



Institutions and the internationalization of US venture capital firms

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Abstract

In recent years, venture capital firms have increasingly turned to foreign countries in search of investment opportunities. The cross-border expansion of venture capital firms presents an interesting case of internationalization, because they are at variance with both conventional portfolio and direct investment models. Given the specific nature of venture capital investing, a new theoretical perspective is needed to understand foreign venture capital investments. This paper contributes to international business research by examining the features of the institutional environment that influence venture capital firms' foreign market entry decisions, and how their effect changes as firms acquire experience. We report results on 216 American venture capital firms potentially investing in 95 countries during the 1990–2002 period. We find that venture capital firms invest in host countries characterized by technological, legal, financial, and political institutions that create innovative opportunities, protect investors' rights, facilitate exit, and guarantee regulatory stability, respectively. We also find that as firms gain more international experience, they are more likely to overcome constraints related to these institutions.

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INTRODUCTION

The theory of foreign direct investment seeks to explain various aspects associated with the control exercised by a firm over the production of a good or service in at least one location other than its home country. As originally proposed by Hymer (1976) in the late 1950s, the difference between direct and portfolio investment lies precisely in the intention of the firm to exercise managerial control over the foreign operation. In recent years, venture capital firms have increasingly turned to foreign countries in search of investment opportunities. The cross-border expansion of venture capital firms presents an interesting case of internationalization, because their foreign investments cannot be classified in a straightforward manner. In some respects, venture capital foreign investments appear to share some features of those characterized in the literature as portfolio investments. First, the venture capital firm is a financial intermediary operating between the ultimate investor and the entrepreneur. Second, the venture capital firm's ultimate goal is not to produce a good or a service for profit, but to

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obtain a capital gain with which to reward the ultimate investor. Third, although the venture capital firm may dispatch one or more directors to the board, the managerial hierarchy of the foreign venture does not functionally report to the venture capital firm. Moreover, venture capital firms typically invest as part of a syndicate, and rarely are majority investors.

Venture capital firms, however, behave as much more than pure financial intermediaries, given that they also provide the venture with organizational, managerial, industry, and even technological expertise. Moreover, they exert much more frequent and extensive control over the invested company than the typical portfolio investor (Gompers & Lerner, 2000). Venture capital firms make capital investments in "opportunities" that typically entail high risk, and a potential for high returns. These opportunities are not single resources or means of production, but individual companies that constitute a unique "bundle of resources" (Penrose, 1959). Given the specific nature of venture capital investing, one that is at variance with both conventional portfolio and direct investment models, a new theoretical perspective is needed to understand foreign venture capital investments.

Though still small, cross-border venture capital activity has risen quickly since the early 1990s.

VCs who once bragged about never driving more than half an hour to visit a portfolio company are jetting to Australia for optical engineers, Israel for security whizzes, India and Kazakhstan for brute software coding, South Korea for online gaming, and Japan for graphics chips. For growth across the board, China is the place to go.¹

According to one venture capitalist, "VCs in Silicon Valley used to pride themselves on being local ... That was well and good when the US was the mecca for technology."² In many countries around the world, local practices and regulations are being overhauled so as to make it easier for foreign venture capital firms to operate. For instance, a Chinese legislator and economic expert argued in an interview that "venture capital is not conflicted with Socialism."³ Understanding the cross-border activities of venture capital firms is of increasing relevance as the world economy shifts toward knowledge-intensive activities. The venture capital industry has played an important role in spurring innovation and entrepreneurship in the US. In recent years, US venture capital firms started to look abroad for investment opportunities in other countries. This trend is important not only in

providing new opportunities for venture capital firms, but also in contributing to the development of local economies through entrepreneurship and innovation.

In this paper we analyze the distinctive aspects of foreign venture capital investing by examining the reasons why venture capital firms decide to invest in some foreign locations but not in others. We adopt an institutional perspective focused on the characteristics of countries that make them more attractive for US venture capital investors. The conventional wisdom is that venture capital is an activity difficult or nearly impossible to organize effectively and successfully across borders. Participants in the industry emphasize the local nature of deal-making (Freeman, 2005). Research has documented that venture capitalists tend to fund ventures located relatively close to their domicile so as to facilitate monitoring and control (Sorenson & Stuart, 2001). Therefore it becomes relevant to study what institutions might help these organizations overcome the difficulties of doing business in foreign environments.

We also examine changes in the choice of foreign market as the venture capital firm gains international experience. Research has demonstrated that firms adjust their foreign direct investment decisions as they accumulate knowledge about foreign markets (e.g., Barkema, Bell, & Pennings, 1996; Chang, 1995; Delios & Henisz, 2003; Guillén, 2002). Firms are heterogeneous in their perception of institutional constraints and opportunities in foreign markets, and in their ability to cope with them. We therefore examine whether and how venture capital firms' international experience moderates the impact of country institutions on the choice of foreign markets to enter.

By examining the foreign location choices of venture capital firms, we strive to contribute to the international business literature by offering a systematic examination of the importance of host-country institutions on foreign market choice of venture capital firms through a large-sample study. We argue that the decision of venture capital firms to invest in companies located in foreign markets is driven by institutions that foster the availability of innovative and entrepreneurial opportunities, the ability to commercialize these opportunities, and the extent to which the institutional infrastructure of each country enables the appropriation of returns. We also argue that firms' international experience moderates the effects of institutions.



