

## **Success in Global Venture Capital Investing: Do Institutional and Cultural Differences Matter?**

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**Abstract:** We analyze the impact of institutional and cultural differences on the likelihood of success in global venture capital (VC) investing. In both developed and emerging economies, we find better legal rights and their enforcement significantly affect the likelihood of VC success. As well, better developed stock markets have a positive influence on VC performance, which highlights the importance of capital markets for development of VC industry. Strikingly, we find that cultural distance between the countries of the portfolio company and its lead VC investor is *positively* related to VC success. Further analyses reveal that cultural differences create incentives for better ex-ante screening and due diligence, so transactions involving high cultural disparity materialize only when they have substantial economic potential. Finally, consistent with the “home bias” literature, the presence of local VC investors positively influences VC success and mitigates foreign VC firms’ “liability of foreignness” arising from institutional and cultural differences, but only in developed economies. Local VC participation does not affect performance in emerging economies, which highlights the lack of expertise/experience of local investors in those countries. Our conclusions follow from the analyses of VC investments in more than 9,000 companies across 32 countries that include both developed and emerging economies.

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## Introduction

In recent years, global venture capital (VC) investing has increased manifold in terms of capital involved, number of deals, and geographical diversity. Initially largely confined to North America and a few Western European countries, VC investing is now a phenomenon throughout the world. Global non-U.S. VC investing reached nearly \$25 billion in 2007 (Source: SDC Platinum Venture Economics) and many U.S. based VC firms actively invest abroad. Most research to date has analyzed VC investments in North America, which primarily include funding of U.S. based companies.<sup>1</sup> In this study we analyze the determinants of VC success in global investing, focusing especially on country-specific institutional and cultural factors.

Successful global investing can have several benefits for VC firms in terms of improved access to deal flow, increased diversification, and potentially higher growth. However, the observed success of VC investments varies substantially across countries, which suggests there are important country-specific factors that facilitate successful VC exits.

For instance, several accounts by academics and practitioners highlight the importance of legal and institutional framework, culture, and local partners in international investment decisions. While several studies (for example, La Porta, Lopez de Silanes, Shleifer and Vishny, 1997, 1998) emphasize the positive effect of the legal environment on financial decision making and valuations, some recent works (Allen et al., 2005, 2007) suggest that at least in some emerging markets, business can prosper within an underdeveloped legal system. This highlights the possibility that legal rights and protection that are considered important in well-developed economies may not have similar significance in all countries. In a similar vein, while a well-developed stock market in the U.S. is often regarded as an important catalyst for the development of VC industry (Black and Gilson, 1998), it remains an empirical question whether stock market development matters for VC success.<sup>2</sup> The analysis of global VC investments allows us to formally determine the impact of two very important dimensions of a country's institutional framework—law and capital markets—on VC success.

While international investing has advantages, it can also increase risk manifold when VC firms invest in foreign countries. Investments in small private companies with intangible assets

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<sup>1</sup> Recent studies that analyze the success of VC investments in the U.S. include Gompers and Lerner (2000a), Hochberg, Ljungqvist, and Lu (2007), Sorensen (2007, 2008), Nahata (2008), Gompers, Kovner, Lerner, and Scharfstein (2008a, 2008b) and Zarutskie (2007). For evidence on VC success in Canada and comparison with VC activity in U.S., see Brander, Amit, and Antweiler (2002) and Cumming and MacIntosh (2003a, 2003b).

<sup>2</sup> As Gompers and Lerner (2001) point out, the ability to consistently achieve profitable exits lies at the heart of success in venture capital industry, since VCs' returns are derived primarily from the capital gains upon these exits. In fact, a VC's decision to invest depends in large part on the portfolio company's exit potential.

and unproven technologies are undoubtedly risky propositions, and even more so in less developed and emerging economies. Furthermore, the unfamiliar environment and lack of awareness of local cultural and social practices, amplify the already substantial agency problems VCs face due to large information asymmetries with insider managers and entrepreneurs. On one hand, cultural differences can seriously impede VC success. Yet, on the other, we observe several transactions that involve investor and investee firms from different countries (Bottazzi, Da Rin, and Hellmann, 2008b). How then do cultural differences affect VC performance? And, in view of cultural and institutional differences, how important is the role of local partners? Have local non U.S. VC firms been effective in contributing to portfolio company success given the acute information asymmetry between company insiders and non-local investors? A positive effect would indicate that local partners can serve to alleviate agency problems and align interests of insiders and outside investors, thereby boosting investment performance.

Thus our key objective in analyzing VC investments in an international context is to ascertain the impact of legal rights and protection, stock market development, cultural differences, and local investor participation on VC success. While prior work examines the effects of institutional and cultural differences on VC investment decisions, their impact on VC success has not been analyzed. Second, by focusing on an international setting, we are able to discern the value added by local VC investors and their contribution to VC success. In so doing, we not only add to the large body of work on “liability of foreignness”, but also contribute to the literature on “home bias”. To facilitate our analysis of VC success, we assemble the largest-to-date dataset comprising VC financing of more than 9,000 companies across 32 countries that include both developed and emerging economies.

Our results indicate both institutional and cultural factors are important in determining VC success internationally. First, we construct country-specific legal indices that capture shareholder rights, enforcement rights, rule of law, corruption, and accounting disclosure standards, and relate them to the likelihood of VC success.<sup>3</sup> In line with the evidence in La Porta et al. (2007, 2008), our results suggest that law matters for success of private investments as well. In particular, better country-specific legal rights and protections positively influence VC success, and do so in both developed and emerging economies.

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<sup>3</sup> The shareholder rights themselves reflect the presence (or absence) of six features: one share–one vote, proxy by mail, cumulative voting, oppressed minorities mechanism, preemptive rights, and unblocked shares prior to meetings. Similarly, enforcement rights are an amalgam of five law variables: efficiency of judicial system, rule of law, corruption, risk of expropriation and repudiation of contracts. We discuss the construction of legal index in greater detail in the next section.

Second, we find that a well developed, IPO-conducive stock market, is an important catalyst in VC success in both developed and emerging economies. This is consistent with Black and Gilson's (1998) conjecture on the significance of a better developed stock market for sustenance and growth of VC industry. Well functioning capital markets are not only beneficial for conducting IPOs, but they also provide much needed stock currency for potential bidders engaging in acquisitions. It is well known that successful VC exits largely involve initial public offerings (IPOs) and acquisitions of privately held VC-backed companies.

However, globally, we observe that the proportion of successful VC exits through IPOs or acquisitions is substantially lower than that observed in the U.S. This suggests that better developed stock markets (as in U.S.) encourage VC investing, as higher average returns, particularly from IPOs, provide VCs additional incentives to invest in and provide their expertise and skills to their portfolio companies (see also footnote 2). Furthermore, founder entrepreneurs may also have a higher likelihood of retaining control over their companies if IPOs were to occur more frequently, which in turn provide the entrepreneurs additional incentives to work harder for their companies' success (Black and Gilson, 1998).

Third, we explore the significance of culture on VC success. Although intuitively appealing, the role played by culture in economic outcomes is a relatively new area of research (Guiso, Sapienza, and Zingales, 2006). Cultural differences between their countries are likely to influence transactions between VC investors and portfolio companies. Furthermore, these differences can affect the level of trust, nature of financial contracting, and portfolio company performance. Anecdotal evidence suggests that both VCs and entrepreneurs emphasize the importance of good working relationships, in an atmosphere of trust, for a better chance of success. Unfamiliarity with the local business practices and/or lack of trust, driven in part by cultural differences, may adversely impact these relations and hence impede VC success.

Some recent studies that relate cultural differences and economic decision making include Guiso, Sapienza and Zingales (2007, 2008) who examine the role of trust in investment decisions. In the VC context, Bottazzi, Da Rin, and Hellmann (2008b) analyze the impact of trust on VCs' international investment choices. Progressing naturally, we investigate the impact of cultural differences on international VC success. We measure cultural differences between the countries of VC investors and their portfolio companies using the Hofstede distance.<sup>4</sup> Strikingly, we actually find that a higher cultural distance between the lead VC investor and the portfolio

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<sup>4</sup> We discuss the Hofstede measures of country specific culture in section 2.3. The Hofstede framework is by far the most used and cited cultural framework in international business, management and applied psychology and has been used in several other business disciplines including academic finance.

company *increases* the likelihood of VC success. This result persists when we relate the four individual components of Hofstede distance to international VC success.<sup>5</sup>

One possible explanation is VCs, expecting cultural differences, do a better job in screening and due diligence before investing in their portfolio companies. Anticipating cultural differences, if VCs set a higher bar for their investments in culturally distant nations, and yet make those transactions, the investments are likely to be of better than average quality. We test this interpretation in two ways.

First, we exploit the observed tendency of experienced VCs being more likely to be involved in culturally distant transactions, to construct a measure of VC due-diligence and then incorporate it directly in our multivariate analysis of VC success. A significantly positive coefficient on the due-diligence measure would suggest that better screening and evaluation of companies does result in a higher success rate for VC firms. We indeed find this to be the case.

Second, we interact cultural distance with an emerging economy indicator to test whether cultural distance has an incremental impact on VC success in emerging economies. We obtain a significantly positive coefficient on the interaction term, which suggests that VCs rationally anticipate significant challenges, originating in part from cultural differences, when investing in emerging economies, and hence spend considerable upfront effort in proper screening and due diligence of those investments. This results in a higher likelihood of VC success. A related test also shows that the coefficient on cultural distance is significantly larger in predicting VC success in emerging economies relative to the developed economies.

Finally, we analyze the impact of local investor participation on VC success. There exists a large body of research in international business and management, which illustrates that while indigenous firms gain tangible advantages due to their easier access to local information, networks, resources, and knowledge, foreign firms incur higher information and transaction costs arising from their lack of familiarity with the host environment and local cultures. As a result foreign investors suffer from what Kindleberger (1969), Hymer (1960, 1976), and Zaheer (1995) term ‘liability of foreignness’ or LOF. The extensive literature on ‘home bias’ draws similar conclusions in terms of performance of investments made in more familiar local environments relative to alien turfs (for example, see Coval and Moskowitz, 2001).

While testing for implications of local VC involvement, we need to control for VC syndication effects, since it has been found to be an important predictor of VC success.<sup>6</sup> We do

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<sup>5</sup> This result is similar in spirit to the evidence in Chakrabarti, Jayaraman, and Mukherjee (2008) who find that a higher cultural disparity between the two countries involved in cross-border acquisitions is positively associated with the long run performance of these acquisitions.

so in two ways. First, we measure the size of VC syndicate in each portfolio company. Second, we control for whether the VC syndicates contain a U.S. headquartered VC firm. U.S. based VC firms dominate the organized VC industry, and possess extensive VC investment experience by virtue of their long history of venture capital activity. Moreover, U.S. style venture capital contracts have been found to be more efficient in terms of performance which is also reflected in their increased worldwide adoption through the years (Kaplan, Martel, and Stromberg, 2007). Our results indicate VC syndicate size is associated with a higher likelihood of VC success in both developed and emerging economies. VC syndicates containing U.S. headquartered VCs experience a higher level of success as well although only in developed countries.

More importantly, when we control for local investor participation, we find that VC syndicates that include *both* U.S. based and local VCs have a much higher likelihood of success. On the other hand, the indicator denoting presence of a U.S. headquartered VC firm loses its power to predict VC success. This suggests that U.S. headquartered VC firms and local VC investors in venture capital syndicates act as complements, as VC syndicates that include both investor types perform significantly better. While the presence of a U.S. based VC firm brings the benefit of experience and contract design expertise, local VC investor participation helps in mitigating the LOF problem.

