other hand, they could also make foreign VCs feel more comfortable with investing all by themselves in these countries. These predictions are summarized as follows.

H_{5a}: Legal protections provided by the local countries and a better developed financial market help in attracting foreign venture capital investment.

H_{5b}: Better legal framework and better developed local financial market are positively correlated with the performance of local entrepreneurial firms.

H_{5c}: Better legal framework and better developed local financial market encourage partnerships between foreign and local VCs.

H_{5d}: Foreign VCs are more likely to invest alone in a better legal and financial environment.

3. Data and Summary Statistics

Our sample includes 4254 rounds of venture capital financing by 468 venture firms in the following Asian countries or districts: Mainland China (China hereafter),⁶ Hong Kong, Taiwan, India, Singapore, and South Korea from 1996 to 2006 as documented by VentureXpert Database.⁷ The IPO information is collected from Thomson Financial Global New Issues Database.

As shown in Table 1, a total of 2860 venture companies received venture capital financing, including 640 ventures located in India, and 418 ventures in China. Over the 11-year period, a total of \$35.4 billion of venture capital has been invested in this area that includes \$26.4 billion invested by foreign VCs. The average round size ranges from \$4.6 million (South Korea) to \$17.3 million (Singapore) and the median round size ranges from \$0.6 million (South Korea) to \$5.5 million (China).

[Insert Table 1 here.]

Most of the foreign VCs are US VCs. As shown in Panel B of Table 1, a total of 247 out of 468 foreign VCs (52.8%) are US VCs. They have participated in 1586 rounds, with a total invested amount of \$17.9 billion, which is 67.8% of all foreign venture capital invested in these markets. Asian VCs' cross investment is also prevalent. A total of 147 foreign VCs are from the nearby Asian countries. This group of VCs has participated in 501 rounds of new ventures and

⁶ Here, Mainland China refers to the People's Republic of China excluding Hong Kong and Macau. We use China and Mainland China interchangeably in the paper.

⁷ As VentureXpert data are somewhat unreliable and less complete in the early period, we focus our analysis on the relatively recent period. We further discuss the potential biases of the database and their implications for our findings in greater details in Section 6.

has invested \$6.6 billion in total. The third group of foreign VCs is from various countries other than US and Asia. This group invested in 242 ventures a total of \$1.9 billion.

We define venture ownership type at two levels. First, at the round level, *foreign VC investment* refers to financing rounds that are invested by foreign VCs alone; *local VC investment* refers to financing rounds that are invested by local VCs alone; *joint investment* represents those financing rounds that are invested by foreign and local VCs together. Second, at the entrepreneurial firm level, *foreign VC investment* refers to ventures that are invested by foreign VCs alone in all rounds; *local VC investment* refers to ventures that are invested by local VCs alone in all rounds; *joint investment* represents those ventures with both foreign and local VCs investing in the venture.

In Table 2 Panel A, we categorize VC financing rounds based on VC ownership type; in Table 2 Panel B, we categorize entrepreneurial firms based on VC ownership type. About 27% of the 4254 financing rounds are invested by foreign VCs alone, about 56% are invested by local VCs alone, and the remaining investments are by partnerships of foreign and local VCs. Some countries seem to rely on foreign VCs for funding of young private firms more heavily than local VCs. For example, in China, foreign VCs participate in 88% of the financing rounds, among which 66% are financed by foreign VCs only, and only 12% of the financing rounds are purely financed by local VCs. Among the 418 China local ventures, 86% have certain percentage of foreign VC ownership, among which 60% are alone financed by foreign VCs, while only 14% are alone financed by local VCs. On the other hand, in South Korea, 74% of the young private firms are purely invested by local VCs, while only 5% of the entrepreneurial firms are alone invested by foreign VCs.⁸

[Insert Table 2 here.]

In Table 3, we compare the size, age, and investment experience of local VCs and foreign VCs investing in Asia. Local VCs seem to be significantly smaller, younger, and less experienced than foreign VCs. Using China as an example; there are 56 local VC firms in total, while 233 foreign VC firms have been investing in China during our sample period. The average capital under management is \$307 million for Chinese local VCs, while it is \$2,157 million for foreign

⁸ Mainly due to government policy, detailed regulation, and relatively smaller size of entrepreneurial market in Korea during the sample period of 1996-2006, there are so few foreign VC deals in South Korea. The main reasons of the smaller size of Korean entrepreneurial market are that they are on average younger and less successful than U.S. ones, but another reason is that large asset management institutions such as pension funds and insurance companies have not participated yet in the VC partnerships in Korea (Jo, Kang, and Oh, 2008). Compared to other countries, South Korea is clearly an outlier. Thus, we have conducted robustness checking by excluding South Korea from the sample, and obtain qualitatively similar results.

VCs. The average age of Chinese local VCs is 6 years. In contrast, foreign VCs have an average age of 14 years. The average number of entrepreneurial firms invested by Chinese local VCs is 22, while it is 197 for foreign VCs. The significant differences between local VCs and foreign VCs also exist in other Asian countries. The finding from the Panel A of Table 3 supports the notion that in the emerging Asian economies, foreign VCs have advantages over local VCs in that they are more resourceful and more experienced, consistent with our *Hypothesis 1*.

[Insert Table 3 here.]

4. VC Ownership Type and Venture Characteristics

4.1. Univariate Analysis

Table 4 presents the univariate analysis of venture characteristics associated with different VC ownership type. We use three groups of measures as proxies for the level of information asymmetry and uncertainty. The first measure is round number. First round of financing typically has greater risk. With the certification of first round VC investors, later rounds are relatively less risky (Lerner, 1994). The second measure is the life stage of ventures at the time receiving venture capital. We define the following four stages: startup/seed stage, early stage, expansion stage, and later stage. Ventures at their early stages have higher level of information asymmetry and uncertainty than ventures at their later stages. The third measure is industry. Ventures in high-technology industries have greater level of information asymmetry and uncertainty. We identify the following six industry groups: computer-related, communication and media, semiconductor, biotechnology, medical/health care, and non-technology.

[Insert Table 4 here.]