THE VENTURE CAPITAL INDUSTRY IN THE US AND AROUND THE WORLD

The venture capital firm is a genuinely American institution. In 1946 a group of Boston academics and financiers created American Research and Development. A key innovation came about in 1958, when one firm organized itself as a limited partnership, in which limited partners or investors provided funds to general partners or venture capitalists to invest in entrepreneurial ventures. This organizational form enabled the venture capitalist to be exempt from the prohibitions on owning more than 10% of the equity and serving on the board of directors of portfolio companies. The limited partnership became the dominant form of incorporation in the US. Nowadays the typical venture capital firm has anywhere between two and over 30 general partners. The amount of capital under management can range from 10 million to several billion dollars (Fenn, Liang, & Prowse, 1997).

The venture capital industry has been one of the major driving forces behind innovative activity and growth of high-technology industries in the US economy. Although venture capital outlays represented only 3% of total corporate investment between 1983 and 1992, they resulted in 8% of all US industrial innovations (Kortum & Lerner, 2000). As a result, venture capital has been a significant driver of the US economy through spurring entrepreneurial activity. As of 2005, venture-capital-backed companies represented 9% of total US private sector employment and 16.6% of GDP (Venture Impact, 2007).

The success of the US venture capital industry in financing innovation and contributing to growth has encouraged venture capital activity in other countries. Although private equity and venture capital investment around the world are comparatively smaller, many countries report large growth rates. For instance, during 2005 private equity investments grew by 45% in India, and 328% in China (Global Private Equity, 2006). The early experiments with venture capital in countries such as Germany and Japan failed, in spite of government or corporate backing (Becker & Hellmann, 2005; Kenney, Han, & Tanaka, 2002). Later developments gave rise to venture capital activities that differed in structure and operation from their US counterparts, always in response to unique institutional demands (Bottazzi, Da Rin, & Hellmann, 2004). Some of the factors found to affect the growth of venture capital activity include

appropriate structures and government policies to protect investor returns (Becker & Hellmann, 2005; Jeng & Wells, 2000), the level of economic development, the availability of exit options (Black & Gilson, 1998; Kenney et al., 2002), and the quality of the national system of innovation and levels of entrepreneurship (Becker & Hellmann, 2005).⁴ A recent study of domestic investment decisions in three countries shows that venture capitalists in rule-based economies base their decisions more on market characteristics, while those in relationship-based economies rely more on characteristics of the human capital (Zacharakis, McMullen, & Shepherd, 2007). However, very little research has examined the internationalization decisions of venture capital firms, or the patterns of cross-border investment (see Wright, Pruthi, & Lockett, 2005, for a review).

INSTITUTIONS AND FOREIGN MARKET ENTRY BY VENTURE CAPITAL FIRMS

Venture capital firms depend on a number of institutions in order to operate, including technological institutions providing for entrepreneurial opportunities, legal institutions facilitating contracts between the firm and the entrepreneur, financial institutions making it possible to exit the investment, and political institutions preventing any harm to or curtailment of their property rights. Our main goal is to examine which of these institutions increase the attractiveness of countries for venture capital firms located in the US, and the extent to which the effects of institutions are moderated by firms' international experience.

In examining the effect of host-country institutions on venture capital investment, we define institutions as "multifaceted, durable social structures, made up of symbolic elements, social activities, and material resources" that "provide guidelines and resources for acting as well as prohibitions and constraints on action" (Scott, 2001: 49–50). Several areas of recent institutional theory and research are relevant to the analysis of the host-country institutions that venture capital firms find attractive. First, institutions that support innovation and technology are important to venture capital firms because such firms tend to focus their attention on high-tech industries. The literature on national systems of innovation offers an institutional framework for the comparative analysis of the characteristics, organization and performance of countries in the area of technology. This line of research draws on institutional analysis

in economics, political science, sociology and/or organizational studies (Furman, Porter, & Stern, 2002; Nelson & Rosenberg, 1993; Patel & Pavitt, 1994; Porter, 1990; Whitley, 1992). Second, the rapidly growing literature on cross-national patterns of corporate governance and finance provides a framework for understanding the complex relationship between legal systems, financial markets, and capitalist development in general, and the legal protection of investors' rights in particular (Guillén, 2000; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998), another issue that is of central concern to venture capital firms. Third, the literature on political hazards uses institutional economics and positive political theory to study the conditions that make for a stable political environment (Henisz, 2000a,b; Henisz & Williamson, 1999). This aspect is of cardinal importance to venture capital firms, given that they need to ensure that the investment returns will not be expropriated. Based on these theoretical perspectives, let us turn to examining how technological, legal, financial, and political institutions affect foreign location choice by venture capital firms.

Institutions Supporting Knowledge and Technology: National Systems of Innovation

The literature on national systems of innovation has conceptualized and documented that countries, and regions within countries, differ in terms of the inputs allocated to the creation of knowledge, technology and innovation, the quality of the institutions that help transform those inputs, and the resulting level of performance (Almeida & Kogut, 1999; Furman et al., 2002; Kogut & Zander, 1993; Nelson & Rosenberg, 1993; Patel & Pavitt, 1994; Porter, 1990; Romer, 1990). Although science and technology have become more global in nature over the last two decades, the country continues to be a relevant unit of analysis. Globalization has not erased differences in effort or outcomes across countries, resulting in persistent knowledge and technological gaps, for two reasons. First, many of the institutional actors involved in the effort (i.e., governments, universities, trade associations) are distinctively national or subnational in character (Nelson & Rosenberg, 1993). And second, knowledge and technology move more easily within than across national borders, as a large body of empirical research has established (Guillén, 1994; Kogut & Chang, 1991; Patel & Pavitt, 1994).