However, local investor participation does not affect VC success in emerging countries. This is consistent with the notion that local VC investors from emerging economies are relatively inexperienced, and hence do not have the expertise to exploit their local informational advantage and contribute significantly to the likelihood of portfolio company success.

The major contributions of this research are as follows. Motivated by the observation that VC success varies substantially across countries, we analyze the influence of country-specific institutional and cultural factors on VC success. We believe this study is the first of its kind examining VC investments across several countries and analyzing the determinants of their success. Second, we show that a country's institutional framework—legal system and capital markets—is important in contributing to success of privately-held VC investments. This indicates that the presence of better developed legal institutions and capital markets represent a source of comparative advantage for countries trying to promote entrepreneurship and the venture capital industry. Third, we highlight the influence of cultural differences and local investor participation on VC success. In so doing, we emphasize the importance of both VC screening (due-diligence)

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<sup>6</sup> Lerner (1994a), Brander, Amit, and Antweiler (2002), and Nahata (2008) provide evidence on the beneficial impact of VC syndication.

and monitoring for VC success. Finally, since our dataset is larger and more diverse than those in earlier studies, we separately analyze the sub-samples of developed and emerging economies and provide evidence regarding the determinants of VC success in both types of markets.

The rest of the paper is organized as follows. Section 2 discusses the related literature and outlines the testable hypotheses. Section 3 describes the data and provides summary statistics. Section 4 investigates the performance of international venture investments in a multivariate framework. Section 5 concludes.

## **2. Literature review, hypotheses, and analytical framework**

We review the extant literature pertaining to international venture capital in this section and outline the testable hypotheses. We discuss each important strand that can potentially affect the likelihood of VC success in a global context, particularly focusing on the institutional and cultural differences across countries.

### *2.1. Legal rights and protection*

Among institutional features country-specific legal systems, especially, have a widespread impact on business and economics. For attracting investments, strengthening investor confidence through appropriate laws and regulations is considered particularly important. Regulations on shareholder rights including those that protect minority shareholders and reliable enforcement of shareholder and creditor rights in the event of disputes are critical for creating an attractive investment climate. Furthermore, promoting sound corporate governance standards is equally imperative. Countries that promote and enforce rules related to standardized public disclosure, management accountability, and internationally accepted accounting practices are likely to be favored by investors. Worldwide, over the previous two decades, several countries have instituted reforms that address these important issues aimed at strengthening their local financial markets for attracting foreign investment.

La Porta, Lopez de Silanes, Shleifer and Vishny (1997, 1998)—LLSV hereafter—and several other studies have shown that law matters for financial decision making and valuations. In the VC context, a number of recent studies examine how legal systems influence venture capital contracts; see in particular, Bottazzi, Da Rin and Hellmann (2008a), Cumming, Schmidt and Walz (2008), Kaplan, Martel and Strömberg (2007), and Lerner and Schoar (2005). To examine the impact of legal rights and protection on the likelihood of successful VC exits, Cumming, Fleming, and Schwienbacher (2005) use a sample of countries in the Asia-Pacific

region, and provide evidence that better legal rights positively affect the likelihood of VC success. Similarly emphasizing the positive impact of law, Cumming and Walz (2009) show that less stringent accounting standards and weak legal systems appear to facilitate aggressive performance reporting behavior by VC funds when they disclose valuations of their yet unharvested investments. Our analysis of the impact of legal rights and protections on VC success differs from previous research in primarily two ways.

First, we separately analyze the impact of legal rights and protections on the likelihood of VC success in emerging countries, since it is not entirely clear which (or even whether) legal rights and protections matter in emerging economies. For example, Allen et al. (2005) study China's recent economic growth, and conclude that even though its legal and financial systems are much underdeveloped, yet it has one of the fastest growing economies. In another study on India, another fast growing economy, Allen et al. (2007) provide evidence that many Indian firms conduct business outside the formal legal system and do not rely on formal financing channels from markets and banks for most of their financing needs. On the other hand, Lerner and Schoar (2005) provide evidence that private equity transactions (involving buyouts, corporate acquisitions, distressed firms, company expansion, IPOs, privatizations, and venture capital) in developing countries with better law enforcement have higher post-money valuations. The overall evidence suggests a more complicated system seems to operate in emerging economies rather than the more conventional law-finance-growth nexus.

Second, since our dataset is larger and more diverse than those in other studies that analyze the impact of law on VC success, we believe our analyses confer better power on the statistical tests, relative to more homogeneous samples.<sup>7</sup>

Given prior evidence of a mostly positive impact of law on valuations of companies, and also its importance for economic growth and development of financial markets, our null hypothesis captures the idea that countries with better legal regimes and protection are likely to witness a higher proportion of successful VC exits. Our first hypothesis is:

*H<sub>1</sub>: Better country-specific legal rights and protection positively influence the likelihood of international VC success.*

To capture law, we aggregate the country-specific legal rights and protection into a legal index by adding the shareholder rights, enforcement rights, and accounting standards in each

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<sup>7</sup> Other cross-country studies on international venture capital, but not restricted to law and finance analysis of venture capital, include Cumming and Macintosh (2003a, 2003b), Hege, Palomino, and Schwiendbacher (2008), and Schwiendbacher (2005). These studies analyze the developed venture capital markets in U.S. and Europe and their foci of analyses are different from ours.



country. The shareholder rights are aggregated on six indicator variables: one share—one vote, proxy by mail, cumulative voting, oppressed minorities mechanism, preemptive rights, and unblocked shares prior to meetings (source: LLSV), and then divided by their maximum possible value of 6. In a similar vein, the enforcement rights are an amalgam of five law variables: efficiency of judicial system, rule of law, corruption, risk of expropriation and repudiation of contracts, each assigned ten points (source: LLSV and Transparency International). The cumulative enforcement rights thus created are divided by their maximum value of 50. The accounting standards are measured on a scale of 0-100 (Source: LLSV), and we normalize them by their maximum possible value of 100. Finally, we create the country-specific legal index by adding the normalized values of shareholder rights, enforcement rights, and accounting standards for each country.<sup>8</sup>

## *2.2. Stock market development*

A vital institutional factor conducive to attracting investment and promoting growth is a well-developed capital market. Financial market development can facilitate economic growth by reducing the costs of external finance to firms (Rajan and Zingales, 1998). A useful indicator of financial development is the ease with which a company or an entrepreneur can obtain financing for their projects based on the quality of the underlying assets or ideas (Rajan and Zingales, 2003). By reducing information and transactions costs and allowing more entrepreneurs to obtain external finance, well-developed capital markets improve the allocation of capital. In general, better functioning financial systems can make financial services available to a larger proportion of the population, rather than restricting capital to entrenched incumbents (Morck, Wolfenzon, and Yeung, 2005).

While Western countries typically have well developed institutions (for example, capital markets) relative to other economies, several countries, particularly emerging economies, have instituted wide ranging reforms to improve the functioning of their institutions. A few of these reforms consisting of legal and regulatory changes are aimed at strengthening the local capital markets to promote foreign investment, availability of capital, and entrepreneurship.

A key feature of the venture capital industry is harvesting of VC investments. Harvesting provides the venture capitalists the only way to earn consistently profitable returns by converting their illiquid investments into cash. A good performance in harvesting investments considerably

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<sup>8</sup> For example, United Kingdom scores normalized values of 0.67 on shareholder rights, 0.93 on enforcement rights, and 0.78 on accounting standards. Thus, its legal index obtains a value of 2.38.

facilitates future fundraising, and even when evaluating potential investments, VCs have an eye on the prospective exit avenues available to them. The two profitable exit avenues – IPOs and acquisitions – require well functioning stock markets as a vital catalyst for their occurrence. For instance, stock markets provide potential acquirers much needed acquisition currency, whereby the bidders can use their stock (or a mix of cash and stock) in acquisition transactions. An active and vibrant stock market also creates incentives for increased VC investment activity, leading in turn to an active venture capital industry (Black and Gilson, 1998). Because of the importance of stock markets for (rapid) VC exits from their portfolio companies, we hypothesize that countries with well-developed stock markets are likely to witness a higher likelihood of successful VC exits. Our second hypothesis tests this intuition.

*H<sub>2</sub>: Better developed stock markets are more conducive for successful VC exits.*

### *2.3. Cultural differences*

An important topic in international business studies is the difference in national cultures across countries, and the resultant impact on different facets of business enterprise. While the importance of cultural issues has received prominent emphasis in other disciplines such as strategic management and international business, their impact on corporate financial decisions is only now being explored. In a recent article, Chakravarti et al. (2008) examine the impact of cultural differences on cross-border acquisitions, and provide evidence that higher cultural differences actually lead to higher announcement returns for acquirers. Relating trust and economic decision making, Guiso, Sapienza and Zingales (2008) examine the role of trust, originating at least in part from the cultural differences between countries, as a determinant of trade and investment flows between the countries. While Guiso et al. (2008) employ macro-level data two recent studies employ micro-data to examine the role of trust on investment decisions. Guiso, Sapienza and Zingales (2007) show that trust affects stock market investment decisions in general, while Bottazzi, Da Rin, and Hellmann (2008b) document that trust plays a central role in VC investment decisions as well.

However, the impact of cultural differences on the eventual outcome of international VC investments has not been analyzed. In the VC context, anecdotal evidence suggests that both VCs and entrepreneurs emphasize the importance of mutual trust, for a higher likelihood of their companies' success. In fact, not being able to build effective working relationships is often regarded as one of the primary causes of failed ventures, even in a relatively homogeneous investing environment as the U.S. Arguably, in international VC investments, differences arising

from cultural diversity can be a major source of conflict between company insiders and external investors, with potential to adversely affect VC performance.

On the other hand, awareness of cultural differences and related challenges can lead to better ex-ante screening and due diligence, whereby transactions involving high cultural disparity materialize only when they have substantial economic potential.<sup>9</sup> We hasten to add that all VC transactions are subject to an extensive due-diligence process. However, a higher cultural disparity between the parties is likely to make investors extra-cautious and create incentives for better screening of their portfolio companies, especially involving international transactions. Rosenbloom (2002), for instance, emphasizes the importance of due diligence in all transactions and particularly those involving parties across national borders. Thus, which of the two effects—positive or negative—dominates empirically is an interesting unanswered question that we explore by analyzing the role of cultural differences in VC investment outcomes. We examine the following null and alternative hypotheses:

*H<sub>3N</sub>: A higher cultural disparity between the VCs and their portfolio companies adversely affects the performance of international VC investments.*

*H<sub>3A</sub>: A higher cultural disparity between the VCs and their portfolio companies leads to better ex-ante screening and due diligence by VCs thereby positively affecting the performance of international VC investments.*

To test our third hypothesis, we use the Hofstede's measures of country culture to compute cultural differences between countries. Geert Hofstede, in his landmark book on international management, *Culture's Consequences: International Differences in Work Related Values*, explains how cultures evolve by imbibing factors that include climate, economic development and history.

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. For example, in societies displaying small power distances, people relate to each other more as equals regardless of formal positions. In contrast, in large power distance countries (India, Japan) people tend to accept the power of others simply based on their hierarchical positions. *Uncertainty Avoidance* captures the society's attitude towards uncertainty and its attempt to cope with anxiety in uncertain situations. Cultures that scored high on

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<sup>9</sup> Chakrabarti et al. (2008) suggest that the higher acquirer announcement returns in cross-border acquisitions are because acquirers perform better deal screening and due diligence, when they acquire targets in culturally distant countries.

uncertainty avoidance tend to prefer rule-based societies, and structured circumstances (Mediterranean countries, Japan). *Individualism* refers to the extent the society helps in reinforcing the individual achievement, whereas *collectivism* emphasizes collective action by individuals. Latin American societies rank among the most collectivist, while the U.S. is one of the most individualistic cultures. *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. Furthermore, a high femininity ranking indicates the country has a low level of differentiation and discrimination between genders. Japan, for example, is considered one of the most “masculine” countries in this regard while Sweden the most “feminine.” These aspects constitute the four dimensions on which societies are calibrated, and scores assigned to nations.