We find that foreign VCs allocate smaller percentage of their investments to first round financing. For instance, 76% of local VCs' investments are first round financing, while only 62% of foreign VCs' investments are. We also find that foreign VCs are less likely to invest in seed and early stage ventures. For example, about 39% of local VCs' investments are allocated to seed and early stage ventures, while only 27% of foreign VCs' investments are for ventures at seed or early stages. Furthermore, foreign VCs are more likely to invest in non-technology ventures. About 35% of foreign VC investments are allocated to ventures in non-technology industries, while only 29% of local VC investments are made to non-technology ventures. Interestingly, this percentage is even lower (19%) when foreign and local VCs form partnership. At the company level, we find similar patterns. In comparison to ventures invested by local VCs alone, ventures

with investments from foreign VCs only, often receive their first round of financing at their expansion stage or later stage. They are also more likely to be non-technology ventures. However, when foreign VCs invest jointly with local ones, we see significantly higher percentage of seed and early stage ventures (49%) and technology ventures (82%) in their portfolios, higher than both foreign VCs only and local VCs only.

In Table 4 Panel C, we compare the investment size by foreign VCs and local VCs. We find that ventures with foreign VC participation, in general, receive more rounds of financing. Average round size is also greater than those invested by local VCs. For instance, the mean and median round sizes for ventures financed by foreign VCs alone are \$16.6 million and \$5.3 million respectively, while they are \$2.4 million and \$0.6 million for ventures invested by local VCs alone. Ventures invested by foreign and local VCs jointly have investment size that is between these two values. This finding indicates that ventures with investments from foreign VCs overall have better access to financial capital.

4.2. Regression Analysis

We analyze the determinants of VC ownership type at the round level using probit regressions in Table 5. The dependent variable in the first regression is an indicator variable which is equal to 1 if a specific financing round has foreign VC participation, which could be foreign VCs alone or a syndicate of foreign and local VCs; and 0 otherwise. The dependent variable in the second regression is an indicator variable which is equal to 1 if a specific financing round is a joint investment by foreign and local VCs; and 0 if foreign VCs invest alone. We include year and entrepreneurial firm country fixed effects in all specifications.

Our independent variables include measures of information asymmetry: (a) round size and number; (b) the stage of ventures at the financing round date; (c) the industries in which the ventures reside. In addition, we control for lead VC characteristics such as independent VC, Corporate VC, whether the VC fund is a seed or early stage fund, VC age, total investment experience, whether the VC has a branch office in Asia, and the cultural distance between the origin country of the foreign VC and the nation of the entrepreneurial firms. Further, we also control for country legality and stock market development. We use the Hofstede measures of the four dimensions of a society's culture, and then use the differences in the measures to

capture the idea of “cultural distance” between countries.⁹ Following Cumming, et al. (2006) and Cumming et al. (2010), we measure the legality of a specific country as the weighted average of the following factors (based on Berkowitz et al., 2003, and Cumming et al., 2006): civil versus common law systems, efficiency of judicial system, rule of law, corruption, risk of expropriation, risk of contract repudiation, shareholder rights (as in La Porta et al., 1997, 1998, 1999). Higher value of legality index indicates “better” legal system. Following Wurgler (2000), Khurana et al. (2006), and Love (2007), we measure stock market development as the average of the three normalized indices, including Stock market capitalization/GDP, Total value of shares traded/GDP, and Total value of shares traded/stock market capitalization. The definition of all other variables is provided in the Appendix.

[Insert Table 5 here.]

The empirical results are presented in Table 5. We report the marginal effects (probability), labeled as ME, for each independent variable. We show foreign VCs are less likely to invest in the first round and seed/early stage ventures. Specifically, ventures raising their very first round are 5% less likely to obtain foreign VC participation. The seed stage ventures and early stage ventures are about 13% and 6% less likely to obtain foreign VC investment, respectively. These findings are consistent with the univariate analysis and provide support to the idea that VCs are likely to behave in a way that is consistent with *Hypothesis 2* where information asymmetry associated with distance prevents foreign VCs from investing in more information-opaque companies. Furthermore, foreign VCs are more likely to invest in ventures with greater capital demand and computer-related ventures, as well as ventures in the communication and media industry.

Table 5 also provides further insight regarding the differences between foreign and local VCs. For instance, we show that the foreign VCs are often independent VCs or CVCs, while many local VCs are sponsored by governments or affiliated with other financial intermediaries such as banks. Foreign VCs investing in Asia are less likely to be a seed/early stage fund. In addition, we show that foreign VCs investing in Asia in general are more senior and more experienced than local VCs, consistent with *Hypothesis 1*.

⁹ Specifically, we compute the cultural distance as follows: Hofstede cultural distance =

$$\left(\sum_{i=1}^4 (H_{VC,i} - H_{EF,i})^2 \right)^{1/2}$$

4, where $H_{VC,i}$ is the Hofstede measure of the lead VC’s origin country on cultural dimension i , and $H_{EF,i}$ is the Hofstede measure of the entrepreneurial firm’s country on cultural dimension i .

We also find that the better legality of the country where the entrepreneurial firms are located significantly and positively increases foreign VCs' investments in the local market, indicating that more solid legality helps local entrepreneurial firms attracting foreign VC investment. Stock market development also significantly increases the probability of attracting foreign VCs' investments, consistent with Guler and Guillen (2009) who find that U.S. VCs are more likely to invest in countries with developed financial institutions. Both findings lend support to *Hypothesis 5a*.

In the second regression in Table 5, we show that by forming partnership with local VCs, foreign VCs invest more aggressively in early stage ventures. In terms of economic significance, foreign VCs are about 10% more likely to invest in the early stage ventures when investing together with local VCs than when investing alone. We further show that foreign VCs are 6% more likely to invest in computer-related, 11% more likely to invest in semiconductor, and over 30% more likely to invest in biotechnology ventures if they partner with local VCs than if they are investing alone. These findings indicate that partnership with local VCs allows foreign VCs to overcome their information disadvantages to some extent so that they are able to invest in local firms that would otherwise have been too risky to them without the assistance from local VCs. This finding supports the idea of *Hypothesis 4a* where working with local VCs provides a practical solution to the information asymmetry problem associated with both geographic and cultural distance and allows foreign VCs to leverage their resources to establish better relationship with all parties.

In addition, we find that more experienced VCs are more likely to form partnerships. Specifically, one standard deviation increase in *Ln (Total Investment Experience)* increases the probability of joint investment by 6%. Cultural distance significantly decreases the probability of forming partnership between foreign VCs and local ones, supporting *Hypothesis 3a*, but it had a very small marginal effect (0.5%). Country legality index is significantly and negatively correlated with the probability of joint investment, suggesting that foreign VCs are more comfortable with investing alone if the nation provides better legal protections. This finding is consistent with *Hypothesis 5d*.