Differences in national levels of innovation are likely to influence the level of entrepreneurial activity and, as a result, the attractiveness of the country to foreign venture capital investors. Entrepreneurs and firms tend to agglomerate in locations with high levels of institutional support for innovation. For instance, prior work documents that new ventures benefit from access to resources such as human capital, and from knowledge spillovers by locating close to universities and other firms (Audretsch, Lehman, & Warning, 2005; Hall, Link, & Scott, 2003; Stuart & Sorenson, 2003a). In particular, geographic proximity facilitates spillovers, as inventors in universities and firms become more aware of each other's work, and develop new knowledge through more frequent face-to-face interaction (Adams & Jaffe, 1996; Jaffe, Tratjenberg, & Henderson, 1993). Research shows that smaller and younger firms, that is, those that tend to be funded by venture capital, stand to benefit the most from spillovers from local sources of knowledge (Alcacer & Chung, 2007). As a result, we expect venture capital firms as well as entrepreneurs to locate in regions and countries characterized by high innovative activity (Powell, Koput, Bowie, & Smith-Doerr, 2002). While prior work has examined the regional agglomeration of entrepreneurs and venture capital firms (Florida & Kenney, 1988; Kenney et al., 2002; Stuart & Sorenson, 2003a), the impact of national systems of innovation on venture capital foreign investment has not been addressed in the literature.

We argue that national systems of innovation influence the extent of profit-making opportunities and entrepreneurial activity in each market. New ventures choose among markets based on the existence of institutions that support innovation and technological development (e.g., Audretsch et al., 2005; Hall et al., 2003; Stuart & Sorenson, 2003a). In turn, venture capital firms scan the environment for attractive opportunities, that is, new innovative ideas in which to invest, and often find them in areas that have to do with the application of new knowledge or technology (Gompers & Lerner, 2000, 2001). Countries with vibrant institutions that support research and innovation are likely to become more attractive for venture capital firms looking to expand internationally. Hence we predict:

Hypothesis 1: The rate of entry into a foreign market by venture capital firms increases with the local level of knowledge and technology.

Institutions Supporting Venture Capital Transactions

Venture capital involves a considerable “leap of faith,” given the nature of young entrepreneurial ventures and the uncertainties about their success (Gompers & Lerner, 2001: 87). Hence the venture capital firm uses certain monitoring and enforcement mechanisms to ensure that those running the invested company do so in a way consistent with the interests of the investors, who tend to have a preference for an exit within a number of years through an initial public offering (IPO). This chain of events is possible only in the presence of appropriate legal, financial and political institutions. The most important legal institution is corporate law, which specifies the rights and obligations of owners and managers. The existence of large and active equity markets is required in order to materialize the venture capitalist’s preferred exit option, namely, the IPO. Finally, political institutions need to provide a dose of stability and predictability so as to placate investors’ fears about future changes in rules and regulations. Let us analyze each of these in turn.

Legal institutions: corporate law. Laws fulfill two roles that facilitate economic activity and financial transactions. First, they define legal persons that transcend individuals, create negotiable instruments, and establish how negotiations and transactions can take place (Trevino, 1996). Second, the legal order defines and protects the legitimate interests of the various parties. Weber (1978: 328–329) observed that although “in most business transactions it never occurs to anyone even to think of taking legal action, ... economic exchange is quite overwhelmingly guaranteed by the threat of legal coercion.” Firms and investors prefer to operate in a context in which legal institutions enable and protect them (Trevino, 1996).

Legal institutions are relevant to the growth of venture capital activity. Recent research on the contractual relationship between the entrepreneur and the venture capitalist highlights that the latter seeks to diversify its holdings by investing small amounts in each venture. This allows the venture capitalist to delegate control to the entrepreneur during the normal course of operations, but to reassert its rights as owner if things take a turn for the worse (Lerner & Schoar, 2005). The contractual arrangements typically used in venture capital deals were first developed in the US (Gompers & Lerner, 2000, 2001; Sahlman, 1990). The US, however,

provides a legal environment for venture capital activity that is not present in every country around the world. Thus the transfer of the contractual arrangements to other countries may prove problematic (Bottazzi, Da Rin, & Hellmann, 2008; Kaplan, Martel, & Stromberg, 2007; Lerner & Schoar, 2005).

Comparative legal scholarship (Glendon, Gordon, & Osakwe, 1994; Reynolds & Flores, 1989) and more recent economic analyses (La Porta et al., 1998; La Porta, Lopez-de-Silanes, & Shleifer, 1999) have documented that owners’ interests receive different degrees of legal definition and protection depending on the legal system. This line of research argues that owners’ or investors’ rights are defined and protected in varying ways and to different degrees depending on the legal tradition that provides the foundation for corporate law. The two broad legal traditions that influence corporate law and investor protection are the English common law tradition and the civil law tradition (La Porta et al., 1998). The English common law tradition, adopted by countries including the US, is shaped by the decisions of judges ruling on specific issues more than other legal traditions. As Weber (1978: 890) put it, “English legal thought is essentially an empirical art.” By contrast, the civil law tradition encompasses French, German, and Scandinavian families, and “uses statutes and comprehensive codes as a primary means of ordering legal material” (La Porta et al., 1998: 118).

English, French, and German corporate laws diffused widely throughout the world following patterns of imperial, military, economic, or cultural influence. The former British colonies – including the US, Canada, Australia, Ireland, Singapore, and many others in Africa and South Asia – adopted English common law. French law spread not only to the francophone colonies in the Middle East, Africa, Indo-China, Oceania, and the Caribbean but also to the Netherlands, Portugal, Spain, Italy, and their respective colonies. The German legal tradition shaped corporate laws in Austria, Switzerland, Greece, Hungary, the Balkans, Japan, Korea, Taiwan, and China, among other countries. Lastly, the former socialist countries constitute a separate category because their legal systems, though in many cases influenced by either French or German law, have been in flux since 1989 and have largely failed to provide a sound basis for effective corporate governance (Schneper & Guillen, 2004; Spicer, McDermott, & Kogut, 2000).

