RETURNEES VERSUS LOCALS: WHO PERFORM BETTER IN CHINA'S TECHNOLOGY ENTREPRENEURSHIP?

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We examine performance differences between new ventures led by returnees and those led by their local counterparts in China. We argue that while, compared with locals, returnees have the advantages of higher education and overseas experience, they also have disadvantages in their home country in terms of lack of both local connections and local knowledge. Since returnees' effect on venture performance is the net effect of their advantages and disadvantages, contextual factors that can help them overcome their disadvantages should improve their ventures' performance. With a sample of new technology ventures in China, we find strong support for this argument. Copyright © 2012 Strategic Management Society.

INTRODUCTION

With the globalization of markets and the liberalization of the transnational movement of skilled labor, scholars from several disciplines have paid increasing attention to the importance of returnees—people who had studied and/or worked in other countries (typically in developed countries such as the U.S.) and then returned to their home countries—in the economic development of emerging markets (Borjas and Bratsberg, 1996; Gmelch, 1980; Harvey, 2009; McCormick and Wahba, 2001; Saxenian, 2006). Because of the perceived opportunities now offered in emerging markets, migrants from these markets (e.g., in particular, China and India) are likely to return to their home countries (Harvey, 2009). It has been argued that returnees, with their advanced tech-

nological and managerial skills accumulated in the developed countries, will help fill important entrepreneurial and technological gaps in emerging markets (*The Economist*, 2011; Qin, 2007; Saxenian, 2006)—a process Saxenian (2006) refers to as 'brain circulation.'

Prior research in this area, based on the disciplines of economics, sociology, and anthropology, has mainly focused on which groups of migrants would return or have returned to their home countries and why (Borjas, 1987; Borjas and Bratsberg, 1996; Gmelch, 1980; Harvey, 2009; Vanhonacker, Zweig, and Chung, 2006). Recently, management scholars have started to examine the organizational consequences of returnees and have shown that technology ventures founded by returnees tend to have higher levels of export intensity and better innovation performance than those founded by locals (e.g., Filatotchev *et al.*, 2009; Liu *et al.*, 2010). While highlighting the advantages of returnees, these studies were silent on the potential challenges returnees may face that could limit their effective-

ness in technology entrepreneurship. For example, after years of living abroad, returnees may have limited connections with important local constituents in their home countries. In addition, they may not have a good understanding of social, cultural, and institutional changes as well as how business works in their home country. These disadvantages can limit the effectiveness of returnees in technology entrepreneurship because, in emerging markets where strategic factor markets are not well developed, local connections and local knowledge are crucial for doing businesses (Li and Atuahene-Gima, 2001, 2002; Peng and Luo, 2000; Zhang and Li, 2010). So far, however, there has been no systematic research on returnees' disadvantages and, more importantly, how their disadvantages may affect their value in technology entrepreneurship.

To address this critical gap in the literature, we examine performance differences between new technology ventures led by returnees and those led by locals in China's high technology industries. For the purpose of this study, a technology venture led by a returnee leader refers to one whose 'legal representative' is a returnee, and a venture led by a local refers to one whose legal representative is a local. According to China's 'General Principles of The Civil Law' (Article 38), a firm's legal representative is the responsible person who acts on behalf of the firm in exercising its functions and power.[1] Thus, the 'legal representative' is a key executive position of a technology venture in China. By focusing on this key position, we are able to examine the effectiveness of returnees relative to their local counterparts in technology entrepreneurship.

Since returnee leaders have advantages and disadvantages relative to their local counterparts, their overall impact on new venture performance is the net effect of their advantages and disadvantages. Because we cannot predict the relative magnitude of their advantages and disadvantages, it is difficult to predict *ex ante* whether the net effect would be positive or negative. Instead, we argue that since the effect returnee leaders have on venture performance is the net effect of their advantages and disadvantages, contextual factors that help them overcome

their disadvantages should improve their ventures' performance relative to those led by locals by either the net positive effect becoming greater or the net negative effect becoming smaller. In this study, we focus on two such contextual factors: state controlling ownership in a venture and the venture's age. Considering the important role of the government in China, we expect that the involvement of the government through state controlling ownership will mitigate returnees' disadvantage in terms of lack of local connections and local knowledge. Also, because returnees can build local connections and have a better understanding of how business works over time, as new ventures age, returnees' disadvantages will diminish.

To test these arguments, we analyze four performance dimensions (employment size, sales, profit, and survival) of new technology ventures founded from 1995 to 2003 in China's largest technology cluster—Zhongguanchun Science Park (ZSP).[2] Our results suggest that, on average, new technology ventures led by returnees underperform those led by locals, but state controlling ownership and older venture age help narrow performance gaps. Our findings contribute to the nascent literature on returnees in technology entrepreneurship in emerging markets by examining how contextual factors may reduce or amplify their advantages versus disadvantages.

RESEARCH HYPOTHESES

Advantages and disadvantages of returnees in China's new technology ventures

According to the liability of newness perspective, new ventures tend to have higher failure rates because they often have limited resources and have not yet established stable links to clients, supporters, and customers (Eisenhardt and Schoonhoven, 1990; Stinchcombe, 1965). Among those that survive, disparity in the degree of their success is often enormous: some grow into industry leaders while many others remain as surviving, yet small, firms (Eisenhardt and Schoonhoven, 1990). The highly dynamic markets and technological changes typical of technology industries add yet further challenges to new

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[1] China's 'Company Law' (Article 13) further clarifies that 'The legal representative of a company shall, according to the provisions of its articles of association, be assumed by the chairman of the board of directors, executive director or manager, and shall be registered according to law' (Source: http://www.saic.gov.cn/wzj/zcfg/fl/200610/t20061026_51872.html). For the sake of simplicity, we use returnee leaders and returnee legal representatives interchangeably throughout the article.

[2] Our data cover the period of 1995 to 2003. To eliminate the left censor problem, we didn't include ventures founded prior to 1995 in our analyses. All ventures in our sample during this time period were eight years old or younger.

technology entrepreneurs. Previous studies show that managers' human capital (such as their technological and managerial skills) and social capital (such as their ties with external constituencies) are instrumental in helping new technology ventures not only overcome resource constraints but also exploit external opportunities (Eisenhardt and Schoonhoven, 1990; Li and Zhang, 2007; Starr and MacMillan, 1990). Building upon this stream of research, we investigate performance differences between new technology ventures led by returnee leaders and those led by their local counterparts.