Researchers have used the Hofstede measures to calibrate the four dimensions of a society’s culture, and then used the differences in the measures to capture the idea of “cultural distance” between the countries. Several studies also report that the Hofstede measure is correlated with other measures of culture or trust; for e.g., Chakrabarti et al. (2008) find that Hofstede’s distance measure is positively correlated with the mutual distrust measure of Guiso et al. (2008), indicating that countries with higher cultural distance also display higher mutual distrust. In summary, we note that the Hofstede measure is one of the most used and cited cultural frameworks in international business, management and applied psychology and has been used in several other business disciplines. We compute the cultural distance as follows:

$$\text{Hofstede cultural distance} = \frac{\left( \sum_{i=1}^4 (C_{PC,i} - C_{VC,i})^2 \right)^{1/2}}{4}$$

where,  $C_{PC,i}$  = portfolio company’s culture on measure  $i$ ;  $C_{VC,i}$  = lead VC’s culture on measure  $i$ . The lead venture capital firm in the VC syndicate is defined as the VC firm that has invested the maximum amount in the portfolio company across all rounds of financing.

#### 2.4. Liability of foreignness, home bias, and local investor participation

The institutional, cultural, and social differences among countries further amplify the macroeconomic and company-specific business and technology risks, investors face when investing globally. In general, foreign investors’ unfamiliarity with local investment practices can impact both their investment decisions and success. Theoretical work in international

business and management illustrates that while indigenous firms gain tangible advantages due to their easier access to local information, networks, resources, and knowledge, foreign firms incur higher information and transaction costs arising from their lack of familiarity with the host environment, and thereby suffering from what Kindleberger (1969), Hymer (1960, 1976), and Zaheer (1995) term 'liability of foreignness' or LOF.<sup>10</sup>

In a similar vein, a large body of research has analyzed the 'home bias' phenomenon in which investors exhibit preference for local, more familiar investments. For example, Coval and Moskowitz (1999, 2001) show that mutual fund managers prefer to hold locally headquartered firms and also make substantial abnormal returns from local investments. Similarly, Hau (2001) finds that proprietary traders in the German stock market perform better when they are geographically closer to Frankfurt. Grinblatt and Keloharju (2001) also demonstrate that local language and culture have positive impacts on equity shareholdings and trading. Other studies that provide similar evidence in a cross-country setting include Choe, Kho, and Stulz (2005) who analyze Korean stocks and find that foreign investors purchase shares at higher prices than resident investors and sell them at lower prices. Similarly, Shukla and van Inwegen (1995) show that U.K. money managers underperform American money managers when picking U.S. stocks. These studies suggest that home advantage matters, which gets reflected in local investors' investment decisions and performance.

As well, local VC investors, by virtue of their familiarity with the companies incorporated in home countries and their access to resources and extended information networks, could contribute positively in both screening and monitoring VC investments. Bottazzi, Da Rin and Hellmann (2008b) show that the presence of local partners affects VCs' investment decisions and that having a local partner from the same country as the company increases the likelihood of VC investing. We therefore hypothesize that local investor participation in the VC syndicate contributes positively to the success of portfolio companies. Our fourth hypothesis is: *H<sub>4</sub>: VC syndicates with local investment participation perform better than ones without local VC investors.*

We test these four hypotheses capturing the possible impact of legal, institutional and cultural differences on the likelihood of VC success using the data assembled on VC investments all over the globe. The next section describes data, their sources, and sample statistics.

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<sup>10</sup> A number of studies such as Zaheer (1995), Zaheer and Mosakowski (1997), Miller and Parkhe (2002), and Mezias (2002) establish the existence and persistence of the LOF in different industrial and geographical contexts.

### 3. Data and Sample Statistics

#### 3.1. Data

We source the data from SDC VentureXpert database provided by Thomson Financial. We focus on investments made in private companies all over the world, excluding North America.<sup>11</sup> The primary sample includes all VC investments made between 1996 and 2002, in companies that received their first round of VC funding beginning in 1996. Since our focus is on analyzing the cross-sectional determinants of VC success in an international setting, we consider all VC investments in our sample of countries, irrespective of whether they are made by local or foreign VCs. Of course, presence of local VCs is essential for analyzing the importance of local investor participation. However, the private equity investments in buy-outs of relatively mature companies do not form a part of the study. Since, we track the performance of portfolio companies until the beginning of 2007, the methodology provides for a minimum of four years for a successful exit, consistent with the analysis in Gompers and Lerner (2000a), Hochberg et al. (2007), and Nahata (2008). Companies that do not exit successfully by the beginning of 2007 are classified as unsuccessful exits.<sup>12</sup> Since some of the companies that are private (and coded unsuccessful) at the end of 2006 may eventually exit successfully we primarily employ the Cox hazard framework in our analyses to account for the right-censored feature of our sample, although our results are robust to using the logit models. In addition to analyzing the likelihood of VC success, the hazard models account for timing of the events as well.

The information on successful exits – IPOs and acquisitions – is available in the VentureXpert database, and we carefully supplement it with the data from the New Issues database (for IPOs) and M&A database (for company mergers and acquisitions), also provided by Thomson Financial. It is well known that VC firms reap most of their profits from a small sub-sample of their investments that exit either through IPOs or acquisitions. Previous literature including but not limited to Gompers et al. (2008a), Hochberg et al. (2007), Zarutskie (2007), and Nahata (2008) use occurrence of IPOs and acquisitions as a measure of success of VC firms and their portfolio companies. Hochberg et al. (2007) also show that this measure is a reasonable proxy for VC fund returns.

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<sup>11</sup> Most existing knowledge about venture capital is based on the analysis of VC investments in U.S.; for evidence on VC activity in Canada, and comparison with U.S. VC activity, see Brander, Amit, and Antweiler (2002), Cumming and MacIntosh (2003a, 2003b), and Cumming (2006).

<sup>12</sup> The average time to exit measured as the difference between the company's exit date (IPO/acquisition date for successful and beginning of 2007 for unsuccessful exits) and the date of first VC investment in the company is 24.5 quarters, which is comparable to the average time to exit of 24 quarters for VC investments in the U.S., measured similarly in Hochberg et al. (2007). For successful exits only the average time to exit is 14.2 quarters.

From the VentureXpert database, we extract other relevant information on the portfolio companies and the VCs, including the size of the VC syndicate, identities of the VC investors, identity of the lead VC firm based on the total investment made by each VC firm in the portfolio company, VC age, countries in which VC firms and portfolio companies are headquartered, companies' developmental stage, and their industry.

Our other sources of data are diverse. We extract the country-specific law variables from the data maintained by LLSV on their website, which we use to construct the cumulative shareholder rights, aggregated enforcement rights, and finally, the legal index. A measure of country-specific corruption, one of the constituents of enforcement rights, is procured from Transparency International. We obtain the Hofstede measures of culture from Geert Hofstede's Website, and use them to compute the cultural distance between the countries of the portfolio company and the lead VC investor. Next, we extract the information on annual number of IPOs in a given country from the SDC's New Issues database, and country population from World Bank World Development Indicators, both of which are used to measure the stock market development in the country. The information on country GDP is also procured from World Bank World Development Indicators. To measure stock market conditions in a given country, we use the country-specific Morgan Stanley Capital International (MSCI) indices. Finally, we access the Penn World Tables for data to measure the degree of openness of a given country's economy to international trade. Country GDP, stock market conditions, and country openness allow us to control for macroeconomic conditions.

We impose the following filters on our data. First, we exclude VC investments that are made after the company is involved in an IPO or an acquisition, since they are impertinent to our analyses. Second, we exclude countries that did not witness VC investments in at least fifteen companies over the seven-year period to improve the signal to noise ratio and mitigate the adverse impact of outliers. Finally, since we extensively use country-specific information in our analyses, we are limited to focusing on countries covered by all the data sources. Our final data sample consist of VC investments in 9,153 portfolio companies based in 32 countries, for which relevant company, country, and VC firm information are available.

Table 1 presents the country-wise distribution of VC investments made in developed and emerging economies between 1996 and 2002, and their status at the beginning of 2007. We use

the MSCI Barra classification to categorize countries into developed and emerging economies.<sup>13</sup> Three points are notable. First, about 23% of the VC backed portfolio companies are based in emerging economies. Second, no single country dominates the sample: UK, the largest country in terms of number of VC backed portfolio companies, contributes less than 20% to the sample. Finally, 18.1% of the VC backed portfolio companies in developed economies are successful, compared to 13.7% in emerging economies. The successful exit rate—based on IPOs and acquisitions of portfolio companies—is lower than that observed for U.S. based portfolio companies that have exit rates around 25% (Hochberg et al., 2007; Nahata, 2008).

### **3.2. Sample Statistics**

#### *3.2.1. Legal rights and protection*

As discussed before, we construct a country-specific legal index by incorporating the aggregate shareholder rights, cumulative enforcement rights, and accounting standards in each country. The advantage of aggregating these constituents into a single legal index is the reduction in multicollinearity problem that would otherwise occur if these distinct variables are introduced simultaneously in the analyses. For instance, the country-specific accounting standard is significantly correlated with both aggregate shareholder rights ( $\rho=0.46$ ) and cumulative enforcement rights ( $\rho=0.57$ ). Not surprisingly, we obtain better power in our tests when we use the legal index rather than the individual components constituting the index. *Ceteris paribus*, a higher legal index reflects better investor protection, which is not only more conducive for attracting investments, but also results in higher valuations (LLSV, 1997; 1998).

Table 2 shows the average value of the legal index associated with successful and unsuccessful VC exits. The legal indices differ significantly at the one percent level, suggesting that VC success gets compounded in an atmosphere of better legal protection, which is consistent with Cumming et al. (2005).

We also test for differences in the legal indices across successful and unsuccessful VC exits on the sub-samples of developed and emerging economies. The p-values in columns 8 and 11 of Table 2 denote the significance levels for tests of equality of means on data pertaining to developed and emerging countries respectively. Consistent with overall findings, we observe similar significant results in developed countries. Interestingly, legal rights and protections are

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<sup>13</sup> The criteria to classify a country as developed or emerging is somewhat subjective (see footnote #4 in Lerner and Schoar, 2005). However, all our results continue to be robust when we use their criterion, which is based on the classification by the Organization for Economic Cooperation and Development.



significantly higher for successful VC exits in emerging economies as well. This finding is analogous to the evidence on private equity transactions reported in Lerner and Schoar (2005).

### 3.2.2. *Stock market development*

To assess country-specific stock market development, two commonly used measures are stock market capitalization and aggregate share turnover. However, these measures can be dominated by a few large companies, and may not be sufficiently indicative of the level of a country's stock market development.<sup>14</sup> In many countries, particularly emerging, stock market capitalization and share turnover have increased manifold over the years. But, a high market capitalization or trading volume do not necessarily translate into a mature and vibrant stock market where a large number of companies have access to equity capital. Rajan and Zingales (2003) also emphasize that financial systems in which capital availability is restricted to a select few firms, cannot be considered financially developed. Consistent with their argument, Cumming et al. (2005) do not find a significant impact of stock market capitalization on VC success.