Comparative analyses of corporate legal traditions reveal that the English common law tradition

tends to provide stronger protection of investors' rights than the civil law tradition against potential agency problems with management (La Porta et al., 1998). La Porta and his colleagues (1998) compared countries along the legal rules pertaining to the rights of investors, and found that countries that have adopted the English common law tradition provided significantly better voting rights for shareholders as well as more legal rules that protected minority shareholders. The underlying reasons for different levels of investor protection between the two legal traditions were argued to be in the historical origins of each tradition. Specifically, French civil law was developed after the French Revolution and emphasized state power over property rights, whereas common law developed as a response to the needs of aristocrats and merchants (La Porta, Lopez-de-Silanes, & Shleifer, 2008). Research has also demonstrated that enforcement of owner protections and dispute-resolution time differs greatly across countries, and that there were significant differences in enforcement and dispute-resolution time between English common-law countries and others (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2003). These differences were attributed to the flexibility of decision-making under common law, as courts rely on broader standards rather than specific rules (La Porta et al., 1998).

Based on this evidence and analysis, we argue that venture capitalists prefer to operate in countries with a legal system that protects the rights of the investor. In the case of venture capital firms, the reasons for this preference are twofold. First, in countries with poor investor protection against agency risk, investors tend to protect themselves by increasing their ownership concentration, and exerting more control over management (Jensen & Meckling, 1976; La Porta et al., 1998; Shleifer & Vishny, 1986). The available cross-national micro evidence on venture capital contracts indicates that private equity investors in general, and venture capitalists in particular, respond to legal regimes offering poor protection by relying to a much greater extent on common stock and debt as opposed to convertible preferred stock (Bottazzi et al., 2008; Lerner & Schoar, 2005), by increasing the size of their stakes (Lerner & Schoar, 2005), and by maximizing their presence on the venture's board of directors (Lerner & Schoar, 2005). Taken together, this set of results parallels the finding that legal tradition affects patterns of corporate ownership in general (La Porta et al., 1999). In essence,

when investing in common-law countries, investors are generally more comfortable with lower levels of control, given that they can more easily achieve minority shareholder protection through contractual provisions such as convertible preferred equity, anti-dilution clauses, automatic conversion, and supermajority rules (Lerner & Schoar, 2005). It should be noted, however, that some empirical studies (e.g., Kaplan et al., 2007) found legal effects to disappear when venture capital firm-specific characteristics are taken into account. However, these studies do not examine whether venture capitalists systematically avoid funding otherwise attractive ventures just because they are located in a country with poor investor protection, examining instead the actual investments that have already taken place under each legal system. We argue that venture capital firms are likely to systematically prefer countries with an English common law tradition, because the need to increase equity stakes in countries with poor protection of investor rights constrains the ability of the venture capital firm to distribute capital among a larger number of ventures, and to diversify portfolio risk (Bottazzi et al., 2008; Lerner & Schoar, 2005).

The second reason for attractiveness of countries with better ownership protection has to do with entrepreneurs seeking capital. Entrepreneurs' appetite for venture capital funding may also be lower when investors' rights are not well protected, because of the additional equity stake demanded by the venture capitalist. Entrepreneurs with the best entrepreneurial opportunities may prefer to fund their ventures through alternative means, such as debt financing. As a result, venture capitalists' access to high-quality investment opportunities may be more limited in countries offering poor investor protection. Therefore we formulate:

Hypothesis 2: The rate of entry into a foreign market by venture capital firms increases to the extent that the local legal system protects investors' rights.

Financial institutions: equity markets. Financial markets are part of the institutional infrastructure enabling organizational founding and growth (e.g., Stuart & Sorenson, 2003b). The stock market is certainly important for venture capital firms. Venture capitalists do not indefinitely hold on to the equity in the entrepreneurial venture but rather seek to realize capital gains (and distribute them,

net of management fees, to the limited partners), typically through IPOs, which historically represent the majority of venture returns (Freeman, 2005; Gompers & Lerner, 2000). Hence the size and dynamism of the equity market in the country in which the venture is located promise better prospects for a successful exit, thus increasing the attractiveness of investments (Black & Gilson, 1998; Leachman, Kumar, & Orleck, 2002).⁵ As venture capitalists exit investments successfully, they can help investors recycle capital towards new opportunities and attract new funds (Black & Gilson, 1998). Thus a thriving local equity market helps attract, reallocate, and reward investors' capital.

Countries differ massively in terms of the size of their equity market. One useful and widely accepted indicator of equity market size is total stock market capitalization as a percentage of GDP (e.g., Kunt & Levine, 2004; La Porta et al., 2008; Rajan & Zingales, 2003). As of 2007, this measure ranged from as low as 15 in Poland, 26 in India, 27 in Brazil, 35 in Germany, 37 in China, 44 in Israel or 46 in South Korea, to 68 in France, 106 in the US and 119 in the United Kingdom, to name but a few examples (World Bank, 2008). Given the importance of the size of the local stock market for the attraction of capital to venture capital firms and for the realization of capital gains, we formulate:

Hypothesis 3: The rate of entry into a foreign market by venture capital firms increases with the size of the local stock exchange.

Political institutions: policy stability. Political institutions are a key determinant of the attractiveness of a location from the vantage point of an outsider. Firms benefit from the regular and predictable implementation of public policy (Guthrie, 1997; Trevino, 1996). The venture capital firm – like other types of firm – would generally prefer to invest in countries with low political hazards. The reason is that the existence of investment opportunities related to knowledge and technology, the presence of appropriate legal institutions protecting investors' rights, and the availability of financial channels to realize capital gains do not preclude the possibility that policymakers might be tempted to change laws, rules or regulations concerning those three aspects in order to appropriate investors' returns in full or in part. As institutional theorists argue, laws, rules and

regulations are seldom completely objective or unambiguous (Scott, 2001: 169–170). The extent to which laws, rules and regulations can potentially be changed or reinterpreted creates uncertainty for the regulated.