In Table 6, we analyze the determinants of VC ownership type at the entrepreneurial firm level. The dependent variable in the first regression is an indicator variable which is equal to 1 if at least one foreign VC participated in any of the ventures' financing rounds; and 0 otherwise. The dependent variable in the second regression is an indicator variable which is equal to 1 if a venture is invested by a group of foreign and local VCs; and 0 if it is invested by foreign VCs alone through all rounds. The independent variables include measures of information asymmetry:

(a) the stage of ventures when they received their first round of financing; (b) the industries that ventures reside in. In addition, we control for various characteristics of the lead VC, which is here defined as the VC that invests the largest amount in the very first round, including independent VC dummy, CVC dummy, seed or early stage fund dummy, the natural logarithm of VC firm age, and the natural logarithm of the total number of entrepreneurial ventures that the VC firm had invested before as a proxy for VC investment experience. In the second regression, we further include a dummy variable indicating whether the foreign VC has a branch office in Asia and the cultural distance between the origin country of the lead VC and the nation of the entrepreneurial firm. Similar to Table 5, we include legality index and stock market development measures as well as a year fixed effect and an entrepreneurial firm country fixed effect.

[Insert Table 6 here.]

We find that foreign VCs are 6% more likely to finance computer related ventures and 10% more likely to invest in communication/media ventures. However, they are 16-27% less interested in seed or early stage investments, supporting *Hypothesis 2*. Consistent with *Hypothesis 1*, we again show that foreign VCs are in general more senior and more experienced than local ones. Further, they are less likely to be seed or early stage funds. Both country legal protection and stock market development help attracting foreign venture capital, supporting *Hypothesis 5a*.

In the second regression of Table 6, we further show that with a local partner, foreign VCs are 18% more likely to invest in the startup/seed stage ventures than if investing alone. Furthermore, foreign VCs are significantly more likely to finance ventures in almost all technology sectors (with the exception of the medial/health care) when they form partnerships with local investors. These findings suggest that the presence of local VC either in previous round or the current round helps in reducing information friction for foreign investors, which allows them to invest in ventures with more uncertainty. These findings support *Hypothesis 4a*.

We find that more senior foreign VCs are more likely to form partnership with local VCs. This reflects the fact that local VCs often are more willing to work with reputable foreign VCs. If the foreign VCs have a branch office in Asia, they are less likely to form partnership with local VCs. This finding indicates both partnership with local VCs and having branch offices in the investee's country help reduce frictions associated with geographic distance in international venture capital investments. They substitute each other to some extent. This finding is consistent with *Hypothesis 4c*. We further show that cultural distance between the local VCs and foreign VCs has a significantly negative effect on the probability of joint investment, consistent with *Hypothesis 3a*. Chakrabarti et al. (2008) and Guiso et al. (2008) show that countries with higher cultural distance display higher mutual distrust. Our finding indicates that the distrust between

foreign VCs and local VCs due to cultural differences could be a serious hurdle for them to form partnership.¹⁰

In summary, foreign VCs exhibit different preference from local VCs when they are making investment decisions. In general, foreign VCs are more experienced and resourceful than local VCs. They avoid investing in ventures with great information asymmetry and uncertainty due to information friction and cultural disparity associated with both geographic and cultural distances. This constraint is, however, alleviated to some extent by forming partnership with local VCs and by establishing branch offices in the local areas. The legal environment and the level of development of the local financial market are also important factors that attract foreign venture capital investments.

5. VC Ownership Type and the Performance of Ventures

5.1. Univariate Analysis

We follow Gompers and Lerner (1998, 2000), Brander et al. (2002), Sorenson (2007), Hochberg et al. (2007), and Das et al. (2010) in viewing a successful exit as a representation of the venture's success. Specifically, we estimate the probability of IPO exit by the end of 2007. Because it typically takes 5-6 years for VCs to exit from their investments, to avoid the potential bias, we exclude ventures that obtained their first round of financing after the end of 2002 for the purpose of analysis in this section. This leaves us 2,101 ventures. Table 7 reports the frequency distribution of IPO exit based on VC ownership type. Overall, about 9.7% (37 out of 383) of ventures financed by foreign VCs and about 10.3% (48 out of 465) of ventures jointly invested by foreign and local VCs went public successfully. In contrast, only about 5% (66 out of 1263) of ventures financed by local VCs alone went public. Ventures with foreign VC investments are also more likely to cross-list in foreign capital market. In fact, we do not find a single case where ventures financed by local VCs alone cross-list in foreign IPO markets.

[Insert Table 7 here]

5.2. Regression Analysis

In this section, we analyze the impact of VC ownership type and several other factors on the likelihood of successful exits (IPOs) in the multivariate setting. We start with competing risk

¹⁰ In unreported regressions, we also apply the multinomial logit models at both the round level and firm level as a robustness check. The empirical findings are in general consistent with the probit analysis. The results from the multinomial logit regressions are available upon request.

regression at the round level, where the failure event is IPO exit and the competing event is unsuccessful exit. Those that have not exited are treated as right censored. The dependent variable of the competing risk regression is the natural logarithm of time to an exit which is measured from the date of each round.

The independent variables of our key interest are the ownership type of the venture. Specifically, *Domestic Only at the Round Level* is equal to 1 if all the investors of a specific round are local VCs and 0 otherwise. *Joint Investment at the Round Level* is equal to 1 if at least one foreign VC and at least one local VC jointly invest in a financing round and 0 otherwise. The base group for comparison is the rounds invested by foreign VCs alone.

Other independent variables that may have an impact on venture exit performance are also included, for instance, dummies indicating the stage of investment that includes seed, early and expansion; the type of industry with computer, communication, semiconductor, biotechnology and medical/healthcare as the choices; the lead VC characteristics with independent VC, corporate VC, VC age, total investment experience, a dummy variable indicating whether the foreign VC has a branch office in Asia, and a measure of cultural distance. We further control for country legality and stock market development. Year and entrepreneurial firm country fixed effects are also used. The empirical results are reported in Table 8.

[Insert Table 8 here.]

Hazard ratios of the competing risk regression are reported. A hazard ratio of an independent variable smaller (greater) than 1 indicates a lower (higher) probability of IPO exit than the comparison group. The coefficient of *Domestic Only at the Round Level* is 0.994, slightly smaller than 1, while the coefficient of *Joint Investment at the Round Level* is 1.268, greater than 1. However, both are not statistically significant. Among other independent variables, we show that seed stage ventures are significantly less likely to succeed, while ventures with large investment size are more likely to succeed, consistent with the existing literature. In the case of foreign VCs, a branch office in Asia significantly increases the probability of IPO of their Asian portfolio companies, supporting *Hypothesis 4d* where establishing a branch office in the local area is an effective mechanism that helps foreign VCs to better process “soft” information and monitor local entrepreneurs, which has positive implications for the ventures’ performance.