We therefore construct a novel measure of stock market development, which has a particular relevance for venture capitalists. Our measure is based on IPOs that is the first choice of exit for VCs because of their highest average profitability. We cumulate the number of IPOs that occurred in a country from 1993 up until a given calendar year and normalize it by the population (in million) of that country in the same calendar year. A greater number of IPOs denotes that the country's stock markets are more receptive to equity issues by companies going public, and cumulating the number of IPOs over several years adjusts for fluctuating stock market conditions that may positively or adversely affect the number of stock offerings in certain years. Finally, normalizing the cumulative number of IPOs by population facilitates a more meaningful comparison across countries of different sizes (Rajan and Zingales, 2003). We measure the country's stock market development prior to the year of first VC investment in the portfolio company. Thus for example, in case of companies initially funded in 1996, stock

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<sup>14</sup> For example, Buysschaert, Deloof, and Jegers (2004) report that in 1999, the twenty largest Belgian companies accounted for 78% of the market capitalization on the Brussels Stock Exchange. In a similar vein, Hoye and Lerner (2002) point out that immediately prior to the Mexican Peso Crisis, the four largest Argentinian companies accounted for 58% of the market capitalization in 1994. See also Leeds and Sunderland (2003) who citing the IFC/Standard & Poor's *Emerging Market Fact Book* (2000) report that in Latin America 58% of the average daily trading volume on the major stock exchanges is dominated by the ten largest firms in each country; the percentage in Asia being only slightly lower at 42%.

market development is based on cumulative IPOs in the country between 1993 and 1995, and the population in 1995.<sup>15</sup>

We observe from Table 2 that stock market development significantly facilitates VCs' successful exits. Consistent with Black and Gilson (1998), the measure of stock market development associated with successful VC exits is significantly higher than that associated with unsuccessful VC exits. This pattern holds for VC exits restricted individually to developed and emerging economies as well. The mean values of stock market development across all investments (not reported) are 9.74 for developed countries and 4.14 for emerging economies.

### 3.2.3. Cultural differences

As mentioned earlier, we use the Hofstede's measures of country culture to account for the cultural differences between countries. Recall, that we compute the cultural distance based on the four measures of country culture—power distance, uncertainty avoidance, individualism, and masculinity—as follows:

$$\text{Hofstede cultural distance} = \frac{\left( \sum_{i=1}^4 (C_{PC,i} - C_{VC,i})^2 \right)^{1/2}}{4}$$

where,  $C_{PC,i}$  = portfolio company's culture on measure  $i$ ;  $C_{VC,i}$  = lead VC's culture on measure  $i$

Table 2 reports the measures of cultural distance between the portfolio companies, and their lead VC investors for successful and unsuccessful exits. The average cultural difference of 4.42 for successful exits is significantly higher than 3.29 for unsuccessful exits.<sup>16</sup> This is consistent with the expectation that VCs are more careful in deal screening and due diligence before investing in culturally distant countries. We also obtain significant differences in cultural distance across the two categories of VC exits in both developed and emerging economies.

### 3.2.4. Local investor participation

Syndication of investments is a characteristic feature of the VC industry with a majority of investments having co-investors. In general, syndication spreads the VCs' risk, allows for an independent appraisal on the start-ups' potential, and increases monitoring and management

<sup>15</sup> For robustness, we evaluate other measures of stock market development, which are discussed in section 4.4.

<sup>16</sup> Sri Lanka, one of the countries in our sample, is not calibrated on the Hofstede cultural measures. We use the cultural scores pertaining to India instead. However, our results are qualitatively similar upon excluding Sri Lanka from our analyses.

support. Moreover, there is likely to be a quid pro quo arrangement among syndicate members to participate in future VC syndicates led by other VC firms. In the VC context, Lerner (1994a) provides the first evidence that VC syndication positively influences company success through better deal screening, due diligence, and complementary value added by syndication partners. Using data from Canadian VC investments, Brander, Amit, and Antweiler (2002) provide evidence that syndicated VC deals have higher returns. More recently, using U.S. data, Nahata (2008) shows that syndicated deals have a higher likelihood of success. In light of previous evidence, we control for VC syndication in our analyses which also allows us to shed light on whether VC syndication contributes to the success of portfolio companies internationally.

We determine the performance implications of syndication in multiple ways. First, we measure the size of the VC syndicate in each portfolio company. The average VC syndicate comprises of 4.3 (3.4) VCs for successful (unsuccessful) portfolio companies with the difference being significant at the one percent level.

Second, we control for the presence of a U.S. based VC firm in the venture capital syndicate. Since U.S. headquartered VCs have been around for a longer time period and the U.S. is by far the biggest VC market in the world, on average, we expect U.S. based VCs to be more experienced and more likely to lead their portfolio companies to successful exits. Furthermore, U.S. style venture capital contracts have been found to be more efficient both in terms of performance as well as their increased worldwide adoption through the years (Kaplan, Martel, and Stromberg, 2007). In line with our expectation, we find that portfolio companies that have U.S. based VCs in their syndicates are more likely to be successful. Of the portfolio companies that exited successfully (unsuccessfully), 26.7% (17.4%) involved a U.S. based VC firm in the VC syndicate, and this difference is significant at the one percent level.

Upon restricting our analysis individually to the developed and emerging economies, we continue to find that larger VC syndicates and presence of a U.S. based VC firm are significantly more likely to be associated with successful VC exits. The average syndicate comprises of 4.7 (3.8) VCs for successful (unsuccessful) portfolio companies in developed countries, and 2.6 (2.0) VCs for successful (unsuccessful) VC exits in emerging economies. In developed countries, of the portfolio companies that exit successfully (unsuccessfully), 27% (18.6%) involve a U.S. based VC firm in their VC syndicates, while in emerging economies the respective percentages are 25.8% and 13.8%.

More importantly, our third element of VC syndication is local investor participation, which as theory predicts, should mitigate the LOF problem. Our data, that include VC

investments by both local and foreign investors, give us a unique opportunity to ascertain the value added by local investors in the VC syndicate. For determining the performance implications of local investor participation, we interact the indicators for U.S. based VC firm and local VC investor in the VC syndicate.<sup>17</sup> Given the evidence above, a U.S. based VC firm is expected to positively contribute by way of experience and VC industry expertise, while local VC investor participation is likely to mitigate the LOF problem. In line with our expectation, we find that VC syndicates containing both U.S. headquartered VC firms and local VC investors are nearly twice as likely to lead their portfolio companies to successful exits. Of the portfolio companies that exit successfully (unsuccessfully), 14.2% (7.7%) involve both a U.S. based VC firm and a local VC investor in their VC syndicates. We obtain similar significant differences in the sub-samples of developed and emerging economies.

### *3.2.5. Other control variables*

There is consistent evidence in U.S. venture capital market that experienced VCs attract better companies as well as provide better monitoring and supervision to their portfolio companies thus increasing the chances of their success. For example, Lerner (1994b), Hochberg et al. (2007), Sorensen (2007), and Nahata (2008) show that more experienced VCs have a significant positive impact on their portfolio companies. We control for VC experience in our analyses and use the age of the lead VC firm to measure its VC industry experience. We focus on the experience of the lead VC investor since the lead VC will have the most influence in the VC syndicate and is also most likely to have one or more board seats (Barry et al., 1990; Gompers, 1996). The lead VC firm is defined as the VC with the largest investment in the portfolio company. We measure the lead VC age in the year prior to its first investment in the portfolio company. The average age of the lead VCs whose portfolio companies exit successfully (unsuccessfully) is 13.77 (11.37) years, the difference being statistically significant. We obtain significant differences in VC experience across successful and unsuccessful exits individually in developed and emerging countries as well.

Beginning with Lerner (1994b), several studies have shown VCs timing their exits, particularly the IPOs, with ‘better’ market conditions. More recently, Hochberg et al. (2007)

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<sup>17</sup> The indicator denoting presence of a local VC firm, by itself, is not significant in explaining portfolio company performance. The venture capital industry has long been dominated by better experienced U.S. VC firms. Non-U.S. based local investors are likely to be inexperienced and lack VC industry expertise which take time to develop. This lack of experience and expertise can have a countervailing impact on their home advantage (access to resources, networks, and information), which is consistent with our finding.

provide evidence that better stock market conditions facilitate successful VC exits through IPOs and acquisitions. To account for the impact of market conditions on VC exits, we specifically control for the exit market environment using the country-specific MSCI stock indices.

First, we compute the country-specific six-monthly MSCI stock index return prior to the successful exit of each portfolio company based in that country. This measure is lagged by a quarter so as to allow a typical company and its investors up to three months to prepare for an impending exit by way of an IPO or an acquisition. Second, for unsuccessful exits we use the average of the country-specific six-monthly MSCI stock index returns computed on a monthly rolling basis over the entire time period from the portfolio company's initial funding year until 2006, when VC exits could occur.

As observed in Table 2, the average six-monthly stock index return is significantly different across successful and unsuccessful exits. Analyzing separately the developed and emerging economies, we do not observe a significant impact of stock market conditions on VC success in emerging countries. On the other hand, in developed countries we do find that better stock market conditions are positively related to the likelihood of VC success in a statistically significant way.

We control for a country's macro-economy through two other factors: the natural logarithm of GDP, and the country's openness to trade. As observed from Table 2, the average country GDP is higher for companies that exit successfully through IPOs or acquisitions. We obtain a similar qualitative pattern in country GDP when analyzing developed economies. However, when restricting our analysis to emerging economies, the pattern reverses, and the average country GDP is significantly lower for companies that exit through IPOs or acquisitions.

The country's openness to trade – defined as the ratio of total trade including exports and imports to country GDP - has a significantly negative impact on VC success. Similar to country GDP, the country's openness to trade is measured as of the year prior to the year of first VC investment in the portfolio company. The average measure of country's openness is significantly lower for companies that exit successfully through IPOs or acquisitions. A similar qualitative pattern emerges for VC exits in developed countries. This is somewhat consistent with the notion that more open countries are relatively more attractive for VCs, and increased competition among VCs for prospective deals in these countries results in the 'money chasing deals' scenario, depressing VC performance (Gompers and Lerner, 2000b). However, when restricting our analysis to emerging economies, a country's openness is not significantly different across the two categories of VC exits.

Finally, we create an indicator variable denoting whether the first investment in the portfolio company occurred at the ‘seed’ or ‘early’ stage of development. Companies in early stages of development are likely to be riskier and this may impact their performance. Consistent with this logic, we observe that among successful (unsuccessful) exits, 31.8% (43.2%) of all VC investments were first made at the seed/early stage, the difference being statistically significant. This pattern holds strongly in a significant way in both developed and emerging economies.

### 3.2.6. *Correlation of variables*

Next, we discuss the pair-wise correlations of the primary variables used in our empirical tests. As observed from Table 3, legal index is not very correlated with variables measuring cultural distance ( $\rho=-0.04$ ) and local investor participation ( $\rho=0.06$ ). The legal index is moderately correlated with country GDP ( $\rho=0.12$ ) indicating that higher GDP countries also have better legal rights and protections. On the other hand, it is highly correlated with stock market development ( $\rho=0.60$ ).<sup>18</sup> The stock market development is also positively correlated with country openness ( $\rho=0.38$ ); however its correlations with other variables are low.

The correlations of cultural distance with our primary variables measuring legal rights and protections, stock market development and local investor participation are relatively low. However, cultural difference is highly correlated with the two variables that measure VC experience; its correlation with lead VC age being 0.21 and with the indicator variable denoting U.S. VC presence in the syndicate being 0.48. These relatively high correlations suggest that better experienced VCs are more likely to invest in companies from culturally distant nations. This is also consistent with the notion that the better due-diligence and screening abilities of more experienced VCs enable them to be successful in culturally distant transactions.