Henisz (2000a, b) proposes to conceptualize political hazards as a structural attribute of countries that may change over time. Countries differ in terms of the number of “political constraints.” As that number grows, so does “a government's ability to credibly commit not to interfere with private property rights,” an argument first advanced as relevant to the study of capital investment by North and Thomas (1973) (see also North, 1990). The constraints increase with the number of independent branches of government with veto power (executive, higher legislature, lower legislature, judiciary, local administration), and the degree to which veto points are controlled by different parties (i.e., when the various branches of government are not aligned). Firms, including venture capital firms, should anticipate little change in relevant regulations or property rights protections, or in their interpretation, to the extent that policymaking is subject to institutional constraints, thus providing for a more stable political environment for investment. Empirical evidence confirms that firms prefer to do business in countries in which rules and regulations concerning property rights are not likely to change as a result of unilateral actions on the part of the government. For instance, research has found that policy stability exerts a significant influence on long-term capital investments (e.g., Henisz, 2002), investor participation in infrastructure projects (Henisz, 2002; Henisz & Zelner, 2001), plant location decisions (Henisz & Delios, 2001), and the sequencing and mode of cross-border investments (e.g., Guillén, 2003). Thus we formulate:

Hypothesis 4: The rate of entry into a foreign market by venture capital firms increases with the local level of policy stability.

Institutions and firm experience. In the preceding arguments we have assumed that firms are uniformly affected by the presence of certain institutions in the host market. However, firms are heterogeneous in their strategic approach to foreign market entry because of differences in their previous expansion experiences (e.g., Barkema et al., 1996; Chang, 1995; Delios & Henisz, 2003; Guillén, 2002). In general, prior experience leads to

learning in two ways. First, experience allows firms to perfect their capabilities through repetition. Second, experiential learning leads firms to adjust their strategies as they obtain new information and update their assessments and calculations (Zollo & Winter, 2002). Companies acquire knowledge from experience, record it in their memory, and update their strategies (Cyert & March, 1963; Levitt & March, 1988; March & Olsen, 1984). Thus past experience can change the firm's subsequent strategy as well as its attitudes towards risk-taking.

As firms accumulate international experience, they develop a capability for foreign market entry and for surmounting whatever obstacles and constraints exist in the different host countries. In other words, experience may enable firms to overcome the liability of foreignness if it leads to an upgrading of capabilities. The learning of a capability for market entry takes place in a variety of ways, including the development of standard operating procedures for entry that can be used in a wide variety of markets (Delios & Henisz, 2003; Guillén, 2002), or the more efficient use of the scarce managerial skills that are required to manage international operations (Kindleberger, 1969). For instance, by the 1980s the largest American multinational enterprises had developed internal departments charged with providing top management with ongoing analysis, assessment, and strategy formulation in the area of country risk (Kobrin, 1987). Our argument is that firms will be deterred from entering a foreign market with an idiosyncratic mix of institutions unless they develop a capability to assess the institutional peculiarities and arrange their operations in a way that surmounts them.

Prior work on the venture capital industry also documents the significance of firm experience for investment practices. For instance, Sorenson and Stuart (2001) argue that prior investment experience may increase the geographic reach of venture capital firms' subsequent investments, as experience reduces the costs of monitoring. Lerner (1994) finds that venture capital firms' investment experience influences their syndication practices. These studies, however, typically focus on venture capital firms' domestic investment experience, which improves firms' capabilities to evaluate, manage and monitor investments in the home country (e.g., Black & Gilson, 1998; Lerner, 1994; Sorenson & Stuart, 2001). In contrast, we argue that the decision to invest in new institutional environments is affected by the extent of venture capital

firms' international investment experience. International investment experience provides venture capital firms with skills to evaluate and monitor investment opportunities, write contracts, and lead investments toward successful liquidity events under different institutional constraints. In short, we expect prior international experience to help firms negotiate the idiosyncratic institutional conditions surrounding investments in foreign markets.

Hypothesis 5: The effects of the local level of knowledge and technology, investor legal protections, stock market size, and policy stability on the rate of foreign market entry will weaken as the venture capital firm's international experience increases.

RESEARCH SETTING, DATA, AND METHODS

We test the effects of institutions on the internationalization of US venture capital firms with systematic data on their foreign investment activities between 1990 and 2002. The US venture capital industry grew significantly during this period, in terms of both capital available for investment and the number and amount of actual investments. Activity in the US and abroad peaked in the year 2000, which lies within our period of observation. We compiled the venture capital investment data from the VentureXpert database provided by Venture Economics,⁶ which collects information through an annual survey of over 1000 private equity partnerships in the US. This database has been used extensively in venture capital research (Barry, Muscarella, Peavy, & Vetsuypens, 1990; Gompers & Lerner, 2000; Megginson & Weiss, 1991; Sahlman, 1990; Shane & Stuart, 2001). Although it tends to oversample investments in Californian companies, most of the concerns about VentureXpert's quality have to do with issues surrounding capital disbursed and valuations (Kaplan et al., 2007), which are not the focus of this paper.