In the second regression as shown in Table 8, we apply the probit regression to analyze the firm level exit performance, where the dependent variable is a dummy variable which is equal to 1 if the venture has successfully exited via IPO by the end of 2007, and 0 otherwise. Again, the independent variables of our key interest are the firm level ownership type. *Domestic Only at the Firm Level* is equal to 1 if the ventures are invested by local VCs through all rounds, and 0

otherwise. *Joint Investment at the Firm Level* is equal to 1 if the venture are invested by foreign VCs and local VCs jointly either in the same round or different rounds, and 0 otherwise. The base group for comparison is the ventures that are invested by foreign VCs alone through all rounds. Our other independent variables are similar to those used in the round level analysis except that the lead VC is defined as the one that invests the largest amount in the very first round and stage dummies indicate the stage of the venture when they receive the very first round.

As shown in Table 8, we find that at the firm level, ventures invested by foreign and local VCs jointly are more likely to succeed. Specifically, they are about 5% more likely to successfully exit as an IPO. This finding is consistent with *Hypothesis 4b*, indicating that the partnership with local VCs helps reduce the hurdles associated with information asymmetry and cultural disparity and thus facilitates the growth and development of the local ventures. Sorensen and Stuart (2001) and Hochberg et al (2007) show that syndication and networks help reduce frictions associated with distance and enhance exit performance in the U.S. market. We provide evidence that in the international venture capital investment, partnership with local VCs is an effective mechanism to overcome information and agency problems. Together with the insignificant coefficient of ownership type in the round level performance analysis, this finding also suggests that what matters for the performance of entrepreneurial firms is to have both foreign and local VCs on board to take advantage of both sides, not whether foreign and local VCs invest in the same round.

In addition, we show that in Asia, ventures in the semiconductor and medal/health care sectors are 4-7% more likely to go public successfully. Ventures that obtain larger amount of investment are significantly more likely to succeed, which is similar to the finding of U.S. venture capital investments. We also show that stock market development significantly and positively contributes to higher probability of IPO exit. This finding lends support to *Hypothesis 5b*.

In summary, the findings from Panel A of Table 8 suggest that the joint investment of foreign and local VCs at the firm level increases the likelihood of entrepreneurial firms' ultimate success. However, the ownership type of the local ventures in these emerging economies is not randomly determined. It is well established in the VC literature that VCs with more experience and broader networks are more likely to attract high-quality entrepreneurial firms and provide high-quality value-adding services to entrepreneurial firms (see, for example, Hellman and Puri, 2002; Hsu, 2004; Gompers et al., 2010). As we discuss and show earlier, foreign VCs have advantages over local VCs (in countries with less developed VC industry) in that they are often more experienced, more professionalized, and larger in size. These factors allow foreign VCs to attract the most talented entrepreneurs and the best quality ventures, which have important

implications for the ultimate success of the ventures. In other words, the better performance of ventures invested jointly by foreign and local VCs thus could be driven by the fact that they are of the best quality at the very beginning. To make sure our findings are not contaminated by this potential endogenous selection bias, we apply the propensity score matching methodology.

The propensity score matching has become popular in social studies to control for the endogeneity issues since the seminal work of Rosenbaum and Rubin (1983). The idea is we first estimate the conditional probability of a specific venture ownership type given the observable characteristics with a probit regression (see, our regressions in Tables 5 and 6). Then the conditional probability or the propensity score is estimated for each observation off the probit model. As a third step, we use various matching techniques, such as the nearest neighbor matching, radius matching, and the Kernel matching to form sub-groups of observations with different ownership type but with equal or close propensity scores.¹¹ Finally, we compute the likelihood of successful IPOs for these sub-groups. The differences in the likelihood of successful exit reflect the contribution to the success by different ownership type controlling for the endogeneity of selection. This set of results is provided in Panel B of Table 8.

As shown in Table 8, ventures jointly invested by foreign and local VCs consistently outperform those invested by local VCs alone and those invested by foreign VCs alone no matter which matching technique we apply. Specifically, ventures jointly invested by foreign and local VCs are about 5% more likely to go public than those invested by local VCs and those invested by foreign VCs alone. The findings of propensity score matching further underline the results from our multivariate regression analysis in Panel A of Table 8 that partnership between foreign and local VCs is an effective approach to deal with the information friction associated with both geographic and cultural distances when foreign VCs explore their investment opportunities in the international venture capital market.

6. Conclusions, Implications, and Limitations

In this paper we study the investment behavior of VCs while they pursue expansion outside their home locations, specifically, VCs from developed economies expanding their investments to the emerging Asian markets. Several interesting findings emerge from our studies. We believe these findings not only fill some of the voids in the existing literature on international venture capital investments, but also have helpful implications for foreign VCs, local entrepreneurs, and local policy makers. We discuss our major findings, their relation to the

¹¹ The technical details for the various matching methods are provided in STATA 11 manual.

existing literature, and their implications for practitioners and policy makers in great details below.

First, we show that foreign VCs play a noteworthy role in the Asian venture capital industry. During the sample period we study (1996-2006), foreign venture capital accounts for about 75% of the funding infused to the local entrepreneurial firms. As shown in the paper, on average, foreign VCs are more experienced and resourceful than the local VCs in the Asian markets we examine. These findings have several implications for the development of the venture capital industry in the emerging Asian economies. First of all, foreign VCs may help professionalize the local entrepreneurial firms given their experience of advising and nurturing ventures in their home countries. These firms may further have spillover effects on their fellow firms which are currently not financed by foreign venture capital. Second, the presence of foreign venture capital firms and their partnership with local VCs may help professionalize the local venture capital firms. This potentially includes but is not limited to, for instance, adopting standard venture capital contracts, more independent venture capital firms, better knowledge on advising and nurturing entrepreneurs, and better knowledge on constructing deals and taking firms to public on both the domestic markets and international markets. These topics invite further in-depth study in the future.

Second, we examine how the frictions associated with geographic distance and cultural disparity impact VCs' behavior when they explore their investment opportunities in unfamiliar territory. We observe that foreign VCs try to avoid investing in information opaque local firms when they are investing alone. Forming partnership with local VCs and establishing branch offices in the local areas effectively help reduce such frictions, which allow foreign VCs to leverage their resources and invest in more risky local ventures. However, the cultural distance is sometimes in the way of forming partnership between foreign and local VCs. To the best of our knowledge, our paper shows, for the first time, that information asymmetry and cultural disparity not only matters for foreign VCs to select and monitor local entrepreneurs, but also matters for finding trustworthy local partners and the effective cooperation between parties. We conjecture that hiring local talents would provide a practical solution to this issue as is found in other studies on service companies pursuing their international expansion. It is an interesting research question regarding how mechanisms, such as expatriating staff and hiring local talents, can effectively overcome hurdles related to information friction and cultural differences in international venture capital investments. The current paper does not test this issue due to data limitation. However, we believe this remains an important albeit unexplored area in international venture capital

investments. We tackle this issue using more detailed data hand-collected from the Chinese venture capital market in other projects.