The three variables that capture VC syndication—size of the VC syndicate, presence of a U.S. based VC firm, and presence of both a U.S. based VC firm and a local VC firm—are highly correlated with each other as expected. However, the indicator denoting presence of both a U.S. based VC firm and a local VC firm in the syndicate (measuring local investor participation) is not highly correlated with our other primary variables measuring law, cultural distance, and stock market development. Overall, the low correlations among most variables alleviate to a large degree, potential concerns about multicollinearity.

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<sup>18</sup> Although the reported regressions include both the legal index and stock market development our findings remain robust to including only one of the two variables in our model specifications.

#### **4. Multivariate analysis of VC success in international VC investing**

We now turn to a multivariate analysis of VC success likelihood, where potential determinants of VC success are more precisely controlled for in the Cox hazard framework.

##### *4.1. Performance of VCs in international VC investing*

We analyze the determinants of global VC success in a Cox hazard framework and present the results in Table 4. The dependent variable is the natural logarithm of time to exit which is measured from the date of first VC investment in the portfolio company. The Cox model is a semi-parametric model in which the hazard function is not dependent on a specific distribution of the survival time. The time to exit is censored for unsuccessful VC investments that have not exited by the beginning of 2007. In the Cox hazard framework, a positive (negative) coefficient on the variable implies a higher (lower) hazard for that variable and hence a lower (higher) expected duration. In other words, given that the company is still private at time  $t-1$ , the hazard at time  $t$  is the probability that the company will successfully exit through an IPO or an acquisition.

We relate the likelihood of company success to the following variables: legal index, stock market development, Hofstede cultural distance, an indicator variable denoting presence of a U.S. based VC firm and a local VC investor in the VC syndicate, VC experience, VC syndicate size, stock market conditions at the time of exit, country GDP, country openness, and an indicator variable denoting investment by the lead VC at the seed or early stage of company's development. Though not reported in the tables, we include industry indicators for each portfolio company, using the VentureXpert industry definitions. Broadly, the data cover and specify the following six industries: biotechnology, communications/media, computer related, medical/health/life science, non high-technology, and semiconductors/other electronics. By including industry indicators, we also partially account for differences in technological and industrial characteristics of the portfolio companies.

While models 1 and 2 in Table 4 are estimated without one of the measures of VC experience (lead VC age), model 3 contains lead VC age. We estimate these models sequentially because data limitations decrease the sample size. Across the models 1-3, we observe that a higher value of legal index has a positive impact on the likelihood of VC success, which is consistent with Cumming et al. (2005). Thus better legal rights and protection not only attract investments, but also have an appreciable impact on their success. In terms of economic

significance, based on the estimates in models 1-3, a one standard deviation increase in the legal index is associated with a 21.8%–24.7% increase in the hazard of a VC’s successful exit.

Consistent with the Black and Gilson (1998) theory on the linkage between stock market development and VC industry growth, we find that developed stock markets have a strong positive impact on VC performance. Better developed stock markets facilitate successful VC exits through IPOs and acquisitions spurring future VC industry growth. A one standard deviation increase in stock market development is associated with a 9.4% - 11.4% increase in the hazard of a VC’s successful exit depending on the estimates in models 1-3.

We find that in all specifications, cultural distance has a positive impact on VC performance, consistent with the hypothesis that VCs investing in culturally distant nations are aware of cultural disparities, and take meaningful steps in terms of better screening and due diligence of their portfolio companies, which results in better performance. A one standard deviation increase in Hofstede’s cultural distance is associated with a 9.3%–12.1% *increase* in the hazard of a VC’s successful exit, based on the three model configurations. There is thus no evidence that cultural disparities between nations negatively impacts international VC performance. The finding of a positive impact of cultural distance on VC performance is consistent with the evidence presented in Chakrabarti et al. (2008) in the context of performance of cross-border acquisitions.

Consistent with the findings in Brander et al. (2002) and Nahata (2008), VC syndication, captured by the size of VC syndicate, has a beneficial impact on company performance. We also find that the presence of a U.S. headquartered VC firm in the VC syndicate has a positive impact on portfolio company performance, but only when we do not control for local investor presence.

In models 2 and 3, we account for local investor participation to test whether presence of local VCs has a beneficial impact on company performance. Local VC investors based in the same country as the portfolio company, can have an advantage in locating more promising investments, and can positively contribute in terms of pre-investment screening and due diligence, and post investment monitoring. To test this hypothesis we add an indicator variable that denotes presence of both a U.S. based VC firm and a local VC investor in the venture capitalist syndicate. A significant positive coefficient on this indicator variable will suggest that the participation of both a U.S. based VC firm and a local VC firm results in better portfolio company performance. We find this indeed to be the case; furthermore, the indicator variable denoting the presence of a U.S. based VC firm in the VC syndicate is rendered insignificant. This suggests that local VC investor participation in conjunction with investment by a U.S.



based VC firm is really the primary channel (rather than simply the presence of a U.S. based VC firm) that positively affects VC and portfolio company performance. In terms of economic significance, the indicator capturing local investor participation is associated with a 10.1%–10.7% increase in the hazard of a VC’s successful exit based on the models in Table 4. In summary, our primary results are strongly supportive of the four hypotheses.

Our other results are as follows. When introduced in model 3, we find that lead VC age has a significant positive coefficient suggesting that VC experience has a beneficial impact on international VC investing as well. Experienced VCs are able to replicate success across national boundaries. Across all specifications, we find stock market conditions, measured by the six-monthly return on country-specific MSCI index prior to VC exits, strongly influence the likelihood of successful VC exits. The variable denoting country’s openness has a marginally significant negative coefficient in the third model, consistent with our univariate findings. The coefficient on country GDP is positive but not significant in any of the models. Finally, lead VCs that make investments at the seed or early stage in a company’s lifecycle are more likely to fail, which is a reflection of the riskier nature of early stage investments.

#### *4.2. Performance of VCs in developed and emerging economies*

There has been a recent spate of interest in emerging market investing. As mentioned earlier, approximately 23% of the VC-backed companies in our sample are based in emerging economies. While it is interesting to study the determinants of VC success in general, it is informative to analyze the incremental impact of institutional and cultural differences on VC success in emerging countries relative to the developed economies. In a related test, we analyze the determinants of VC success in sub-samples of developed and emerging economies as well.

In Table 5, we first analyze the incremental impact of institutional and cultural differences on VC success in emerging economies relative to the developed countries, by introducing an indicator variable, which denotes whether or not the portfolio company belongs to an emerging economy. Along with this indicator, we introduce interactions of the emerging economy dummy with i) Hofstede culture distance, and ii) local investor participation. We do not include interactions of the emerging economy dummy with legal index and stock market development, since these interactions are very highly correlated with the emerging economy indicator itself. The correlation of emerging economy dummy with its interaction with legal index is 0.996, and with its interaction with stock market development is 0.751. The two variables capturing interactions—legal index interacted with emerging economy dummy and

stock market development interacted with emerging economy dummy—are also highly correlated ( $\rho= 0.779$ ).

As before, the variable denoting local investor participation is introduced in model 2 and lead VC age in model 3. While our primary variables of interest—legal index, Hofstede culture distance, local investor participation, and stock market development—continue to stay significant, mirroring our earlier results, our main focus is on the emerging economy indicator and its interactions. The emerging economy indicator itself is not significant in any of the models although it possesses a negative coefficient, which is consistent with our univariate finding that VC success rate is lower in emerging economies than developed countries.

The interaction of emerging economy dummy and the Hofstede culture distance is significantly positive, suggesting that a higher cultural disparity between the lead VC investors and their portfolio companies based in emerging economies is associated with a higher likelihood of VC success. VCs rationally anticipate significant cultural differences and the potential challenges arising thereby when investing in emerging countries, and hence are likely to spend significant upfront effort in proper screening and due diligence of these investments. Thus, if VCs set a higher bar for their investments in culturally distant nations, particularly in more risky emerging economies, and yet make those transactions, the investments are likely to be of better than average quality. In turn, this leads to a higher likelihood of VC success.<sup>19</sup>

On the other hand, the interaction of emerging economy dummy and the indicator denoting local investor participation is significant in one of the two specifications. This interaction carries a negative coefficient that suggests that local investor participation is more important for VC success in developed economies than emerging economies. Local investors in emerging economies are likely to be inexperienced in venture capital investing and are therefore unable to exploit their home advantage to contribute significantly to the likelihood of portfolio company success.

We next analyze the determinants of VC success separately in developed and emerging economies by utilizing the same set of explanatory variables as earlier and report the results in Table 6. These analyses allow us to report the determinants of VC success in both developed and emerging economies separately and also provide robustness for our earlier findings.

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<sup>19</sup> Consistent with this result we obtain a higher average cultural distance when the lead VC firm and the portfolio company come from different types of economies, particularly when portfolio companies belong to emerging countries. The average cultural distance is significantly lower when both lead VC firm and portfolio company belong to the same type of economies. This suggests VCs pay extra attention to deal screening and due diligence when investing in emerging economies.

While models 1 and 2 pertain to the developed country sample, the latter two models report the analyses on emerging economies. The overall results indicate that legal index, Hofstede culture distance, and stock market development continue to be robust predictors of VC success internationally, in both developed and emerging economies. On the other hand, while local investor participation matters in developed economies, it does not emerge significant in emerging countries, which is consistent with the results in Table 5. VC experience measured by lead VC age is a significant predictor of company performance in developed countries but not in emerging economies. However, syndication captured by the size of VC syndicate is economically important in both types of economies. Consistent with our univariate comparisons, stock market conditions are strong predictors of VC success in developed countries but not in emerging economies. While country GDP is largely insignificant in predicting VC success in both types of economies, country openness has significantly negative coefficients, consistent with our earlier findings. Finally companies that are funded at their seed or early stages are significantly less likely to succeed irrespective of where they are based.

The significance of legal index and stock market development suggests that economically emerging nations desiring to spur local VC industry should take adequate steps to improve their legal systems and develop their stock markets. While a better legal system is prone to attract investors in general, it is immensely important for venture capital investors that face considerable information asymmetries, both at the company level and the macroeconomic level, when they invest in emerging companies. Effective enforcement of law is likely to significantly mitigate VCs' risk, which is markedly higher in emerging countries.

In a similar vein, stock market development matters as well. The venture capital activity is best characterized as a cycle constituting primarily four activities – fund raising, sorting/investing, monitoring, and harvesting. The success of VCs in the last stage–harvesting–which is crucially dependent on exits through IPOs and acquisitions significantly contributes to VC reputation, which in turn critically helps in their next round of fundraising. As much as availability of investment opportunities, their selection, and their monitoring are important, harvesting and adequate channels to realize successful VC exits are equally important for the development of the VC industry and its ecosystem.

#### *4.3. Cultural distance, due diligence, and VC success*

As mentioned earlier, cultural distance between the portfolio company and the lead VC investor is likely to be associated with a higher degree of distrust that essentially arises from the

macro-level unfamiliarity surrounding the portfolio company. While VC investments, to begin with, are fraught with risk, investing in unfamiliar cultures further multiplies the uncertainty for non-local VC firms. To mitigate risk, VC firms are likely to engage in more rigorous screening and evaluation of their portfolio companies, particularly those from unfamiliar cultures. Furthermore, VC firms with better screening and evaluation technology are more likely to invest in culturally distant nations by taking advantage of their better due diligence capabilities. Our evidence on a significant positive correlation of 0.21 between the lead VC age and cultural distance supports this conjecture, and suggests more experienced firms are better inclined to invest in culturally distant countries.