Given that our analysis focuses on the foreign investments of venture capital firms, we observed the entire population of 1010 US-domiciled firms between 1990 and 2002. Each of these firms had a presence in the venture capital industry, although some of them also engaged in other forms of later-stage private equity.⁷ In order to capture causal relationships between the dependent variable and the independent variables, we used a one-year lag. We therefore empirically examined investments

over the 12-year period between 1991 and 2002. As of the end of 2002, 216 of the 1010 venture capital firms made 1714 rounds of investment in 920 ventures located in 40 different foreign countries. The largest investors were Warburg Pincus, Advent International Corporation, and Japan/America Ventures. We excluded from all analyses 17 investments in companies that had gone public before the US venture capital firm invested.

Estimation Method and Dependent Variable

We analyzed the rate of a venture capital firm entering a new country with a hazard rate model (Allison, 1995; Tuma & Hannan, 1984). The hazard function is

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{\Pr\{t \leq T < t + \Delta t | T \geq t\}}{\Delta t} \quad (1)$$

and specifies the instantaneous rate at which entry occurs at time t , given that the event has not yet occurred (Allison, 1995; Kalbfleisch & Prentice, 2002). We modeled the hazard rate of entering a new country with the piecewise exponential model as implemented in Stata (Sorensen, 1999). Piecewise exponential models are semi-parametric models, where the baseline hazard rate is allowed to vary in an unconstrained way at each predefined time period. The benefit of this approach is the ability to model the time dependence without the more restrictive assumptions of parametric models. In order to estimate the hazard rate in each time period, we divided the data into yearly spells (Hannan & Freeman, 1989), and treated the observations as censored unless an event (entry) occurred. The time-varying independent variables were updated in each spell. The models were estimated using maximum likelihood estimation as implemented in Stata. For each year j , the hazard for each i is assumed to have the form

$$\log h_i(t) = \alpha_j + \beta x_j \text{ for } a_{j-1} \leq t < a_j \quad (2)$$

Because there are multiple observations for each venture capital firm and country, observations in the sample may not be independent. We therefore calculated robust standard errors clustered on each country–firm pair (Rogers, 1993; Wooldridge, 2002). We also implemented alternative models by clustering on firms or countries only, and the results did not change.

We estimated our models using a sample of firm-country-year observations. Each US venture capital firm may choose to enter a foreign country during a

given year. The dependent variable (event) equals 1 if firm i entered country j during year t . After excluding US venture capital firms that never invested abroad in this period, we have complete data for 137,605 firm-country-year observations. Results including firms that never invested are qualitatively similar to those reported below. Our empirical analysis focuses on investment counts and not on the size of the investment, because one can observe the latter only if an investment actually takes place. Focusing on the amount invested would unavoidably introduce a selection bias into the analysis of the impact of institutions, as we would have to include in our analysis only actual entries, and we would not have been able to examine the impact of institutions on the likelihood of entry in the first place.

The 216 venture capital firms in the population were active for an average of 7 years between 1991 and 2002. We obtained reasonably complete background information on 95 countries (see Appendix for a list), although for some of them the independent variables were not available for each and every year. The final sample for analysis consists of 137,605 firm-country-year combinations.⁸

Independent Variables

We follow the existing literature in measuring host-country institutions supporting innovation and technology (hereafter referred to as technological institutions) with outcome measures of the level of innovative activity in each country (Furman et al., 2002; Guler, Guillén, & MacPherson, 2002; Kumaresan & Miyazaki, 1999; Niosi, 2002). We use two separate indicators to measure the level of innovative activity in country j : the number of US patents granted to establishments in country j during year $t-1$, and the number of scientific and technical articles authored by residents of country j during year $t-1$. Patents and articles are widely used empirical indicators of the performance of national systems of innovation (Furman et al., 2002; Guler et al., 2002; Kumaresan & Miyazaki, 1999; Niosi, 2002), although they do not capture the full extent of innovative activity (Nelson & Rosenberg, 1993). They are especially well suited to a study of the factors that attract US venture capital firms to foreign environments because they are the result of both the level of inputs and the productivity of the system. It is also important to note that the US Patent and Trademark Office and the Institute of Scientific Information are sources of information on knowledge, technology and innovation routinely

used by US venture capital firms. Our field interviews revealed that venture capitalists and industry experts use patents and scientific articles as indicators of innovative activity in foreign countries, or to legitimize their decisions. Either way, countries with greater counts of patents and articles will be more attractive to the venture capital firm. We obtained the patent data from the NBER database (Hall, Jaffe, & Trajtenberg, 2001), and the publication data directly from the Institute of Scientific Information's Science Citation Index (which includes journals in several languages).

While it is useful to measure the number of patents filed domestically rather than those filed in the US, we chose the latter measure for three reasons. First, data on local patent filings are not available for many of the countries included in our analysis; using them would bias our sample toward countries with a highly developed intellectual property protection regime. Second, differences in patent laws limit the comparability of such figures across countries (Maskus, 2000). Third, for US venture capital firms, patents filed in the US are likely to be a more relevant and visible indicator of innovative activity than patents filed elsewhere, since this information is more easily available and comparable across ventures. We normalized patents and publications by the GDP of each country j during year $t-1$.

We used various sources to calculate the indicators of supporting institutions. In order to capture the effect of legal institutions, we used La Porta et al.'s (1998) classification of countries according to legal tradition. Following the existing literature, this classification takes into account several characteristics of the legal system in each country, including its history, underlying legal theories, and institutional development (Glendon et al., 1994; La Porta et al., 1998; Reynolds & Flores, 1989; Zweigert & Kotz, 1998). La Porta and his colleagues classified countries into five legal traditions: English, French, German, Scandinavian, and formerly socialist. French, German, and Scandinavian legal families all belong to the civil law tradition. Since prior work suggests that countries with a legal system based on English common law provided better investor protection (e.g., La Porta et al., 1998), we use a dummy variable that takes the value of 1 for countries with English legal tradition, and 0 otherwise. In our sample, 30 countries were classified under the English common law category (see Appendix). In results not reported, we also added dummies for the other legal

families, as well as a dummy variable indicating whether English is the official or the most widely spoken language. The results were similar.