Third, consistent with the existing literature, we confirm that the quality and development of the legal framework and stock markets are important factors that attract foreign venture capital. We further confirm that the stock market development is significantly and positively associated with the probability of IPO exits for the Asian entrepreneurial firms. In addition, we provide novel evidence on how these two factors impact the partnership between foreign and local VCs. Specifically, we show that the more investor protections provided by the local country, the more comfortable foreign VCs feel with investing by themselves, represented by a smaller need of forming partnership with local VCs.

Fourth, as predicted by our theory, we find that the entrepreneurial firms invested jointly by foreign and local VCs are more likely to successfully exit as IPOs, presumably because these firms not only enjoy the rich experience and resources brought with foreign VCs, but also have less frictions with investors given less information asymmetry and more effective communication with local VCs on board. Our results are found to be robust even after we control for the endogeneity of the selection between VCs and entrepreneurs using propensity score matching. Further, we show whether foreign and local VCs invest in the same round is not as important as the mere fact of having both of them on board. Our performance analysis focuses on only the IPO exits for the following reasons. First, IPOs, arguably, are the most successful exit strategy which brings investors and entrepreneurs highest possible financial returns. Second, the merger and acquisition data on private firms in the Asian market are not as reliable as the IPO data. Third, some sell outs are fire sales and can hardly be treated as successful exits. Our data does not allow us to differentiate these deals from more successful sellouts. Focusing on the IPO exits may overlook some successful M&A exits; however, we do not think it will impact our major conclusions.

One of the concerns, though, is the completeness and reliability of the dataset we use for this study. VentureXpert is one of a few databases that collect venture capital data in the Asian market. It is acknowledged that the database is quite comprehensive on covering the U.S. venture capital investments but has less developed coverage in Europe and Asia. Further, the foreign investments by U.S. VCs are likely better covered than those by VCs located in other developed economy. This introduces two potential biases in the data. First, U.S. VCs are over-presented in our sample. Second, entrepreneurial firms invested by small local VCs alone are likely to be missing in our sample. To improve the quality of our sample data, we focus our analysis on the relatively recent period (1996-2006) when foreign investments in the Asian markets we study are

more prevalent and the data collected by VentureXpert are of higher quality.¹² This helps mitigate the biases mentioned above, but probably will not completely eliminate them. The missing data on local firms invested by small local VCs shall not undermine our findings though. In fact, with them in our sample, some of our findings would be amplified. For instance, we would find even larger differences in terms of experience and resources between foreign and local VCs. To make sure our results are not driven by U.S. VCs, in unreported analysis, we exclude all U.S. VCs, and redo the analysis for the non-U.S. foreign VCs. Our major findings hold with such a sub-sample.¹³

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¹² The previous version of the paper studied a longer period from 1980-2006. The empirical results are qualitatively similar though.

¹³ These results are available upon request.

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Appendix: Definition of Variables

Variable Name	Definition
Startup/Seed	a dummy which is equal to 1 if the venture is at the startup/seed stage, and 0 otherwise
Early Stage	a dummy which is equal to 1 if the venture is at the early stage, and 0 otherwise
Expansion Stage	a dummy which is equal to 1 if the venture is at the expansion stage, and 0 otherwise
Computer Related	a dummy which is equal to 1 if the venture is in the computer-related industry, and 0 otherwise
Communication/Media	a dummy which is equal to 1 if the venture is in the communication/media industry, and 0 otherwise
Semiconductor	a dummy which is equal to 1 if the venture is in the semiconductor industry, and 0 otherwise
Biotechnology	a dummy which is equal to 1 if the venture is in the biotechnology industry, and 0 otherwise
Medical/Health Care	a dummy which is equal to 1 if the venture is in the medical/health care industry, and 0 otherwise
VC Firm Age	the difference between investment date and VC firm founding date, measured in years
N of Companies VC Invested	number of entrepreneurial firms that a VC firm had invested before
Round Size	the natural logarithm of total amount of capital raised in a specific round
Round 1	a dummy which is set to equal to 1 if it is the first round for a specific entrepreneurial firm, 0 otherwise
Independent VC	a dummy which is set to equal to 1 if the VC is an independent professional VC firm, 0 otherwise
CVC	a dummy which is set to equal to 1 if the VC is corporate venture capital firm, 0 otherwise
Seed or Early Stage Fund	a dummy which is set to equal to 1 if the VC fund specializes in investing in seed or early stage ventures, 0 otherwise
Ln(VC Firm Age)	the natural logarithm of VC firm age
Ln(Total investment experience)	the natural logarithm of the total number of entrepreneurial firms that a VC firm had invested before
Branch Office	a dummy which is equal to 1 if the foreign VC has a branch office established in the Asia area, and 0 otherwise
Cultural Distance	Hofstede cultural distance = $\frac{\left(\sum_{i=1}^4 (H_{VC,i} - H_{EF,i})^2\right)^{1/2}}{4}$, where $H_{VC,i}$ is the Hofstede measure of the lead VC's origin country on cultural dimension i , and $H_{EF,i}$ is the Hofstede measure of the entrepreneurial firm's country on cultural dimension i .
Country Legality Index	The value of legality is the weighted average following factors (based on Berkowitz et al., 2003, and Cumming et al., 2006): civil versus common law systems, efficiency of judicial system, rule of law, corruption, risk of expropriation, risk of contract repudiation, shareholder rights (as in La Porta et al., 1997, 1998). Higher value of legality index indicates “better” legal system.