While we conjecture that a higher cultural distance is associated with increased screening and due diligence which then leads to a better success record for VCs, we can more formally exploit the observed tendency of experienced VCs being more likely to be involved in culturally distant transactions, to construct a measure of VC due-diligence and then incorporate it directly in our multivariate analysis. A significantly positive coefficient on the due-diligence measure would support the idea that better screening and evaluation of companies does result in a higher success rate for VC firms. Although imperfect, this is our modest attempt to construct a measure of due-diligence and determine its impact on VC success, given the inherent challenge in measuring a latent variable like due-diligence.

In the formal test, we first regress VC experience (lead VC age) on Hofstede culture distance and obtain the fitted values and residuals. The fitted value obtained is likely to be correlated with that aspect of VC experience that is best explained by culture distance. VC experience (or reputation) is essentially based on VC's track record, ability, and expertise, and is likely to reflect both screening and monitoring capabilities of the VC firm. Since higher cultural disparity is likely to be associated with more thorough screening and evaluation, and the VC age is measured at the time of VC's first investment in the portfolio company, the fitted values largely reflect VCs' due-diligence of their portfolio companies, when VCs first invest in them. On the other hand, the residuals largely capture aspects of VC experience related to the value added by the VCs as they monitor and manage the portfolio companies to successful exits.

Having broken down VC experience into two elements one of which arguably measures VC due-diligence, we introduce the two components—fitted values and residuals in our regressions predicting VC success. The model configurations are those reported in Table 7. We use the fitted values and residuals from the first stage while excluding Hofstede culture distance and VC experience (lead VC age) from our specifications. To study the importance of VC due-

diligence in emerging economies, we interact the fitted value with the emerging economy indicator. Significant positive coefficients on both the fitted value and the interaction variable would support the hypothesis that VC investment in culturally distant nations, and particularly in emerging economies, is related with better ex-ante screening and evaluation of portfolio companies, which in turn results in a higher likelihood of success. Indeed, our results in Table 7 show that the fitted value (measuring VC due diligence) as well as its interaction with emerging economy indicator are highly significant across all specifications.<sup>20</sup> Our other primary results on the influence of law, stock market development, and local investor participation on VC success continue to be robust across all models.

#### *4.4. Robustness tests*

The Hofstede cultural distance captures in aggregate, four aspects of culture – power distance, uncertainty avoidance, individualism vs. collectivism, and masculinity vs. femininity. To determine the importance of individual cultural elements, we replicate our analyses of Table 4 by introducing each of the four cultural aspects sequentially in place of the aggregate measure of culture distance. Specifically, we use the absolute value of the difference between lead VC's and portfolio company's cultures, measured on each of the four dimensions. For example, to measure the cultural disparity reflected in power distance when a U.S. based VC firm invests in India, we use the absolute value of the difference between power distances of the two individual countries, U.S. and India. We code similarly for the other three dimensions of culture. Not surprisingly, all the four dimensions of cultural distance are highly correlated with each other.

We report the most inclusive, the third model of Table 4 for each of the four dimensions of cultural distance. Table 8 which presents the results of this analysis shows that cultural distance measured on each of the four components emerges significant in predicting VC success. However, the economic significance varies among the four elements of culture. Depending on the cultural element, a one standard deviation increase in cultural distance is associated with a 4.5%–9.4% increase in the hazard of a VC's successful exit.

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<sup>20</sup> In other tests, first, we interact the Hofstede culture distance with an indicator denoting younger lead VC firms (younger VC firms are classified as such if the VC's age is in the bottom quartile of all lead VCs that invested in a given year) and find that the interaction variable is negative, although insignificant. This is consistent with the notion that younger or less experienced VCs are not as able in screening and due-diligence of their portfolio companies thereby adversely affecting the probability of a successful VC exit. Second, further analysis also reveals that the positive impact of cultural distance on VC success is not driven by U.S. based VC firms, but is rather more broad based.

For further robustness, we consider the Eurobarometer measure of bilateral trust among nations used in Guiso et al. (2008) and Bottazzi et al. (2008b). Chakrabarti et al. (2008) find a negative correlation between the Hofstede culture distance and the Eurobarometer measure, which indicates that higher cultural distance between countries is associated with lower level of mutual trust. We replace the Hofstede distance with the Eurobarometer measure in all our regression specifications although we lose more than half the observations since many country-pairs in our sample are not covered by the Eurobarometer surveys. In all specifications we obtain a negative coefficient on the bilateral trust measure which suggests that lower level of trust between the countries of the lead VC investor and the portfolio company leads to a higher probability of a successful VC exit. Although in some specifications, the negative coefficient is not significant, the overall evidence is consistent with our earlier results.<sup>21</sup> We do not intend to claim that a higher level of trust, which has been shown to influence VC investment decisions, results in a lower level of success. Rather, a higher level of mutual distrust and awareness of cultural differences among the parties makes investors cautious and creates incentives for better ex-ante screening and due diligence, so transactions involving high cultural disparity or distrust materialize only when they have substantial economic potential. Such careful investment in portfolio companies leads to a relatively higher likelihood of VC success.

Next, we evaluate the robustness of our results using two different measures of country-specific stock market development. Recall that our primary variable is based on the cumulative number of IPOs in a country normalized by its population. Our first alternate variable is based on the cumulative number of IPOs in a country divided by the cumulative GDP of the country. As before, we measure the stock market development prior to the year of first VC investment in the portfolio company. For our analyses, we create an indicator variable that equals one when the stock market development is greater than or equal to the median value in the sample, and zero otherwise. Among successful (unsuccessful) portfolio companies, about 55% (49%) belonged to countries with better developed stock markets, the percentages being significantly different from each other. When we replicate our analyses (with one exception) using this alternate measure, we continue to find that developed stock markets are an important factor for VC success. The one exception is when introduced simultaneously with legal index this measure of stock market development is not significant, which could be due to the high correlation of 0.50 between the two variables.

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<sup>21</sup> In univariate comparisons the average level of bilateral trust associated with successful exits is 3.22, which is significantly different from the average of 3.26 associated with unsuccessful exits.

Our second alternate measure of stock market development is based on the number of listed companies in a country. We divide the number of listed companies by the country population, and create an indicator variable equal to one when the stock market development is greater than or equal to the median value in the sample, and zero otherwise. Among successful (unsuccessful) portfolio companies, about 62% (50%) belonged to countries with better developed stock markets, the percentages being significantly different from each other. When using this measure, most results remain qualitatively unchanged. One exception again is when simultaneously introduced with the legal index, this measure of stock market development is not significant, probably caused by the very high collinearity ( $\rho=0.75$ ) between the two variables.

Finally, we re-estimate our results explicitly accounting for endogeneity resulting from possible matching of better portfolio companies with more experienced VCs. In so doing we address the potential concern that better experienced VCs that are more prone to investing in culturally distant nations, simply happen to match with better quality companies. This two-sided matching may account for a higher likelihood of VC success, rather than the VCs' due-diligence ability. To address this issue we use a variation of Heckman's (1979) endogeneity correction procedure and first model an experienced VC's likelihood of investing in a portfolio company, in a probit framework. The dependent variable in the selection equation equals unity when the lead VC's age is greater than or equal to the age of the top quartile of all lead VCs that invested in a given year, and zero otherwise. The explanatory variables reflect characteristics of the portfolio company, investee country, and the lead VC firm, and include the total amount of VC funding received by the portfolio company, the legal index of the investee country, its stock market development and GDP, and indicator variables for the three countries (US, UK, and South Korea) whose lead VC firms account for at least ten percent of VC investments in our sample. We report two specifications for the first stage, one with and the other without Hofstede culture distance to establish robustness. Since cultural distance is related to VCs' investment sorting, we believe the two different specifications better alleviate concerns about potential endogeneity affecting our results. In the second stage, we add the inverse Mills ratio received from the first-step probit regression as an additional regressor in the hazard analysis of VC success. The results are reported in Table 9.

The results from the selection equation estimation indicate that an investment by experienced lead VC is more likely if the portfolio company is of better quality and receives higher VC funding, which is consistent with the two-sided matching. Also, when the investee country has a higher GDP, experienced VCs are more likely to invest. Less experienced VCs are

apt to avoiding countries having lower legal protections, which explains the negative coefficient on legal index. Expectedly, lead VC firms from the US and UK are more likely to be experienced. Finally, consistent with the results in Table 7, experienced lead VCs are more likely to invest in culturally distant transactions. The specification of the selection equation is notable since most explanatory variables in the predictive model of experienced VC backing are statistically significant. More importantly, the inverse Mills ratio emerges significant in both the second-stage models (the last specification of Table 4) but even so our main results remain qualitatively and quantitatively unchanged. Thus, while it is important to control for the selection bias associated with VCs' choice of (and the quality of) their portfolio companies our primary results continue to remain robust.

## **5. Concluding remarks**

We provide an analysis of the cross sectional determinants of success in international venture capital (VC) investing. To do so, we assemble the largest-to-date dataset comprising international VC investments in both developed and emerging economies. Using these data, we test hypotheses that relate institutional and cultural differences among countries to the likelihood of VC and portfolio company success.

Specifically, we capture these differences by the variation in their legal rights and protection, the extent of stock market development, and cultural differences between the countries of companies and their VC investors. We find these factors strongly impact the likelihood of VC success in both developed and emerging economies. We also analyze the impact of presence of local investor participation that serves to mitigate the 'liability of foreignness' problem arising from the institutional and cultural disparities among countries. While the presence of local investors in VC syndicates increases the likelihood of company success in developed countries, it does not have a significant impact on company success in emerging economies. This indicates venture capital investing is a relatively recent phenomenon in most emerging countries, and therefore local investors may not possess relevant expertise and experience to enhance the likelihood of portfolio company success. Finally, we provide evidence consistent with the notion that VCs are likely to engage in more intensive screening and due-diligence when they invest in culturally distant nations and particularly in emerging economies, which in turn contributes significantly to VC success.

It is noteworthy that the institutional and cultural factors identified in this study have particular relevance for three of the four critical activities of VC firms. Apart from fundraising,



the other three key activities of any VC firm are identifying and sorting potential investments, adding value by provision of monitoring and expertise, and harvesting investments. The key to success in future fundraising and formation of VC reputation lies in the profitable fulfillment of these three activities. In particular, cultural distance has implications for VC sorting activity, local investor participation for screening and monitoring of portfolio companies, and institutional differences (law and capital markets) for both sorting and harvesting of investments.

In summary, our analysis extends previous research by identifying the legal, institutional, and cultural factors that influence the success of international VC investments. These findings help provide important guidance for nations considering developing venture capital markets to spur innovation and promote entrepreneurship.