We measured local stock market size with total market capitalization as a percentage of GDP (World Bank, 2008). We also considered stock market turnover ratio and changes in the number of listed companies as further indicators of the availability of exit options. Capitalization has the additional advantage that it is correlated with the two ways in which venture capitalists obtain their returns, namely helping ventures go public and finding an acquirer. While a larger capital market facilitates IPOs, it also increases availability of funds, which enables acquisition activity. We measured political institutions (policy stability) with the political constraints index, which captures the limitations on policymakers to unilaterally change the existing policy regime (Henisz, 2000b). This indicator ranges between 0 (most hazardous) and 1 (most constrained, i.e., stable). The political constraint index is historically highly correlated with the risk indexes included in the International Country Risk Guide (ICRG, 1996) (Marshall & Jagers, 2000). We measured each venture capital firm's international experience with the cumulative number of ventures funded by the venture capital firm outside the US as of year $t-1$.

Control Variables

Firm-level control variables. We controlled for three attributes of each venture capital firm in the home market:

- (1) the domestic experience of the venture capital firm, measured as the cumulative number of ventures funded by the venture capital firm in the US as of year $t-1$;
- (2) the prior performance of the venture capital firm, measured as the cumulative number of successful exits (measured as the number of IPOs) that the venture capital firm had achieved as of year $t-1$;
- (3) the centrality score of the venture capital firm in the domestic syndication network, measured with Bonacich's (1987) eigenvector centrality measure, calculated for years $t-3$, $t-2$, and $t-1$ (Guler & Guillén, 2010; Podolny, 2001, 2005).

The centrality score ranges between 0 (for isolated firms) and 1 (for firms that syndicate with other high-status actors). These measures account for size and social status of the venture capital firm, as well

as unobserved firm heterogeneity in skills and capabilities (Bottazzi et al., 2008; Gompers & Lerner, 2000: 236; Hochberg, Ljungqvist, & Lu, 2007; Kaplan et al., 2007). We also controlled for the number of ventures funded by the venture capital firm in foreign countries as of year $t-1$, and the number of countries that the venture capital firm had entered until the end of year $t-1$, in order to control both for unobserved firm heterogeneity in general, and for the propensity to invest abroad in particular.

Country-level and time control variables. We included a time-varying control for the size of the economy, measured as GDP in constant 1995 US

dollars (World Bank, 2008), and for other sources of unobserved cross-national heterogeneity in the first stage of our estimation procedure (see below). In addition, we controlled for the cumulative number of ventures that US venture capital firms had funded in country j as of year $t-1$. This measure accounts for unobserved cross-national differences in taxes and other incentives (Jeng & Wells, 2000). We also included 12 “time pieces,” each of which spans the period of a year.

Descriptive Statistics

Tables 1 and 2 display the sample descriptive statistics and the correlations, which are based on the sample of 137,605 venture capital firm-country-years.

Table 1 Descriptive statistics ($N=137,605$ firm-country-years)

Variable	Mean	Std. dev.	Min.	Max.
1 Patents/GDP	0.802	1.376	0.000	8.760
2 Number of publications/GDP	0.026	0.026	0.000	0.19
3 English legal system	0.343	0.475	0.000	1.000
4 Stock market capitalization (% GDP)	41.818	50.315	0.010	329.960
5 Policy stability	0.566	0.277	0.000	0.890
6 GDP (*10–12)	0.281	0.736	0.001	5.710
7 Foreign VC experience in country (no. of ventures)	4.582	15.074	0.000	157.000
8 VCF's no. of countries entered	2.489	7.771	0.000	40.000
9 VCF centrality	0.038	0.049	0.000	0.230
10 VCF prior performance (no. of IPOs)	6.473	11.262	0.000	81.000
11 VCF's international experience (no. of foreign ventures)	1.946	7.505	0.000	115.000
VCF's domestic experience (no. of ventures)	24.418	38.504	0.000	363.000

Table 2 Correlations ($N=137,605$ firm-country-years)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1 Patents/GDP	1.000											
2 Number of publications/GDP	0.184	1.00										
3 English legal system	−0.015	−0.075	1.000									
4 Stock market capitalization (% GDP)	0.420	−0.051	0.161	1.000								
5 Policy stability	0.371	0.076	0.036	0.239	1.000							
6 GDP (*10–12)	0.515	−0.089	−0.137	0.166	0.191	1.000						
7 Foreign VC experience in country (no. of ventures)	0.553	0.084	0.119	0.317	0.168	0.495	1.000					
8 VCF's number of countries entered	0.012	0.023	0.001	0.020	−0.006	0.000	0.053	1.000				
9 VCF centrality	0.002	−0.001	0.003	−0.002	−0.004	0.003	−0.001	0.146	1.000			
10 VCF prior performance (no. of IPOs)	0.002	0.022	−0.004	0.015	0.004	−0.005	0.028	0.192	0.712	1.000		
11 VCF's international experience (no. of foreign ventures)	0.010	0.020	0.001	0.016	−0.005	0.000	0.044	0.402	0.100	0.221	1.000	
12 VCF's domestic experience (no. of ventures)	0.016	0.041	−0.001	0.032	−0.004	−0.003	0.078	0.268	0.705	0.879	0.271	1.000

year observations. Most of the pairwise correlations are low. The few exceptions involve venture capital firms' domestic experience, prior performance, and centrality. The results reported below are robust to the removal of one, two or three of these variables, indicating that multicollinearity does not seem to be a problem.