Stock Market Development	the average of the three normalized indices, including Stock market capitalization/GDP, Total value of shares traded/GDP, and Total value of shares traded/stock market capitalization.
Foreign VC Participation: Round Level	a dummy which is set to equal to 1 if at least one foreign VC invested in a specific round, 0 otherwise
Joint Investment: Round Level	a dummy which is set to equal to 1 if at least one foreign VC and at least one local VC invested in a specific round, 0 if there is no local VC participation
Domestic Only: Round Level	a dummy which is equal to 1 if all VCs in a specific round are local, and 0 otherwise
Foreign VC Participation: Firm Level	a dummy which is set to equal to 1 if at least one foreign VC invested in an entrepreneurial firm, 0 otherwise
Joint Investment: Firm Level	a dummy which is set to equal to 1 if at least one foreign VC and at least one local VC invested in an entrepreneurial firm, 0 if there is no local VC participation
Domestic Only: Firm Level	a dummy which is equal to 1 if all VCs that invested in an entrepreneurial firm are local, and 0 otherwise
Ln(Total Amount Invested)	At the round level analysis, total amount invested refers to the round size; at the firm level analysis, total amount invested refers to the total amount invested from the very first round until exit

Table 1 Venture Capital Investments in Asia, 1996-2006

Panel A summarizes the distribution of number of rounds, number of ventures, amount of capital invested in billions of dollars (both from foreign VCs and local VCs), and mean/median round size in millions of dollars across the following emerging Asian countries, China (Mainland), Hong Kong, Taiwan, India, Singapore, South Korea. Panel B presents the foreign VCs' country origin. We categorize foreign VCs into three groups, Asian VCs cross investing, US VCs, and VCs from other countries. We summarize the number of VCs from each of the three areas, the number of rounds they participated in, the number of ventures they financed, and the total amount of capital they invested in billions of dollars.

Panel A: By venture country origin

	Number of Rounds	Number of Ventures	Amount of Capital (\$B)			Mean Round Size (\$M)	Median Round Size (\$M)
			Total	Foreign	Local		
China	581	418	9.1	8.1	1.0	15.5	5.5
Hong Kong	202	135	3.1	2.2	0.9	15.1	5.0
Taiwan	173	134	1.7	1.5	0.2	9.8	2.6
India	928	640	7.1	5.4	1.7	7.6	1.5
Singapore	266	169	4.6	3.0	1.6	17.3	2.9
South Korea	2,104	1,364	9.8	6.2	3.6	4.6	0.6
Total	4,254	2,860	35.4	26.4	9.0	8.3	1.1

Panel B: By VC country origin (Foreign venture capital)

	Number of VCs	Number of Rounds Participated	Number of Ventures Invested	Total Amount of Capital Invested(\$B)
Asia (Cross Investing)	147	501	431	6.6
US	247	1586	1157	17.9
Other	74	242	203	1.9

Table 2 Venture Capital Ownership Type

Panel A tabulate the number of financing rounds at the country level based on VC ownership type (foreign VCs alone, local VCs alone, and joint investment). Panel B summarizes the number of VC-backed entrepreneurial firms based on VC ownership type.

Panel A: Financing Rounds by Ownership Type

	Foreign		Local		Joint	
	N	%	N	%	N	%
China	384	66%	68	12%	129	22%
Hong Kong	116	57%	49	24%	37	18%
Taiwan	87	50%	47	27%	39	23%
India	265	29%	534	58%	129	14%
Singapore	163	61%	56	21%	47	18%
South Korea	145	7%	1,629	77%	330	16%
Total	1,160	27%	2,383	56%	711	17%

Panel B: Firm levels by Ownership Type

	Foreign		Local		Joint	
	N	%	N	%	N	%
China	249	60%	60	14%	109	26%
Hong Kong	68	50%	36	27%	31	23%
Taiwan	63	47%	35	26%	36	27%
India	180	28%	332	52%	128	20%
Singapore	86	51%	42	25%	41	24%
South Korea	69	5%	1,013	74%	282	21%
Total	715	25%	1518	53%	627	22%

Table 3 Characteristics of Local VCs and Foreign VCs

In this table, we compare characteristics of local VCs and foreign VCs that invest in Asian market, such as VC firm CUM (capital under management) (millions of dollars), VC firm age which is estimated as the difference between investment date and the found date of the VC firm, and VC firm investment experience measured as the number of entrepreneurial firms the VC has invested before a specific year. Median data are reported in parentheses under means. ***, **, and * denote whether the differences in means and medians are significant at 1%, 5%, and 10% confidence levels, respectively.

	Number of VC Firms		VC Firm CUM (\$M)		VC Firm Age		N of Companies VC Invested	
	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
China	56	233	307 (210)***	2157 (506)***	6*** (3)***	14*** (8)***	22 (11)***	197 (33)***
Hong Kong	48	95	714 (303)	3449 (300)	6** (4)**	13** (6)**	30 (15)***	358 (37)***
Taiwan	24	51	347 (120)***	5199 (565)***	12 (8)	12 (10)	33 (15)***	651 (48)***
India	70	136	251** (35)***	4217** (800)***	6*** (3)***	12*** (7)***	15 (7)***	279 (27)***
Singapore	38	98	585** (300)	2890** (650)	8** (6)**	15** (9)**	27 (14)***	401 (44)***
South Korea	107	87	151*** (41)***	4295*** (635)***	6*** (3)***	15*** (7)***	30* (15)***	379* (39)***

Table 4 VC Ownership Type and Venture Characteristics

In this table, we relate venture characteristics to ownership type at both the round level and at the firm level. Specifically, we examine round number, stage, and industry of the local entrepreneurial firms. In Panel C, we also summarize the average round size and the total number of rounds firms received conditional on VC ownership type. *p*-values of F-tests for cross-group differences in means are provided in the last column. ***, **, and * denote statistical significance at 1%, 5%, and 10% confidence levels, respectively.

Panel A: Round Level Analysis

	Foreign		Local		Joint		F-test p-value
	N	%	N	%	N	%	
Round							
Round 1	721	62%	1,802	76%	496	70%	0.000***
Round 2	231	20%	400	17%	138	19%	0.036**
Round 3 and plus	208	18%	181	8%	77	11%	0.000***
Stage							
Startup/Seed	87	8%	326	14%	79	11%	0.000***
Early Stage	226	19%	599	25%	211	30%	0.000***
Expansion	619	53%	1,280	54%	324	46%	0.000***
Later Stage	228	20%	178	7%	97	14%	0.000***
Industry							
Computer Related	362	31%	704	30%	246	35%	0.001***
Communication/Media	218	19%	425	18%	152	21%	0.015**
Semiconductor	119	10%	373	16%	113	16%	0.000***
Biotechnology	7	1%	106	4%	41	6%	0.000***
Medical/Health Care	47	4%	93	4%	22	3%	0.361
Non-technology	407	35%	682	29%	137	19%	0.000***