Relative to their local counterparts, returnee leaders have both advantages and disadvantages. Among their advantages, returnees, particularly in technology fields, have often acquired superior knowledge and skills through the scientific and technical training they received in developed countries. For example, in China's ZSP, 38 percent of returnees have a PhD, 45 percent have a master's degree, and 57 percent already hold patents (Zhang, 2008a). In Shanghai, of the more than 30,000 returnees starting a business, 90 percent hold either a PhD or a master's degree from an overseas institution (Kaufman, 2003). Vanhonacker *et al.* (2006) found that 80 percent of returnees in their study have a technology that is new for China, giving returnees competitive advantage in the domestic market. Furthermore, experiences in both developed countries and their home countries expose returnees to the technological and business practice gaps between these country contexts; exposure to these gaps is important because emerging markets generally follow developed countries in their economic and technology development (Batjargal, 2007). Returnees' exposure to the gaps makes them able to identify entrepreneurship and innovation opportunities. For example, most of the leading Internet companies in China— including Baidu (China's Google), Sina (the largest portal Web site), Sohu (China's Yahoo, the second largest portal Web site), and Dangdang (China's Amazon)—were founded by returnees that imitated U.S. Internet companies (Zhang, 2008a). Thus, returnees can contribute to the performance of technology ventures by identifying and capitalizing upon brokerage opportunities.

Nonetheless, returnees have distinct disadvantages as well. When they return to their emerging market home countries, they face a seemingly familiar, yet different, environment. Because of social, cultural, and institutional changes that occur in their absence, they may not have an accurate or comprehensive understanding of the market, society, or how to conduct business there—knowledge that is critical for leading successful firms. Likewise, the home country environment is different from that of developed countries where returnees accumulated their education and work experience. Often, a lack of well-established institutional frameworks and underdeveloped strategic factor markets characterize institutional contexts in emerging markets (Hoskisson *et al.*, 2000; Li and Atuahene-Gima, 2002): characteristics that may limit the appropriation of returnees' technological and managerial skills. As Zhou and Hsu (2011: 416) noted that 'returnees coming from well-established business environments may be . . . more vulnerable if such local eco-systems are not in place.' This dearth of institutional frameworks and strategic factor markets makes connections with important local constituents essential, as they represent important channels for accessing information and resources (Li and Zhang, 2007; Peng and Luo, 2000). As Xin and Pearce (1996) argued, connections can work as substitutes for formal institutional support in emerging markets. In examining new ventures in China, Li and Zhang (2007) found a positive relationship between managers' connections with government officials and venture performance. Relative to their local counterparts, returnees typically have limited connections with critical local constituents in their home countries; after years of living out of their home countries, they have missed opportunities to build their local connections and may have lost old contacts (Qin, 2007). Thus, returnees' disadvantages in terms of lack of local connections and local knowledge can adversely affect the performance of their ventures.

Since returnee leaders have advantages and disadvantages relative to their local counterparts, their effect on venture performance is the net effect of their advantages and disadvantages. If a contextual factor can reduce the magnitude of a returnee leader's disadvantages, it should improve his/her net effect on venture performance. In this study, we examine the effects of two contextual factors: state controlling ownership in a technology venture and the age of a venture. We argue that these two factors can help mitigate the disadvantages of returnee leaders in terms of lack of local knowledge and local connections and, therefore, improve the performance of their ventures relative to those led by locals. In the following sections, we develop our hypotheses in details.

The contingent effect of state controlling ownership

In our research context of China, government remains a critical influence on strategic resource allocations (Li and Atuahene-Gima, 2001). As such, the extent of the links between a firm and the government is a crucial issue with important implications. As Walder (1992) argued, at the center of the institutional arrangements in emerging markets such as China are various types of institutional linkages between firms and political authorities, especially in the form of different property right relationships. Simply, firms closely linked with the government have institutional and resource advantages compared with those without close links with the government (Tan, Li, and Xia, 2007).

While institutional and resource advantages offered by the government are useful to all ventures, they are particularly important to those led by returnees because returnees lack local knowledge and local connections. As Qin (2007) noted, after years of living outside of their home countries, many returnees find themselves largely uprooted from the social contexts in China. Because of the important role of government in China, new technology ventures that grant the state controlling ownership provide the optimal platform for returnee leaders to connect with important local constituents and gain local knowledge. Prior research has shown that new ventures can gain legitimacy and status via affiliation with prominent exchange partners (Stuart, Hoang, and Hybels, 1999). State controlling ownership in a venture represents the state's endorsement of the venture; an endorsement that can help build the legitimacy and status of the venture in the eyes of external parties and help a returnee leader connect with important local constituents. The involvement of the state also provides a favorable platform for the returnee leaders to observe and understand the institutional changes that may have occurred in their home country in their absence. As noted by Solinger (1991), returnees may rely on government ties precisely because they lack the social ties that facilitate competition in China's personalized market.

Moreover, state controlling ownership can provide critical resources that complement the advantages returnee leaders have achieved via higher education and associated human capital. As we have noted, underdeveloped strategic factor markets in China limit access and acquisition of critical complementary resources. When local eco-

systems are not well developed, returnee leaders may have difficulty putting their technological and managerial skills to good use to create value for their firms. Technology ventures with state controlling ownership are closely associated with government authorities and often considered 'insiders' in China's institutional system;[3] they can assemble necessary complementary resources more easily and in a timely and cost-effective manner. Bundled with these complementary resources, returnee leaders' technological and managerial skills are more likely to create value for their ventures.