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## Appendix: Listing of Variables

<b><i>Legal Rights and Protections</i></b>	
Legal Index	Country-specific legal index constructed by adding country-specific shareholder rights, enforcement rights, and accounting standards, each normalized by their maximum possible value. Shareholder rights are aggregated on six indicator variables: one share-one vote, proxy by mail, cumulative voting, oppressed minorities mechanism, preemptive rights, and unblocked shares prior to meetings (Source: LLSV database). Enforcement rights are an amalgam of five law variables: efficiency of judicial system, rule of law, corruption, risk of expropriation and repudiation of contracts, each assigned ten points (Source: LLSV and Transparency International). Accounting standards are measured on a scale of 0-100 (Source: LLSV).
<b><i>Country Stock Market Development</i></b>	
Stock Market Development	Stock market development is measured by the cumulative number of IPOs in the country from 1993 until the year prior to portfolio company's initial VC investment divided by the country population (in million) in the year prior to the initial VC investment (Source: SDC New Issues database and World Bank World Development Indicators)
<b><i>Country Culture</i></b>	
Hofstede Cultural Distance	Cultural distance between the portfolio company's and lead VC's nations, as measured by the Cartesian distance between Hofstede's four different cultural dimensions for the two nations (Source: Geert Hofstede)
Power Distance	Absolute difference between the values assigned to power distance of the two nations (Source: Geert Hofstede)
Individualism Distance	Absolute difference between the values assigned to individualism of the two nations (Source: Geert Hofstede)
Uncertainty Avoidance Distance	Absolute difference between the values assigned to uncertainty avoidance of the two nations (Source: Geert Hofstede)
Masculinity Distance	Absolute difference between the values assigned to masculinity of the two nations (Source: Geert Hofstede)
<b><i>VC Experience</i></b>	
Lead VC Age (years)	Age of the lead VC firm measured prior to its first investment in the portfolio company (Source: VentureXpert database)
Dummy=1 if VC Syndicate has a U.S. VC Firm	Indicator variable denoting whether the VC syndicate includes a U.S. based VC firm (Source: VentureXpert)
<b><i>Local Investor Participation</i></b>	
Dummy=1 if the VC syndicate has a U.S. VC and a local VC	Indicator variable denoting whether the VC syndicate has both a U.S. VC firm and a local VC investor (Source: VentureXpert)
<b><i>VC Syndication</i></b>	
VC Syndicate Size	Size of the VC syndicate in the portfolio company (Source: VentureXpert)
<b><i>Other Variables</i></b>	
Stock Market Conditions (% Return on MSCI Country Index)	Six-monthly return on the country-specific MSCI stock index, three months prior to a successful VC exit. For unsuccessful VC exits, average of the country-specific six-monthly MSCI stock index returns computed on a monthly rolling basis over the entire time period from the portfolio company's initial funding year until 2006 when VC exits could occur (Source: MSCI country indices)
GDP (\$ Billion)	Country GDP in billions of "year 2000" dollars (Source: World Bank World Development Indicators)
Country Openness (%)	Ratio of Country's Trade (exports plus imports) to Country GDP (Source: Penn World Tables)
Dummy=1 if first VC investment occurred at company's seed/early stage	Indicator variable denoting whether the first VC investment occurred at company's early or seed developmental stage (Source: VentureXpert)

**Table 1: Country-wise Distribution of VC Investments**

The table presents country-wise distribution of VC Investments between 1996 and 2002, in companies that received their first round of VC funding beginning in 1996, and for which relevant data are available. Companies that went public or were acquired between 1996 and 2006, inclusive, are classified as ‘Successful’ Exits, otherwise denoted ‘Unsuccessful’ Exits. The categorization into developed and emerging economies is based on the MSCI Barra classification.

Developed Economies			Emerging Economies		
Country	Successful	Unsuccessful	Country	Successful	Unsuccessful
Australia	115	371	Argentina	5	36
Austria	13	90	Brazil	22	167
Belgium	23	167	India	86	393
Denmark	19	130	Indonesia	1	16
Finland	39	258	Malaysia	15	39
France	132	678	Mexico	2	23
Germany	157	975	Philippines	5	10
Greece	1	16	South Africa	5	32
Israel	28	216	South Korea	87	927
Italy	28	163	Sri Lanka	1	15
Japan	72	237	Taiwan	54	107
Netherlands	36	243	Thailand	4	37
New Zealand	10	40	Total	287	1802
Norway	19	54			
Portugal	1	36			
Singapore	23	114			
Spain	33	219			
Sweden	81	287			
Switzerland	37	112			
United Kingdom	413	1378			
Total	1280	5784			

**Table 2: Descriptive Statistics for VC backed Companies Funded between 1996 and 2002 that ‘Exited’ by Beginning of 2007**

IPOs/Acquisitions are classified as ‘Successful’ Exits; companies that did not exit successfully are denoted ‘Unsuccessful’ Exits. The table presents statistics on VC backed portfolio companies that were initially funded between 1996 and 2002, and for which relevant data are available. In columns 6, 7 and 8, statistics for developed economies as classified in Table 1 are reported. In columns 9, 10 and 11 statistics for emerging economies as classified in Table 1 are reported. P-values pertaining to a t-test for equality of means are reported in columns 5, 8 and 11. Variables are defined in the Appendix.

	Overall Sample				Test of Equality (p-values)	Developed Economies		Test of Equality (p-values)	Emerging Economies		Test of Equality (p-values)
	Successful Exits		Unsuccessful Exits			Successful Exits	Unsuccessful Exits		Successful Exits	Unsuccessful Exits	
	N	Mean	N	Mean		Mean	Mean		Mean	Mean	
<b><i>Legal Rights and Protections</i></b>											
Legal Index	1565	2.00	7555	1.90	0.00	2.05	1.97	0.00	1.73	1.68	0.00
<b><i>Country Stock Market Development</i></b>											
Stock Market Development	1567	9.32	7586	8.29	0.00	10.27	9.62	0.00	5.09	3.99	0.00
<b><i>Country Culture</i></b>											
Hofstede Cultural Distance	1567	4.42	7586	3.29	0.00	4.10	3.40	0.00	5.85	2.93	0.00
<b><i>VC Experience</i></b>											
Lead VC Age (years)	1496	13.77	7299	11.37	0.00	14.81	12.50	0.00	9.00	7.69	0.02
% of Companies backed by a US VC	1567	26.74	7586	17.41	0.00	26.95	18.55	0.00	25.78	13.76	0.00
<b><i>Local Investor Participation (LOF)</i></b>											
% of Companies having a US VC firm and a local VC in the VC syndicate	1567	14.17	7586	7.72	0.00	15.63	9.02	0.00	7.67	3.55	0.00
<b><i>VC Syndication</i></b>											
VC Syndicate Size	1567	4.28	7586	3.36	0.00	4.65	3.78	0.00	2.63	2.04	0.00
<b><i>Other Control Variables</i></b>											
Stock Market Conditions (% Return on MSCI Country Index)	1567	5.94	7586	5.26	0.00	5.36	4.26	0.00	8.53	8.46	0.91
GDP (\$ Billion)	1567	1025.32	7586	947.89	0.00	1168.27	1108.48	0.04	387.75	432.44	0.00
Country Openness (%)	1567	66.50	7586	69.67	0.01	66.42	71.61	0.00	66.83	63.47	0.15
% of Companies in which first VC investment occurred at seed/early stage	1567	31.78	7586	43.17	0.00	30.86	42.05	0.00	35.89	46.78	0.00

**Table 3: Correlation of Variables**

This table reports the pair-wise correlations among the explanatory variables. ‡, †, and \* indicate statistical significance at the 1, 5, and 10% levels respectively. Variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Legal Index	1.00										
(2) Stock Market Development	0.60‡	1.00									
(3) Hofstede Cultural Distance	-0.04‡	-0.04‡	1.00								
(4) Lead VC Age	0.15‡	0.02*	0.21‡	1.00							
(5) Dummy=1 if VC Syndicate has a US VC Firm	0.06‡	-0.03‡	0.48‡	0.07‡	1.00						
(6) VC syndicate size	0.11‡	-0.06‡	0.11‡	0.16‡	0.33‡	1.00					
(7) Dummy=1 if the VC syndicate has a US VC and a local VC	0.06‡	-0.01	0.14‡	0.05‡	0.64‡	0.45‡	1.00				
(8) Stock Market Conditions	-0.17‡	-0.08‡	-0.04‡	-0.06‡	-0.05‡	-0.01	0.01†	1.00			
(9) GDP (\$ Billion)	0.12‡	-0.10‡	0.10‡	0.11‡	0.01	-0.00	-0.01	-0.10‡	1.00		
(10) Country Openness	-0.01	0.38‡	0.12‡	0.00	-0.01	-0.01	-0.01	-0.02	-0.46‡	1.00	
(11) Dummy=1 if first VC investment occurred at company's seed/early stage	-0.06‡	0.01	-0.06‡	-0.09‡	-0.04	0.15‡	0.12‡	0.01	-0.06‡	0.03†	1.00



**Table 4: Hazard Analysis of the Status of VC-backed Portfolio Companies in the Beginning of Year 2007**

The sample in the regressions consists of VC backed portfolio companies funded between 1996 and 2002, and that received their first round of VC funding beginning in 1996, and for which relevant data are available. The Cox Hazard Model is estimated with log of time to exit being the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Explanatory variables are explained in Appendix A. Intercepts and industry dummies are not reported. P-values, adjusted for country level clustering, are in parentheses below the coefficient estimates. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	(1)	(2)	(3)
Legal Index	0.692*** (0.00)	0.693*** (0.00)	0.620*** (0.00)
Stock Market Development	0.010*** (0.00)	0.010*** (0.00)	0.012*** (0.00)
Hofstede Cultural Distance	0.014*** (0.01)	0.018*** (0.00)	0.016*** (0.00)
Dummy=1 if a US VC firm invested in the portfolio company	0.168** (0.02)	-0.001 (1.00)	0.012 (0.92)
Dummy=1 if the VC syndicate contains a US firm and a local VC firm		0.339** (0.02)	0.357*** (0.01)
Lead VC Age			0.004* (0.06)
Log of VC Syndicate Size	0.173*** (0.00)	0.139*** (0.00)	0.123*** (0.00)
Stock Market Conditions	2.821*** (0.00)	2.796*** (0.00)	2.721*** (0.01)
Log GDP	0.038 (0.47)	0.042 (0.41)	0.043 (0.44)
Country Openness	-0.138 (0.12)	-0.142 (0.11)	-0.153* (0.09)
Dummy =1 if first VC investment occurred at Company's Seed/Early stage	-0.462*** (0.00)	-0.470*** (0.00)	-0.480*** (0.00)
-Log Likelihood	13547.46	13542.83	12875.63
Number of Successful VC Exits	1557	1557	1486
No. of Portfolio Companies	9112	9112	8755

**Table 5: Hazard Analysis of the Status of VC-backed Portfolio Companies in the Beginning of Year 2007 (Including Interactions)**

The sample in the regressions consists of VC backed portfolio companies based in both developed and emerging economies, funded between 1996 and 2002, received their first round of VC funding beginning in 1996, and for which relevant data are available. The Cox Hazard Model is estimated with log of time to exit being the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Explanatory variables are explained in Appendix A. Intercepts and industry dummies are not reported. P-values, adjusted for country level clustering, are in parentheses below the coefficient estimates. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	(1)	(2)	(3)
Legal Index	0.683*** (0.00)	0.690*** (0.00)	0.619*** (0.00)
Stock Market Development	0.009*** (0.01)	0.009*** (0.01)	0.011*** (0.00)
Hofstede Cultural Distance	0.008** (0.05)	0.012*** (0.00)	0.009*** (0.01)
Hofstede Cultural Distance*Emerging Economy Indicator	0.031*** (0.00)	0.036*** (0.00)	0.037*** (0.00)
Dummy=1 if a US VC firm invested in the portfolio company	0.133 (0.11)	-0.076 (0.59)	-0.065 (0.65)
Dummy=1 if the VC syndicate contains a US VC firm and a local VC firm		0.422*** (0.01)	0.433*** (0.01)
Dummy=1 if the VC syndicate contains a US VC firm and a local VC firm * Emerging Economy Indicator		-0.326** (0.05)	-0.250 (0.15)
Emerging Economy Indicator	-0.196 (0.33)	-0.181 (0.36)	-0.197 (0.35)
Lead VC Age			0.003** (0.05)
Log of VC Syndicate Size	0.171*** (0.00)	0.134*** (0.00)	0.119*** (0.00)
Stock Market Conditions	2.895*** (0.00)	2.886*** (0.00)	2.823*** (0.00)
Log GDP	0.042 (0.36)	0.049 (0.29)	0.050 (0.31)
Country Openness	-0.119 (0.16)	-0.124 (0.14)	-0.132 (0.13)
Dummy =1 if first VC investment occurred at company's Seed/Early stage	-0.457*** (0.00)	-0.464*** (0.00)	-0.475*** (0.00)
-Log Likelihood	13541.01	13534.66	12867.53
Number of Successful VC Exits	1557	1557	1486
No. of Portfolio Companies	9112	9112	8755