Panel B: Company Level Analysis

	Foreign		Local		Joint		F-test
	N	%	N	%	N	%	p-value
Stage when receiving first round financing							
Startup/Seed	62	9%	249	16%	101	16%	0.000***
Early Stage	148	21%	430	28%	210	33%	0.000***
Expansion	384	54%	740	49%	252	40%	0.000***
Later Stage	121	17%	99	7%	64	10%	0.000***
Industry							
Computer Related	227	32%	479	32%	237	38%	0.000***
Communication/Media	116	16%	269	18%	136	22%	0.000***
Semiconductor	68	10%	217	14%	90	14%	0.002***
Biotechnology	4	1%	69	5%	32	5%	0.000***
Medical/Health Care	26	4%	59	4%	19	3%	0.410
Non-technology	274	38%	425	28%	113	18%	0.000***

Panel C: Investment Size---Company Level Analysis

	Foreign		Local		Joint		F-test
	Mean	Median	Mean	Median	Mean	Median	p-value
N of Rounds Company Received	1.6	1.0	1.3	1.0	1.9	1.0	0.000***
Average Round Amount (\$M)	16.6	5.3	2.4	0.6	11.4	2.9	0.000***
Total Amount Invested in Company (\$M)	25.4	7.5	2.9	0.7	22.6	4.4	0.000***

Table 5 VC Ownership Type and Investment Criteria, Round Level Analysis

In this table, we use probit regressions to investigate whether there is systematic difference in investment criteria across VC ownership types at the round level. The dependent variable of the first regression is a dummy which is set to equal to one if at least one foreign VC participates a specific financing round and 0 otherwise. The dependent variable of the second regression is a dummy which is set to equal to one if at least one foreign VC and at least one local VC participate a specific round and zero if there is no local VC participation. All regressions include entrepreneurial firm country fixed effect and year fixed effect. Definitions of other independent variables are provided in Appendix. The marginal effects (probabilities), labeled as ME, are also reported for each independent variable. ***, **, and * represent significance at the 1%, 5%, and 10% confidence levels, respectively.

	Foreign VC Participation vs. Local VCs Alone		Joint Investment vs. Foreign VCs Alone	
	(1)	ME	(2)	ME
Intercept	-8.748*** (0.000)		1.958*** (0.004)	
Round				
Round Size	0.635*** (0.000)	0.253	0.137*** (0.000)	0.036
Round 1	-0.114* (0.076)	-0.045	0.021 (0.818)	0.005
Stage				
Startup/Seed	-0.323*** (0.009)	-0.126	0.256 (0.170)	0.073
Early Stage	-0.146 (0.163)	-0.058	0.366** (0.014)	0.104
Expansion Stage	-0.179* (0.054)	-0.071	0.083 (0.514)	0.022
Industry				
Computer Related	0.184** (0.015)	0.073	0.238** (0.041)	0.064
Communication and Media	0.152* (0.078)	0.061	0.145 (0.263)	0.039
Semiconductor	0.008 (0.937)	0.003	0.394** (0.011)	0.117
Biotechnology	-0.006 (0.974)	-0.002	0.943*** (0.003)	0.327
Medical/Health Care	-0.058 (0.695)	-0.023	0.174 (0.477)	0.049
Lead VC Characteristics				
Independent VC	0.894*** (0.000)	0.345	-0.146 (0.241)	-0.039
CVC	0.647*** (0.000)	0.251	0.240 (0.176)	0.068
Seed or Early Stage Fund	-0.167** (0.011)	-0.066	0.055 (0.709)	0.015
Ln(VC Firm Age)	0.195*** (0.000)	0.077	-0.065 (0.387)	-0.017

Ln(Total investment experience)	0.305*** (0.000)	0.121	0.229*** (0.000)	0.060
Branch Office in Asia			0.261 (0.343)	0.075
Cultural Distance			-0.021* (0.075)	-0.005
<i>Other Control Variables</i>				
Country Legality Index	0.305*** (0.000)	0.121	-0.217*** (0.000)	-0.056
Stock Market Development	0.742*** (0.000)	0.295	-0.331 (0.167)	-0.086
Year Fixed Effect	Yes		Yes	
Entrepreneurial Firm Nation Fixed Effect	Yes		Yes	
N	4065		1415	
Pseudo R ²	54.00%		24.09%	

Table 6 VC Ownership Type and Investment Criteria, Firm Level Analysis

In this table, we use probit regressions to investigate whether there is systematic difference in investment criteria across VC ownership types at the firm level. The dependent variable of the first regressions is a dummy which is set to equal to one if at least one foreign VC invested in a local entrepreneurial firm and 0 otherwise. The dependent variable of the second regressions is a dummy which is set to equal to one if at least one foreign VC and at least one local VC invested in a local entrepreneurial firm and zero if there is no local VC participation. All regressions include entrepreneurial firm country fixed effect and year fixed effect. Definitions of other independent variables are provided in Appendix. The marginal effects (probabilities), labeled as ME, are also reported for each independent variable. ***, **, and * represent significance at the 1%, 5%, and 10% confidence levels, respectively.

	Foreign VC Participation vs. Local VCs Alone		Joint Investment vs. Foreign VCs Alone	
	(1)	ME	(2)	ME
Intercept	-6.542*** (0.000)		4.090*** (0.000)	
<i>Stage at the first round</i>				
Startup/Seed	-0.733*** (0.000)	-0.273	0.480*** (0.008)	0.183
Early Stage	-0.411** (0.000)	-0.161	0.235 (0.132)	0.093
Expansion Stage	-0.434*** (0.000)	-0.172	-0.083 (0.554)	-0.033
<i>Industry</i>				
Computer Related	0.159** (0.048)	0.063	0.400*** (0.001)	0.157
Communication and Media	0.253*** (0.006)	0.101	0.381*** (0.006)	0.148
Semiconductor	0.036 (0.738)	0.014	0.572*** (0.001)	0.214
Biotechnology	0.007 (0.969)	0.003	0.851** (0.019)	0.294
Medical/Health Care	-0.136 (0.393)	-0.054	0.350 (0.152)	0.135
<i>Lead VC Characteristics</i>				
Independent VC	0.821*** (0.000)	0.319	-0.198* (0.092)	-0.078
CVC	0.551*** (0.000)	0.215	0.145 (0.425)	0.057
Seed or Early Stage Fund	-0.272*** (0.000)	-0.108	-0.102 (0.454)	-0.041
Ln(VC Firm Age)	0.287*** (0.000)	0.114	0.336*** (0.000)	0.134
Ln(Total investment experience)	0.182*** (0.000)	0.073	0.013 (0.581)	0.005
Branch Office in Asia			-1.329*** (0.000)	-0.471
Cultural Distance			-0.110*** (0.000)	-0.044

<i>Other Control Variables</i>				
Country Legality Index	0.282*** (0.000)	0.112	-0.189*** (0.000)	-0.075
Stock Market Development	0.432*** (0.004)	0.172	0.020 (0.937)	0.008
Year Fixed Effect	Yes		Yes	
Entrepreneurial Firm Nation Fixed Effect	Yes		Yes	
N	2695		1210	
Pseudo R ²	35.82%		35.93%	

Table 7 VC Ownership Type and Ventures' Ultimate Exits (Firm Level)

In this table, we examine whether ventures had exited via an IPO by the end of 2007. Because it typically takes 5-6 years for VCs to exit from their investments, to avoid the potential bias, we exclude ventures that obtained their first round of financing after the end of 2002. This leaves us 2101 ventures.