Returnee leaders' overseas experience may also be important to new technology ventures with state controlling ownership because of the characteristics of these ventures. While state controlling ownership provides a venture with 'insider' status in China's institutional system, this status may bring disadvantages to the venture as well. For example, overseas stakeholders (such as suppliers, customers, and potential alliance partners) may view state-controlled technology ventures with suspicion. These overseas stakeholders may be concerned with whether the state plans to use the technologies acquired or developed by the ventures for political or military purposes. Therefore, being an 'insider' in China's institutional system may, in fact, exclude a venture from overseas business networks in the industry. Returnee leaders' overseas experience can serve to bridge these two otherwise separate networks and help state-controlled ventures explore overseas business opportunities. Conversely, potential foreign investors and partners may need returnee leaders in order to link with state-controlled ventures, as these ventures typically represent less familiar territories and, in the past, may have even been 'closed' territories for them.

In summary, we argue that state controlling ownership can help returnee leaders mitigate their disadvantages. As such, the net effect of their advantages and disadvantages on venture performance, relative to their local counterparts, will be improved (either the net positive effect becomes greater or the net negative effect becomes smaller). Thus,

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[3] In China, 'insiders' of the institutional system refers to individuals (e.g., government officials, civil servants) or organizations (e.g., state-owned firms) that are associated with and, thus, receive fiscal support from the state. 'Outsiders' of the institutional system refer to those individuals (e.g., private entrepreneurs) and organizations (e.g., private and foreign firms) that are not able to obtain fiscal support from the state.

Hypothesis 1 (H1): State controlling ownership will improve the performance of new technology ventures with returnee leaders relative to ventures with local leaders.

The contingent effect of venture age

In addition to mitigation of disadvantages via state controlling ownership, we expect that working with older technology ventures will also mitigate the disadvantages in terms of lack of local connections and local knowledge of returnee leaders. As noted earlier, a lack of stable links to clients, supporters, and customers often fuels the liability of newness of new ventures (Eisenhardt and Schoonhoven, 1990; Stinchcombe, 1965). The literature suggests that personal connections of top managers can help new ventures build connections with important external constituents (Gulati and Higgins, 2003; Li and Zhang, 2007). However, in our research context, returnee leaders typically have few local connections. Thus, it is difficult for new ventures to rely on their returnee leaders' local personal connections to overcome their liability of newness. This is especially the case for very young technology ventures, as returnee leaders' lack of local connections and the ventures' lack of stable links with external partners can amplify one another. As a new venture ages, it builds its track record and external exchange relationships, thus reducing its dependence on the personal connections of its leaders. Therefore, the aging of new ventures mitigates the disadvantage of returnee leaders' lack of local connections.

In addition, the performance record of an older venture can facilitate a returnee leader to build connections with local constituents—even if the leader was not with the venture as the ventures aged. According to Chen and Chen (2004), fundamental to successful relationship building are mutual self-disclosure and dynamic reciprocity. The performance histories of older ventures enable returnee leaders to demonstrate the ventures' quality, but their own quality as well, thus helping build trust between the leaders and important local constituents. Furthermore, interactions with exchange partners over time allow dynamic reciprocity to occur—that is, offering a favor to be repaid later. The dynamic reciprocity of older ventures with their exchange partners enables venture leaders to build/cement connections with exchange partners. Moreover, although returnee leaders tend to lack a comprehensive understanding of social and business issues, they can develop such local knowledge over time as their ventures age. Even if they were not with the ventures as the ventures aged, the ventures' prior business transactions (successful as well as failed) and the local knowledge embedded in the ventures provide a roadmap for returnee leaders to obtain such local knowledge. For these reasons, we propose:

Hypothesis 2 (H2): Older venture age will improve the performance of new technology ventures with returnee leaders relative to ventures with local leaders.

METHOD

Research setting and data

We tested our hypotheses with data on all technology ventures from 1995 to 2003 in the Zhongguancun Science Park (ZSP) in Beijing, China. Established in 1988, ZSP is the largest technology cluster in China and it offers many preferential policies to ventures in technology industries, including tax reduction, facility and land use rights, and import privileges, among others (Zhang, Li, and Schoonhoven, 2009). For example, firms in the ZSP pay an income tax of 15 percent—less than half the normal tax rate of 33 percent. Additionally, the ZSP waives taxes for new entrants for the first three years and requires payment of only 50 percent over the subsequent three years.

Because the primary purpose of the ZSP is to promote technological innovation, the ZSP allows only qualified firms to enter the zone. To qualify for entry, a firm must be certified as 'high tech' using standards evaluated by the ZSP Administrative Committee including: (1) business activities conducted in targeted technology industries; (2) a top management team composed of engineers or scientists; (3) a minimum of 20 percent of employees with college degrees; and (4) at least 3 percent of sales dedicated to research and development (Li and Atuahene-Gima, 2001). The Administrative Committee reviews and renews the high-tech status of the ZSP ventures on an annual basis. For this qualification review, the ZSP Administrative Committee requires each firm to submit an annual report disclosing detailed information about the firm's output, capital, employment, ownership, etc. The ZSP Administrative Committee collects and reviews the annual report of each firm.

We compiled the data used in this study from the annual reports filed by all certified firms in the ZSP

from 1995 to 2003. We did not use data prior to 1995 because those data were sparse and the reports used different formats, which made comparison difficult. Further, we dropped ventures founded prior to 1995 from our analyses to eliminate the left censor problem. Consistent with the definition of new ventures used in previous studies (e.g., Li and Atuahene-Gima, 2001; Li and Zhang, 2007), the maximum age of the ventures in our study period (1995 to 2003) was eight years old (nine years observations with age ranging from zero to eight). Our data allowed us to examine these ventures' performance in their early histories (from founding to up to eight years). Our sample consisted of 33,290 venture-year observations of 13,163 ventures.[4]

Measurements of key variables

As noted earlier, we examined four performance dimensions of technology ventures, including employment size, sales, profit, and survival. Eisenhardt and Schoonhoven (1990) used technology ventures' annual sales as an outcome variable. They argued that because sales at founding were zero for all firms, a firm's sales in a year reflect its sales growth since founding—a common starting point for all new ventures. Following their logic, we examined venture employment size, sales, and profit in a year.[5] These measures captured the absolute changes (i.e., growth) in employment, sales, and profit of each venture from its founding. More specifically, we measured *employment size* as the natural logarithm of the number of employees in a venture in a year; *sales* as the natural logarithm of the total sales (in thousand RMB) of a venture in a year; and *profit* as the natural logarithm of the total profit of a venture in year. In addition, we also examined venture survival by creating a variable of *exit*. We coded *exit* as '1' for a venture in year *t* if the venture appeared in the data set for year *t* but not for year *t + 1*, and as '0' (i.e., survival) otherwise. We treated all venture-year observations in 2003 (the last year of our research period) as right censored in the survival analysis.