**Table 6: Hazard Analysis of the Status of VC-backed Portfolio Companies based in Developed and Emerging Economies in the Beginning of Year 2007**

The sample in the regressions consists of VC backed portfolio companies based in developed and emerging economies, funded between 1996 and 2002, received their first round of VC funding beginning in 1996, and for which relevant data are available. The Cox Hazard Model is estimated with log of time to exit being the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Explanatory variables are explained in Appendix A. Intercepts and industry dummies are not reported. P-values, adjusted for country level clustering, are in parentheses below the coefficient estimates. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	Developed Economies		Emerging Economies	
	(1)	(2)	(3)	(4)
Legal Index	0.564*** (0.00)	0.481*** (0.00)	1.224*** (0.01)	1.311*** (0.00)
Stock Market Development	0.010*** (0.00)	0.012*** (0.00)	0.092*** (0.00)	0.094*** (0.00)
Hofstede Cultural Distance	0.010*** (0.00)	0.008** (0.04)	0.052*** (0.00)	0.051*** (0.00)
Dummy=1 if a US VC firm invested in the portfolio company	0.009 (0.95)	0.016 (0.92)	-0.415*** (0.00)	-0.354** (0.03)
Dummy=1 if the VC syndicate contains A US firm and a local VC firm	0.396** (0.02)	0.400** (0.02)	0.105 (0.53)	0.200 (0.19)
Lead VC Age		0.004*** (0.01)		0.003 (0.83)
Log of VC Syndicate Size	0.116*** (0.00)	0.105*** (0.00)	0.289*** (0.00)	0.236*** (0.00)
Stock Market Conditions	3.416*** (0.00)	3.245*** (0.00)	2.200 (0.37)	2.413 (0.36)
Log GDP	0.068* (0.09)	0.066 (0.13)	-0.332 (0.18)	-0.269 (0.22)
Country Openness	-0.175*** (0.00)	-0.199*** (0.00)	-0.704*** (0.00)	-0.643*** (0.00)
Dummy =1 if first VC investment occurred at Company's Seed/Early stage	-0.472*** (0.00)	-0.485*** (0.00)	-0.376*** (0.00)	-0.387*** (0.00)
-Log Likelihood	10778.69	10306.29	1988.25	1838.55
Number of Successful VC Exits	1276	1224	281	262
No. of Portfolio Companies	7060	6817	2052	1938

**Table 7: Cultural Distance, Due-diligence, and Hazard Analysis of the Status of VC-backed Portfolio Companies in the beginning of Year 2007**

The sample in the regressions consists of VC backed portfolio companies based in emerging economies, funded between 1996 and 2002, received their first round of VC funding beginning in 1996, and for which relevant data are available. A two-stage regression framework is adopted. The first stage is an OLS regression used to create a fitted value for VC experience using the Hofstede cultural distance as the regressor. In the second stage the Cox Hazard Model is estimated with log of time to exit being the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Explanatory variables are explained in Appendix A. Intercepts and industry dummies are not reported. P-values, adjusted for country level clustering, are in parentheses below the coefficient estimates. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	Lead VC age (first stage)	(1)	(2)	(3)	(4)
Hofstede Cultural Distance	0.451*** (0.00)				
Legal Index		0.618*** (0.00)	0.611*** (0.00)	0.620*** (0.00)	0.618*** (0.00)
Stock Market Development		0.012*** (0.00)	0.010*** (0.00)	0.012*** (0.00)	0.012*** (0.00)
Lead VC Age ( <i>Fitted Value from 1<sup>st</sup> Stage</i> )		0.031*** (0.01)	0.016* (0.08)	0.039*** (0.00)	0.024*** (0.00)
Lead VC Age ( <i>Fitted Value from 1<sup>st</sup> Stage</i> ) * Emerging Economy Indicator			0.072*** (0.00)		0.077*** (0.00)
Lead VC Age ( <i>Residual from 1<sup>st</sup> Stage</i> )		0.004** (0.05)	0.004** (0.04)	0.004* (0.06)	0.003* (0.06)
Dummy=1 if a US VC firm invested in the portfolio company		0.186** (0.02)	0.147* (0.09)	0.012 (0.92)	-0.050 (0.72)
Dummy=1 if the VC syndicate contains a US VC firm and a local VC firm				0.357*** (0.01)	0.393*** (0.01)
Emerging Economy Indicator			-0.940*** (0.01)		-0.996*** (0.01)
Log of VC Syndicate Size		0.158*** (0.00)	0.157*** (0.00)	0.123*** (0.00)	0.120*** (0.00)
Stock Market Conditions		2.753*** (0.01)	2.846*** (0.00)	2.722*** (0.01)	2.807*** (0.00)
Log GDP		0.039 (0.49)	0.044 (0.37)	0.043 (0.44)	0.050 (0.32)
Country Openness		-0.148* (0.10)	-0.126 (0.15)	-0.153* (0.09)	-0.128 (0.14)
Dummy =1 if first VC investment occurred at company's Seed/Early stage		-0.474*** (0.00)	-0.469*** (0.00)	-0.480*** (0.00)	-0.476*** (0.00)
R <sup>2</sup> / -Log Likelihood	4%	12880.36	12873.66	12875.63	12868.02
Number of Successful VC Exits		1486	1486	1486	1486
No. of Portfolio Companies	8795	8755	8755	8755	8755

**Table 8: Individual Cultural Differences and Hazard Analysis of the Status of VC-backed Portfolio Companies in the Beginning of Year 2007**

The sample in the regressions consists of VC backed portfolio companies funded between 1996 and 2002, received their first round of VC funding beginning in 1996, and for which relevant data are available. The Cox Hazard Model is estimated with log of time to exit being the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Explanatory variables are explained in Appendix A. Intercepts and industry dummies are not reported. P-values, adjusted for country level clustering, are in parentheses below the coefficient estimates. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	(1)	(2)	(3)	(4)
Legal Index	0.603*** (0.00)	0.632*** (0.00)	0.605*** (0.00)	0.562*** (0.00)
Stock Market Development	0.011*** (0.00)	0.011*** (0.00)	0.011*** (0.00)	0.012*** (0.00)
Power Distance	0.005* (0.10)			
Individualism Distance		0.006*** (0.00)		
Uncertainty Avoidance Distance			0.003* (0.10)	
Masculinity Distance				0.005*** (0.01)
Dummy=1 if a US VC firm invested in the portfolio company	0.104 (0.46)	0.006 (0.96)	0.109 (0.37)	0.117 (0.38)
Dummy=1 if the VC syndicate contains a US VC firm and a local VC firm	0.295** (0.04)	0.358*** (0.01)	0.297** (0.02)	0.294** (0.04)
Lead VC Age	0.004*** (0.01)	0.004** (0.03)	0.004*** (0.01)	0.004*** (0.01)
Log of VC Syndicate Size	0.121*** (0.00)	0.129*** (0.00)	0.122*** (0.00)	0.122*** (0.00)
Stock Market Conditions	2.710*** (0.01)	2.703*** (0.01)	2.727*** (0.01)	2.728*** (0.01)
Log GDP	0.045 (0.42)	0.043 (0.44)	0.034 (0.54)	0.045 (0.40)
Country Openness	-0.135 (0.12)	-0.149 (0.11)	-0.135 (0.12)	-0.132 (0.11)
Dummy =1 if first VC investment occurred at company's Seed/Early stage	-0.484*** (0.00)	-0.483*** (0.00)	-0.484*** (0.00)	-0.487*** (0.00)
-Log Likelihood	12879.54	12876.73	12879.89	12878.95
Number of Successful VC Exits	1486	1486	1486	1486
No. of Portfolio Companies	8755	8755	8755	8755

**Table 9: Hazard Analysis of the Status of VC backed Portfolio Companies in the Beginning of Year 2007 controlling for Endogeneity from Experienced VC Funding**

The sample in the regressions consists of VC backed portfolio companies funded between 1996 and 2002, received their first round of VC funding beginning in 1996, and for which relevant data are available. The Cox Hazard Model is estimated with log of time to exit as the dependent variable. The time to exit of a successful portfolio company that has either gone public or been acquired is the calendar time taken to exit from the date of its initial VC funding. Time to exit of portfolio companies yet to exit successfully by beginning of 2007 is right censored at the end of calendar year 2006. Positive (negative) coefficient indicates that the covariate increases the hazard and shortens (lengthens) the expected duration. Independent variables are described in Appendix A. Intercepts and industry dummies are not reported. P-values adjusted for country level clustering are in parentheses below the coefficient estimates. Additional explanatory variables used in the estimation of selection equation (probit model) predicting experienced VC investments (lead VCs residing in the top quartile based on their age in a given year) are total VC funding (\$M) received by the portfolio company across all funding rounds and dummy variables for the three countries (US, UK, and South Korea) whose lead VC firms comprise at least 10% of VC investments in our sample. \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Model	Pr (Experienced VC=1)	Hazard of VC Success	Pr (Experienced VC=1)	Hazard of VC Success
Total VC Funding to the Portfolio Company	0.001*** (0.00)		0.001*** (0.00)	
Legal Index	-0.349*** (0.00)	0.521** (0.02)	-0.264*** (0.00)	0.528** (0.02)
Stock Market Development	0.001 (0.60)	0.016*** (0.00)	-0.001 (0.72)	0.016*** (0.00)
Hofstede Cultural Distance		0.013** (0.02)	0.013*** (0.00)	0.011** (0.05)
Dummy=1 if a US VC firm invested in the portfolio company		0.001 (0.99)		0.014 (0.92)
Dummy=1 if the VC syndicate contains a US VC firm and a local VC firm		0.355** (0.02)		0.351** (0.02)
Lead VC Age		0.004 (0.23)		0.004 (0.20)
Log of VC Syndicate Size		0.127*** (0.00)		0.127*** (0.00)
Stock Market Conditions		2.838*** (0.01)		2.761*** (0.01)
Log GDP	0.036** (0.05)	0.022 (0.74)	0.050*** (0.01)	0.021 (0.74)
Country Openness		-0.200** (0.03)		-0.200** (0.02)
Dummy =1 if first VC investment occurred at company's Seed/Early stage		-0.421*** (0.00)		-0.425*** (0.00)
Dummy=1 if Lead VC is from US	0.567*** (0.00)		0.429*** (0.00)	
Dummy=1 if Lead VC is from UK	0.966*** (0.00)		0.908*** (0.00)	
Dummy=1 if Lead VC is from South Korea	-0.088 (0.12)		-0.037 (0.52)	
Inverse Mills Ratio		-0.327*** (0.01)		-0.311** (0.03)
-Log Likelihood	4005.33	9744.97	3996.81	9745.30
Number of Successful VC Exits		1163		1163
No. of Portfolio Companies	6991	6674	6991	6674