	Foreign VCs Only				
	N of Ventures	N of IPOs	%	N of Foreign IPOs	%
China	71	8	11%	5	63%
Hong Kong	58	5	9%	1	20%
Taiwan	51	9	18%	1	11%
India	83	7	8%	1	14%
Singapore	65	3	5%	0	0%
South Korea	55	5	9%	1	20%
	Domestic VCs Only				
	N	N of IPOs	%	N of Foreign IPOs	%
China	46	1	2%	0	0%
Hong Kong	27	3	11%	0	0%
Taiwan	31	8	26%	0	0%
India	274	19	7%	0	0%
Singapore	28	1	4%	0	0%
South Korea	847	34	4%	0	0%
	Joint Investments				
	N	N of IPOs	%	N of Foreign IPOs	%
China	34	8	24%	7	88%
Hong Kong	29	3	10%	2	67%
Taiwan	20	3	15%	0	0%
India	99	18	18%	1	6%
Singapore	36	1	3%	0	0%
South Korea	247	15	6%	1	7%

Table 8 The Impact of VC Ownership Type on the Likelihood of IPOs

In this table, we analyze the impact of VC ownership type on the likelihood of successful exits (IPOs). We start with competing risk regression at the round level, where the failure event is IPO exit and the competing event is unsuccessful exit. Those that have not exited are treated as right censored. The dependent variable of the first regression is the natural logarithm of time to an exit which is measured from the date of each round. The dependent variable of the second regression is a dummy which is equal to 1 if the venture has exited as an IPO by the end of 2007, and 0 otherwise. *Domestic Only* is a dummy which is equal to one if in a specific round all participating VCs are local, 0 otherwise. *Joint Investment* is a dummy which is equal to one if at least one foreign VC and at least one local VC participate in a specific round. The base group for comparison is the rounds invested by foreign VCs alone. Hazard ratios instead of coefficients are reported. The second regression is a probit regression at the firm level on the probability of IPO exit. Because it typically takes 5-6 years for VCs to exit from their investments, to avoid the potential bias, we exclude ventures that obtained their first round of financing after the end of 2002. *Domestic Only Firm Level* is a dummy which is set to equal to one if all VCs invested in the venture are local and 0 otherwise. *Joint Investment Firm Level* is a dummy which is set to equal to one if at least one foreign VC and at least one local VC invested in a local entrepreneurial firm and 0 otherwise. The marginal effects (probabilities), labeled as ME, are also reported. Both regressions include year fixed effect and entrepreneurial firm nation fixed effect. Definitions of other independent variables are provided in Appendix. In Panel B, we conduct the propensity score matching analysis on the differences in the probability of IPO conditional on ownership types, which controls for the endogeneity of companies receiving foreign VC investments. We report the results using three different matching methods, including nearest neighbor matching, radius matching, and kernel matching. The t-statistics based on bootstrapped standard errors are reported in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% confidence levels, respectively.

Panel A: Regression Analysis

	Competing Risk Regression----		
	Round Level Analysis	Probit Regression----	Firm Level Analysis
	(1)	(2)	ME
Intercept		-1.237 (0.132)	
<i>Ownership Type</i>			
Domestic Only: Round Level	0.994 (0.983)		
Joint Investment: Round Level	1.268 (0.237)		
Domestic Only: Firm Level		0.245 (0.283)	0.023
Joint Investment: Firm Level		0.402** (0.019)	0.048
<i>Stage</i>			
Seed	0.201*** (0.000)	-0.763*** (0.000)	-0.051
Early	0.684 (0.125)	-0.369** (0.033)	-0.032
Expansion	1.090 (0.677)	-0.239 (0.129)	-0.023
<i>Industry</i>			
Computer Related	1.193	0.052	0.005

	(0.335)	(0.702)	
Communication and Media	0.788	0.028	0.003
	(0.287)	(0.852)	
Semiconductor	1.176	0.345**	0.042
	(0.480)	(0.031)	
Biotechnology	1.085	-0.078	-0.007
	(0.852)	(0.792)	
Medical/Health Care	1.721*	0.567**	0.077
	(0.080)	(0.016)	
<i>Lead VC Characteristics</i>			
Independent VC	0.772	-0.020	-0.002
	(0.136)	(0.863)	
CVC	0.925	-0.196	-0.017
	(0.737)	(0.215)	
Ln(VC Firm Age)	0.916	-0.002	-0.000
	(0.388)	(0.973)	
Ln(Total investment experience)	1.080	0.022	0.002
	(0.172)	(0.487)	
Branch Office in Asia	1.769**	0.242	0.028
	(0.010)	(0.487)	
Cultural Distance	0.995	-0.002	-0.001
	(0.716)	(0.822)	
<i>Other Control Variables</i>			
Ln (Total Amount Invested)	1.310***	0.187***	0.018
	(0.000)	(0.000)	
Country Legality Index	1.027	-0.058	-0.006
	(0.709)	(0.218)	
Stock Market Development	1.591	0.527**	0.052
	(0.202)	(0.014)	
Year Fixed Effect	Yes	Yes	
Entrepreneurial Firm Nation Fixed Effect	Yes	Yes	
<hr/>			
N		2101	
Pseudo R ²		11.68%	
Log Pseudolikelihood	-1818.04		
Wald Chi2	271.63		
Prob > Chi2	0.000		
<hr/>			

Panel B: Propensity Score Matching

Propensity Score Matching Methods	Difference in the Probability of IPO		
	Foreign Alone vs. Domestic Alone	Joint vs. Domestic Alone	Joint vs. Foreign Alone
Nearest Neighbor Matching	0.025 (1.075)	0.052*** (2.874)	0.055* (1.730)
Radius Matching	0.039** (2.291)	0.050*** (3.109)	0.052** (2.078)
Kernel Matching	0.019 (0.899)	0.049*** (3.082)	0.053* (1.830)