Returnees venture was coded as a dummy variable equal to '1'; if a venture's legal representative was a returnee in a year and '0' otherwise. In our sample, 9.3 percent of venture-year observations had a returnee as the legal representative of the firm. *State controlling ownership* was coded as a dummy variable equal to '1' if the state had absolute controlling ownership (i.e., the state owned 50 percent or more of a venture's equity) or the relative controlling ownership (i.e., the state was the largest shareholder of a venture even though the state's ownership was less than 50 percent)[6] and '0' otherwise. In our sample, 17.3 percent of venture-year observations had state controlling ownership. *Venture age* was measured as the number of years since a venture was founded. The average venture age was 1.85 years. All variables, including controls (discussed next), were updated yearly.[7]

Controls

We controlled for several variables that could affect the performance of technology ventures. First, considering the importance of R&D investment in technology ventures, we controlled for the natural logarithm of the amount of *R&D investment* (in thousand RMB) in a venture in a year. Second, while most ventures in the ZSP were registered as domestic firms, some were registered as foreign firms. To account for possible differences between domestic and foreign ventures, we created a dummy variable—*foreign-owned venture*—coded as '1' if a venture was registered as a foreign firm and '0' otherwise. In our sample, 12.8 percent of venture-year observations were registered as foreign-owned firms.

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[4] Before dropping ventures founded before 1995, our data had 56,719 venture-year observations of 18,064 ventures from 1995 to 2003. Our final sample represented 73 percent of the ventures and 59 percent of the venture-year observations.

[5] In addition, because all sales and profits were initially zero and, for many technology ventures were zero in subsequent years as well, percentage growth could not be computed from founding. But the growth measures we used are 'computationally tractable' (Eisenhardt and Schoonhoven, 1990: 516).

[6] The database did not have information on the number or share of equities of a venture owned by the state. It has information on whether the state had the absolute controlling ownership or the relative controlling ownership in a venture. We first created one dummy for ventures with absolute state controlling ownership and one for ventures with relative state controlling ownership. We found that these two dummies had consistent effects so that we combined them into one dummy. We acknowledge this measure is coarse. If data are available, future studies should validate our results with the actually percentage of state ownerships in technology ventures.

[7] We did not lag the independent variables in our models. Lagging the independent variables by one year means that a venture will be included in analyses only if it has at least two consecutive observations in the database. As a result, ventures with only one year observation will be dropped, which can lead to sample selection bias by systematically dropping short-lived ventures as well as those founded close to the end of our research period. Nevertheless, in supplementary analyses, we lagged the independent variables by one year and obtained very consistent findings.

Third, previous studies have highlighted the important role of business groups in emerging markets (Hoskisson *et al.*, 2000; Keister, 1998; Khanna and Yafeh, 2007). Compared to Japan's keiretsu and Korea's chaebol, China's business groups are 'large, multi-industry entities with strong ties to the state but not to particular families' (Keister, 1998: 409).[8] To take into account this effect, we controlled for *business group affiliation*, coded as '1' if a technology venture was affiliated with a business group in a year and '0' otherwise.

Fourth, previous studies have shown that education of new venture managers has an important impact on new venture performance (e.g., Amason, Shrader, and Tompson, 2006). Typically, returnees in technology industries have advanced degrees. To rule out the alternative explanation that the educational difference was the main driver of performance differences between ventures led by returnees and ventures led by locals, we controlled for the *education level of the legal representative* of a venture. We used a five-point scale to measure their education level coding a PhD degree as '5,' master's degree as '4,' bachelor's degree as '3,' two-year college degree as '2,' and others as '1' (Finkelstein, 1992). In supplementary analyses, we created four dummy variables (using 'others' as the base comparison group) and found very consistent results.

Fifth, new venture performance may vary across industries. To account for possible industry differences in venture performance, we included a series of two-digit industry dummies in the models. Finally, since China's economy has grown dramatically in the past decades, the performance of technology ventures in China may vary over time. To capture this possible effect, we included eight *year dummies* (1996, 1997, 1998, 1999, 2000, 2001, 2002, and 2003) using 1995 as the base comparison group.

Data analyses

In our pooled time series data, one venture could contribute muliple yearly observations that were not independent from each other (Petersen and Koput, 1991). To examine venture employment size, sales, and profit, we used random effects models to address the lack of independence among the multiple obser-

vations associated with one venture for several reasons. First, a fixed effects approach requires variance in both dependent and independent variables to assure that these variables are distinguishable from the fixed effects (Judge *et al.*, 1985). In our data, some variables, including two main predictors (returnee venture and state controlling ownership) as well as some controls (business group affiliation and foreign-owned firms) did not change for most of the ventures in the sample period. Thus, we could not estimate our models using the fixed effect models. Second, when studying a relatively short period, fixed effects models typically produce biased estimates (Chintagunta, Jain, and Vilcassim, 1991; Heckman, 1981). While the sample period of this study was nine years, many ventures contributed fewer than nine observations due to late founding and/or early exit. Indeed, each venture contributed an average of 2.5 observations in our data. Thus, random effect models provided more robust estimates.

We used discrete time event history techniques to examine the likelihood of venture exit (versus survival) (Allison, 1984; Yamaguchi, 1991). As Allison (1984: 14) pointed out, 'when the time units are large—months, years, or decades—it is more appropriate to use discrete time methods.' The method also allowed us to treat ventures that existed in 2003 (the last year of our research period) as right censored, thereby providing more rigorous analyses of venture exit versus survival (Allison, 1984). Moreover, using the discrete time approach, we could include time varying variables in our analyses because we treated each year at risk as a distinct observation (Allison, 1984, Zhang, 2008b). Finally, we used a robust variance estimator for cluster data to correct for nonindependence (Zhang, 2008b). This approach essentially treats each cluster (i.e., all observations associated with one technology venture) as a super-observation that contributes to the variance estimate, thus generating robust estimates.

RESULTS

Table 1 presents descriptive statistics and correlations for the variables (with the exception of year dummies and industry dummies) used in our study. Unsurprisingly, employment size, sales, and profit are positively correlated with each other (r = 0.384, 0.323, and 0.195) and negatively related to venture exit (r = −0.108, −0.082, and −0.036)—that is, posi-

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[8] For details on the differences between China's business groups and Japan's keiretsu and Korea's chaebol, please refer to Keister (1998: 408-409).

Table 1. Means, standard deviations, and correlations of variables[a,b,c]

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. Employment size (Ln)	2.877	1.078	—									
2. Sales (Ln)	3.301	3.771	0.384	—								
3. Profit (Ln)	0.369	1.288	0.323	0.195	—							
4. Venture exit (versus survival)	0.085	0.279	-0.108	-0.082	-0.036	—						
5. Returnee venture	0.093	0.290	-0.024	-0.053	0.017	-0.009	—					
6. State controlling ownership	0.173	0.379	0.223	0.118	0.105	-0.026	-0.052	—				
7. Venture age	1.852	1.769	0.170	0.209	0.192	-0.014	-0.043	0.123	—			
8. R&D investment (Ln)	0.705	0.994	0.288	0.139	0.138	-0.084	0.019	0.100	0.171	—		
9. Foreign-owned venture	0.128	0.335	0.082	0.097	0.166	0.038	0.091	-0.061	0.053	-0.060	—	
10. Business group affiliation	0.052	0.222	0.179	0.090	0.111	-0.020	-0.021	0.264	0.061	0.069	0.013	—
11. Education level of legal representative	3.178	0.961	0.085	-0.017	0.081	-0.137	0.331	0.045	0.032	0.132	0.058	0.040

[a] N = 33,290 firm-year observations.
[b] Year dummies and industry dummies are not included in the correlation matrix.
[c] Correlations with absolute values equal to or greater than 0.013 are significant at the level of p < 0.05. Correlations with absolute values equal to or greater than 0.017 are significant at the level of p < 0.01. Correlations with absolute values equal to or greater than 0.019 are significant at the level of p < 0.001.

tively related to venture survival. The positive, yet modest, correlations among the four performance dimensions suggest they capture related yet distinct aspects of new venture performance, thus allowing us to validate our findings and extend the insights of our study.

Table 2a presents the results of models predicting ventures' employment size and sales, and Table 2b presents the results on ventures' profit and the likelihood of venture exit. (A negative coefficient would suggest a positive effect on the likelihood of venture survival). For each of the dependent variables, we estimated four models. Model 1 is the main effect model, Model 2 adds the interaction of returnee venture and state controlling ownership, Model 3 adds the interaction of returnee venture and venture age, and Model 4 is the full model. Results are stable across different model specifications.

Our results show that returnee venture has a significantly negative relationship with venture employment size (b = –0.132, p < 0.001, Model 1a) and sales (b = –0.480, p < 0.001, Model 1b) and a significantly positive relationship with the likelihood of venture exit (b = 0.415, p < 0.001, Model 1d) (i.e., a negative relationship with the likelihood of venture survival). While returnee venture is negatively related to venture profit, the coefficient is not significant (b = –0.010, n.s., Model 1c). These results show that, on average, new technology ventures with a returnee leader underperform as compared to ventures with a local leader, suggesting that the net effect of returnee leaders relative to their local counterparts on technology ventures is negative—their disadvantages outweigh their advantages.

Hypothesis 1 predicts that state controlling ownership would improve the performance of new technology ventures with a returnee leader relative to ventures with a local leader. This hypothesis suggests that the interaction of returnee venture and state controlling ownership is positively related to venture performance. In support of this hypothesis, our results show that the interaction of returnee venture and state controlling ownership was positively related to venture employment size (b = 0.139, p < 0.05, Model 2a) and profit (b = 0.315, p < 0.001, Model 2c). However, it was not significantly related to venture sales (b = 0.282, n.s., Model 2b) or the likelihood of exit (b = –0.030, n.s., Model 2d). Therefore, our findings support Hypothesis 1 with respect to venture employment size and profit, but not with respect to venture sales or the likelihood of venture exit (versus survival). To facilitate interpre-

Table 2a. Random effects models predicting venture employment size and sales[a, b, c]

	Employment size				Sales			
	Mode 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Predictors								
Returnee venture	−0.132***	−0.149***	−0.179**	−0.190***	−0.480***	−0.513***	−0.639***	−0.656***
	(0.021)	(0.022)	(0.026)	(0.026)	(0.077)	(0.080)	(0.094)	(0.096)
Moderators								
State controlling ownership	0.301***	0.291***	0.300***	0.292***	0.384***	0.365***	0.383***	0.369***
	(0.017)	(0.018)	(0.017)	(0.018)	(0.062)	(0.063)	(0.062)	(0.063)
Venture age	0.066***	0.066***	0.064***	0.064***	0.403***	0.403***	0.394***	0.395***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.013)	(0.013)	(0.013)	(0.013)
Interactions								
Returnee dummy * state controlling ownership		0.139*		0.119*		0.282		0.208
		(0.057)		(0.057)		(0.212)		(0.214)
Returnee venture * venture age			0.029***	0.027**			0.103**	0.098**
			(0.009)	(0.009)			(0.036)	(0.036)
Controls								
R&D investment	0.230***	0.230***	0.230***	0.230***	0.506***	0.506***	0.506***	0.506***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.020)	(0.020)	(0.020)	(0.020)
Foreign-owned venture	0.250***	0.252***	0.251***	0.252***	0.692***	0.695***	0.693***	0.695***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.073)	(0.073)	(0.073)	(0.073)
Business group affiliation	0.351***	0.352***	0.351***	0.351***	0.673***	0.674***	0.672***	0.673***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.094)	(0.094)	(0.094)	(0.094)
Educational level of legal representative	0.072***	0.072***	0.073***	0.073***	0.075**	0.076**	0.077**	0.077**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.025)	(0.025)	(0.025)	(0.025)
Year dummies	Included	Included	Included	Included	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included	Included	Included	Included	Included
Constant	2.770***	2.769***	2.768***	2.766***	5.908***	5.906***	5.902***	5.901***
	(0.262)	(0.262)	(0.262)	(0.262)	(1.020)	(1.020)	(1.020)	(1.020)
Wald Chi2	4657.42	4666.21	4672.59	4678.64	5086.52	5088.97	5095.41	5096.84
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of observations	33290	33290	33290	33290	33290	33290	33290	33290

[a] N = 33,290 firm-years.
[b] Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, +$p < 0.1$ (two-tailed tests).
[c] Estimated coefficients and associated standard errors (in parentheses) are reported.

Table 2b.   Random effects models predicting venture profit and survival[a,b,c,d]

	Profit				Venture exit (versus survival)			
	Mode 1c	Model 2c	Model 3c	Model 4c	Model 1d	Model 2d	Model 3d	Model 4d
Predictors								
Returnee venture	−0.010	−0.047+	−0.065+	−0.087**	0.415***	0.418***	0.572***	0.570***
	(0.025)	(0.027)	(0.034)	(0.034)	(0.078)	(0.082)	(0.101)	(0.103)
Moderators								
State controlling ownership	0.220***	0.200***	0.220***	0.201***	−0.111*	−0.109+	−0.110*	−0.113+
	(0.020)	(0.021)	(0.020)	(0.021)	(0.056)	(0.058)	(0.056)	(0.058)
Venture age	0.109***	0.108***	0.106***	0.106***	0.010	0.010	0.018	0.018
	(0.004)	(0.004)	(0.004)	(0.004)	(0.012)	(0.012)	(0.012)	(0.012)
Interactions								
Returnee venture * state controlling ownership		0.315***		0.295***		−0.030		0.038
		(0.074)		(0.075)		(0.237)		(0.235)
Returnee venture * venture age			0.035*	0.027*			−0.103*	−0.103*
			(0.014)	(0.014)			(0.043)	(0.043)
Controls								
R&D investment	0.128***	0.128***	0.128***	0.128***	−0.290***	−0.290***	−0.290***	−0.290***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.025)	(0.025)	(0.025)	(0.025)
Foreign-owned venture	0.636***	0.639***	0.636***	0.639***	0.317***	0.316***	0.318***	0.319***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.051)	(0.051)	(0.051)	(0.051)
Business group affiliation	0.383***	0.384***	0.383***	0.384***	−0.146	−0.146	−0.147	−0.147
	(0.032)	(0.032)	(0.032)	(0.032)	(0.108)	(0.108)	(0.108)	(0.108)
Educational level of legal representative	0.044***	0.044***	0.044***	0.044***	−0.493***	−0.493***	−0.494***	−0.494***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.022)	(0.022)	(0.022)	(0.022)
Year dummies	Included	Included	Included	Included	—[d]	—	—	—
Industry dummies	Included	Included	Included	Included	—[d]	—	—	—
Constant	−0.346	−0.344	−0.345	−0.343	−0.813***	−0.813***	−0.823***	−0.823***
	(0.389)	(0.389)	(0.389)	(0.389)	(0.060)	(0.060)	(0.060)	(0.060)
Pseudo R²	—	—	—	—	0.0446	0.0446	0.0448	0.0448
Wald Chi2	3565.56	3586.83	3572.69	3590.94	845.03	845.04	846.49	846.69
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood	—	—	—	—	−9259.47	−9259.46	−9256.92	−9256.91
Number of observations	33290	33290	33290	33290	33290	33290	33290	33290

[a]N = 33,290 firm-years.
[b]Significance levels: ***p < 0.001, **p < 0.01, *p < 0.05, +p < 0.1 (two-tailed tests).
[c]Estimated coefficients and associated standard errors (in parentheses) are reported.
[d]When industry dummies and/or year dummies were included in the survival models, some observations dropped out because of perfect prediction, thus the sample size would be reduced. Models that included industry/year dummies and those that excluded those dummies produced very consistent results. In order to have the same sample size across models with different dependent variables, we reported the results of models excluding industry/year dummies.
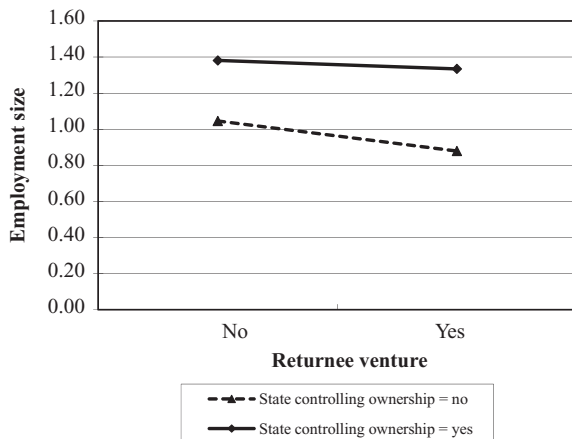
Figure 1.   Returnee venture and employment size: the moderating role of state controlling ownership

Figure 2.   Returnee venture and employment size: the moderating role of venture age

tation, we plotted the significant interaction effect on venture employment size in Figure 1, following the procedure recommended by Aiken and West (1991). To create this figure, all variables in Model 2a except returnee venture and state controlling ownership were constrained to sample mean. Returnee venture and state controlling ownership took values of '0' and '1.' As shown in Figure 1, new technology ventures with returnee leaders underperformed as compared to ventures with local leaders when the ventures did not have state controlling ownership; however, the performance gap almost disappeared when returnee leaders' ventures have state controlling ownership.[9] This plot is consistent with the prediction of Hypothesis 1.

Hypothesis 2 predicted that older venture age would improve the performance of new technology ventures with a returnee leader relative to ventures with local leaders. This hypothesis suggests that the interaction of returnee venture and venture age is positively related to venture performance. In support of this hypothesis, we found that the interaction of returnee venture and venture age was positively related to venture employment size ($b = 0.029$, $p < 0.001$, Model 3a), sales ($b = 0.103$, $p < 0.01$, Model 3b), and profit ($b = 0.035$, $p < 0.05$, Model 3c) and negatively related to the likelihood of venture exit (i.e., positively related to the likelihood of venture survival) ($b = -0.103$, $p < 0.05$, Model 3d). Therefore, we found support for Hypothesis 2 with respect to the four performance consequences.

Following a similar procedure, we plotted the significant interaction effect of returnee venture and venture age on employment size in Figure 2. In this figure, venture age took values of '0.' (Venture age was coded as '0' for the first year when it was founded. The value of '0' is the minimum value of venture age and is about one standard deviation below mean) and '4' (about one standard deviation above mean). As shown in Figure 2, ventures with returnee leaders underperformed as compared to ventures with local leaders when the ventures were younger (venture age = 0); but the performance gap narrowed if the ventures aged.[10] This plot is consistent with the prediction of Hypothesis 2.

The moderating variables and control variables also demonstrate some interesting findings. First, state controlling ownership was positively related to all four dimensions of venture performance (employment size, sales, profit, and likelihood of survival), supporting our argument that state controlling ownership in China's emerging market can bring institutional and resource advantages to new technology ventures. Venture age was positively related to venture employment size, sales, and profit; however, venture age was not significantly related to the likelihood of venture exit (versus survival). Further analysis (results not reported here and available upon request) suggested that the squared term of venture age was negatively and significantly related to the likelihood of venture exit. These results suggest that the likelihood of exit first increases as a venture ages and then declines as the venture ages

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[9] We also plotted the significant interaction effect on venture profit, which is consistent with the plot in Figure 1.

[10] We also plotted the interaction effects with respect to other dependent variables. Those plots are consistent with the one shown in Figure 2.

Table 3.   Education levels of returnee legal representatives and local legal representatives[a,b,c]

	Firm-years with returnee legal representatives		Firm-years with local legal representatives		Returnees versus locals	
	Number	Percentage	Number	Percentage	Difference	Z-value/ T-value
Total	3,082	100%	30,208	100%	—	—
PhD degree	1,234	40.0%	1,807	6.0%	34.0%	62.5***
Master's degree	1,225	39.8%	6,627	22.0%	17.8%	22.2***
Bachelor's degree	562	18.2%	15,733	52.0%	−33.8%	−35.8***
Two-year college Degree[b]	43	1.4%	4,162	13.8%	−12.4%	−19.7***
Others	18	0.6%	1,879	6.2%	−5.6%	−12.9***
Average education level[c]	4.2		3.1		1.09	70.4*** (T value)

[a]Unit of analysis is firm-year.
[b]'Dazhuan' degree in Chinese.
[c]With a five-point scale in which PhD degree was coded as '5,' master's degree as '4,' bachelor's degree as '3,' two-year college degree as '2,' and others as '1.'

further. This inverse U-shaped pattern of age-dependent exit rate of new technology ventures is consistent with Brüderl and Schussler's (1990) argument of liability of adolescence in explaining organizational mortality.

We found a positive relationship between amount of R&D investment and all four dimensions of venture performance, supporting the importance of R&D investment in technology ventures (Eisenhardt and Schoonhoven, 1990). We found positive relationships for foreign-owned venture and venture employment size, sales, and profit; but foreign-owned venture was also positively related to the likelihood of venture exit (i.e., negatively related to the likelihood of survival). These results suggest that, in general, foreign-owned firms were more successful (in terms of employment size, sales, and profit) than domestic ones. However, these two venture groups may operate using different levels of performance thresholds for exit: for example, foreign-owned firms may exit at higher performance thresholds than domestic firms, due to higher costs.

We found positive relationships between business group affiliation and venture employment size, sales, and profit, supporting the important role of business groups in China (Keister, 1998). Moreover, education level of a venture's legal representative was positively related to all four dimensions of venture performance, highlighting the importance of top manager education in technology ventures.

Post hoc analyses

Earlier we argued that, relative to their local counterparts, returnee leaders have advantages in terms of higher education levels and associated human capital. We conducted supplementary analyses to verify this argument.[11] Table 3 reports the distribution of education levels (both by categorical measures and continuous measure) of returnee legal representatives and local legal representatives in our sample. On average, returnee legal representatives have higher education levels than local legal representatives: 40 percent of them (versus 6 percent of locals) held a PhD and 39.8 percent of returnees (versus 22 percent of locals) held a master's degree.[12] Note that the education levels of ventures' legal representatives are positively related to all four measures of venture performance, as shown in Tables 2a and 2b. Thus, returnees as legal representatives may have an *indirect* positive effect on their

ventures' performance—that is, relative to local legal representatives, returnee legal representatives, on average, have higher education levels, an asset that positively impacts new venture performance.

DISCUSSION AND CONCLUSIONS

Discussion of findings

With data on new ventures in China's largest technology cluster in the period from 1995 to 2003, we found that returnee leaders were particularly likely to help state-owned ventures and particularly likely to hurt very new ventures. Overall, technology ventures with a returnee leader tended to underperform as compared to ventures with a local leader. We validated these findings by using different measures of venture performance, including employment size, sales, and likelihood of survival.

Our results regarding the contingent effect of state controlling ownership is consistent with the findings of earlier studies. For example, Harvey (2009) showed that highly skilled migrants from China ranked (home country) 'government treatment of returnees' as an important factor in their decision to return. Vanhonacker *et al*. (2006) found that 57 percent of their sampled (Chinese) returnees indicated that establishing a cooperative relationship with the government was the best strategy for doing business in China. While these studies showed that migrants from China took into account connections with the government in their decisions on returning, our study provides empirical support for the consequences of having such connections. Our findings suggest that state controlling ownership serves as an important mechanism that can help returnee leaders mitigate their disadvantages in their home country.

Our findings also suggest that returnee leaders likely hurt very new ventures but less so old ventures. It appears that when returnees return to their often transitioning and quickly changing home countries, their unfamiliarity and lack of roots in their home countries cause them to suffer from a liability of 'foreignness.' Returnees' liability of foreignness in their home countries parallels foreign firms' 'liability of foreignness' in host countries caused by firms' unfamiliarity with the host countries' environments (Zaheer, 1995). Foreign firms can overcome their liability of foreignness over time by learning about the host country's environments and gradually

fitting into them (Zaheer and Mosakowski, 1997). Similarly, returnees can overcome their liabilities of foreignness over time as their ventures age by getting (re)connected with critical local constituents and developing a better understanding of the social, cultural, and institutional changes of their home country. However, returnee leaders likely hurt very new ventures because of the combination of their liability of foreignness and their ventures' liability of newness. That is, very new ventures with a returnee leader suffer from a dual liability.

Because our findings are based upon new ventures in a single technology cluster from a single country (albeit the largest technology cluster in the largest emerging market), it is important to discuss the boundary conditions of our findings. Because migrants with advanced skills tend to *self-select* into founding/joining technology ventures in their home countries (Qin, 2007; Vanhonacker *et al*., 2006), we believe returnees' advantages (relative to locals) in education, technological skills, and managerial skills are likely common across other emerging markets. Similarly, their relative disadvantages in terms of lack of local connections and local knowledge are also likely universal because by living overseas, they had fewer opportunities to build connections in their home countries and develop mature understandings of the society and business practices in their home countries. However, the relative magnitude of returnees' advantages and disadvantages likely varies across different emerging markets. China's cultural and institutional environment favoring *guanxi* likely explains the dominance of returnees' disadvantages over their advantages (Li and Atuahene-Gima, 2001; Xin and Pearce, 1996).

The contingent effect of state controlling ownership should also vary across emerging markets. State involvement via state controlling ownership is important in countries such as China, where the government remains an important influence in strategic resource allocations. However, the contingent effect of venture age is likely common across emerging markets; in any country, it takes time for returnees to build local connections and gain local knowledge. Even so, because technology ventures in different emerging markets may face some unique challenges due to the cultural, political, and economic differences (Li and Atuahene-Gima, 2001), we caution that replications of our model with firms in other emerging markets are needed for more confident generalization.

Contributions

As individual country markets become more globally integrated, the demand for and the value of transnational human capital increase. Saxenian (2006) described the phenomenon of immigrant talents being the 'new Argonauts' who have leveraged their knowledge, skills, and social networks developed in the U.S. to enable economic growth in their home countries (most are emerging markets). More recently, *The Economist* (2011: 72) noted that 'mass migration in the internet age is changing the way that people do business' and 'no other social networks offer the same global reach—or commercial opportunity.' Our study contributes to the emerging literature on the role of returnees in technology entrepreneurship. Different from previous studies that have focused on returnees' strategic value in firm export and innovation, we provide a comprehensive evaluation of returnees' effectiveness in technology entrepreneurship by examining their impact on a range of venture performance dimensions (i.e., employment size, profit, sales, and survival). Our findings suggest that returnees have two faces in emerging markets. On the one hand, many returnees have accumulated advanced technological and managerial skills through higher education and working in the West. They return looking for opportunities to exploit their skills in their home countries. On the other hand, after years of living abroad, returnees have disadvantages in terms of a lack of local connections and understanding of general societal issues—both of which are critical for leading a successful venture. The overall negative impact of returnee leaders on venture performance suggests that, in the Chinese context, returnees' disadvantages overweigh their advantages.

Our study also contributes to this line of research by theoretically articulating and empirically demonstrating how contextual factors may shape the relative effectiveness of returnees and their local counterparts in technology entrepreneurship. Our findings suggest state controlling ownership and older venture age help reduce the performance gap between technology ventures with a returnee leader and ventures with a local leader. These findings are consistent with our arguments that these contextual factors can help returnees overcome their disadvantages in terms of lack of local connections and local knowledge, and thus improve their ventures' performance relative to ventures with local leaders.

Our findings also help reconcile the different views on returnees in previous studies. Some scholars suggest that returnees who have developed and accumulated advanced technological and managerial skills in the West are in a better position in technology entrepreneurship than their local counterparts in their home countries (e.g., Saxenian, 2006). Others, however, note that local leaders often have a better understanding of local markets and know how to tap them, compared with returnees who have been abroad for years (Buckman, 2005). Our findings bridge these two contradictory views and suggest that returnees have both—advantages and disadvantages—and their net effect depends upon the extent to which they can overcome their disadvantages in their home country.

In addition, our findings shed important insights into the more general question of what makes technology ventures successful in China. Our results demonstrate that technology ventures with a local leader are more successful than ventures with a returnee leader; technology ventures with state controlling ownership are more successful than those without; and technology ventures affiliated with a business group are more successful than those without. That local leaders and state controlling ownership are advantageous may be somewhat surprising considering the widely presumed advantages of returnees in bridging business opportunities (e.g., *The Economist*, 2011) and the reputation state-owned firms have for inefficiency and a lack of accountability. Our results suggest that, in China, nonmarket forces still play an important role in business success, even in the technology industries where technological competence should drive business success and where ties to the state should be less important relative to other industries.

Our findings provide important guidelines and practical implications for policy makers and practitioners. Policy makers in emerging markets have provided various economic and political incentives to attract returnees and reverse the 'brain drain.' A number of migrants in the developed countries have already gone back to their home countries to explore entrepreneurial opportunities. Our findings, however, show that, on average, new technology ventures in China with a returnee leader actually underperform compared with those with a local leader. These findings highlight the prevalence of returnees' disadvantages in terms of lack of local connections and an insufficient or outdated understanding of important societal and business practices. However, our find-

ings do endorse some emerging market governments' (e.g., China) preferential policies aimed at attracting returnees with advanced education degrees. As our findings show, returnees in general have more advanced education than their local counterparts and their education has a strong positive impact on various dimensions of venture performance. Our findings also shed useful insights on when returnees particularly help and when they particularly hurt. Returnees hurt the most when ventures are very young; returnees help state-owned ventures more than the non-state-owned ventures.

In conclusion, with a longitudinal data set of new ventures in China's largest technology cluster from 1995 to 2003, we examined how contextual factors shape the performance of new ventures with a returnee leader relative to those with a local leader. We believe that our findings provide a comprehensive evaluation of returnees' effectiveness in technology entrepreneurship, particularly in the context of China's emerging market.

ACKNOWLEDGEMENTS

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