RESULTS

Table 3 displays the results of hazard models predicting the rate of each US venture capital firm's entry to a foreign market using the full sample of firm-country-years. Model 1 includes the control variables only. Models 2 and 3 include the measures for technological institutions, legal tradition, size of the local stock market, and policy stability. Model 2 reports results with publications as a measure of technological institutions, and Model 3 reports results with patents. The results lend support to the predictions that the rate of entry to a new country increases with the local level of technology and knowledge (Hypothesis 1), the protection of investors' rights (Hypothesis 2), the size of the local stock market (Hypothesis 3), and policy stability (Hypothesis 4).

Models 4–7 report results with the interaction effects between country institutions and venture capital firm's experience. Model 4 introduces the interaction effects between firms' international experience and country institutions, and Model 5 presents results with interaction effects between firms' domestic experience and country institutions, for comparison. Models 6 and 7 present the full models, with publications and patents, respectively. The results in Models 6 and 7 confirm the prior finding that the technological institutions, the legal institutions, the size of the local stock market and policy stability are positive and significant. The main effect of a venture capital firm's international experience (the number of funded ventures) is positive and strongly significant. The interaction of the firm's international experience and three of the institutional variables (legal system, financial market size, and policy stability) are negative and significant, lending support to Hypothesis 5. In contrast, none of the interactions between institutions and venture capital firm's domestic experience is significant, which indicates that it is only international experience that helps firms overcome the difficulties intrinsic in foreign market entry.

Robustness Checks

We undertook a battery of robustness checks, which resulted in the same pattern of support for the five hypothesized effects. In the first set of robustness checks we ruled out alternative explanations that might originate from the characteristics of venture capital firms and investments. First, we excluded the venture capital firm's performance variable in order to reduce the high correlations among some firm-level controls. Second, we included dummy variables controlling for the three most assiduous investors (Warburg Pincus, Advent International Corporation, and Japan/America Ventures). It is important to note that we already control for each venture capital firm's domestic and international experience. Third, we controlled for each venture capital firm's international experience in early-stage venture capital deals, measured as the number of early-stage and start-up investments in foreign countries as of year $t-1$, to account for the fact that early financing is more difficult to undertake over a long distance, that is, in a foreign country (Wasserman, 2003). This variable was not significant. Fourth, we estimated each model excluding from the dependent variable the 20% of rounds coded by VentureXpert as "late stage," "buyout/acquisition" or "other." The results did not change.

In the second set of robustness checks we ruled out alternative explanations that might stem from the characteristics of countries. First, we explored other indicators for the size and vibrancy of the local equity market. In particular, we calculated for the 95 countries in the sample the net change in the number of listed firms from year $t-1$ to year t . This variable was negative. Second, we controlled for the domestic lending interest rate, as a proxy for investment conditions in each country. This variable was negative and significant, perhaps because high interest rates discourage local entrepreneurship in the first place. Third, in order to test whether the effects of technological institutions, legal traditions or transnational communities were merely artifacts of the level of English language proficiency of the local population, we ran the regressions adding a control for countries in which English is the official or the most widely spoken language. Fourth, in order to control for the incentive structure in the country, we included the Index of Economic Freedom in our analyses (Beach & Miles, 2006). This variable was not significant. Fifth, we controlled for OECD membership, in order to account for the possibility that the factors affecting investment in developed countries

Table 3 Piecewise exponential hazard rate models predicting US venture capital firms' entry into foreign markets, 1991–2002 ($N=137,605$ firm-country-years)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Patents/GDP ^a			0.322** (0.023)	0.344** (0.023)	0.321** (0.024)		0.328** (0.025)
Publications/GDP ^a		13.839** (2.039)				14.233** (2.021)	
English legal system		0.485** (0.137)	0.458** (0.131)	0.540** (0.125)	0.505** (0.123)	0.525** (0.140)	0.541** (0.131)
Stock market capitalization (% GDP) ^a		0.006** (0.001)	0.005** (0.001)	0.005** (0.001)	0.006** (0.001)	0.007** (0.001)	0.006** (0.001)
Policy stability ^a		2.839** (0.575)	1.550** (0.410)	1.650** (0.471)	1.455** (0.473)	2.878** (0.603)	1.512** (0.481)
GDP	0.032 (0.030)	0.221** (0.044)	−0.004 (0.036)	−0.006 (0.036)	−0.011 (0.039)	0.211** (0.047)	−0.004 (0.037)
Foreign VC experience in country (no. of ventures)	0.035** (0.002)	0.019** (0.002)	0.018** (0.002)	0.019** (0.003)	0.018** (0.002)	0.020** (0.002)	0.018** (0.003)
VCF's number of countries entered	0.024** (0.007)	0.024** (0.007)	0.024** (0.007)	0.024** (0.007)	0.023** (0.007)	0.025** (0.007)	0.025** (0.007)
VCF centrality	8.114** (2.108)	8.114** (2.108)	8.114** (2.108)	8.191** (2.099)	7.932** (2.090)	8.404** (2.134)	8.499** (2.132)
VCF prior performance (no. of IPOs)	0.011 (0.010)	0.011 (0.010)	0.011 (0.010)	0.011 (0.010)	0.010 (0.010)	0.011 (0.011)	0.011 (0.011)
VCF's international experience (no. of foreign ventures)	0.017** (0.005)	0.017** (0.005)	0.017** (0.005)	0.039** (0.005)	0.017** (0.005)	0.040** (0.006)	0.042** (0.006)
VCF's US experience (no. of ventures)	−0.009** (0.003)	−0.009** (0.003)	−0.009** (0.003)	−0.009** (0.003)	−0.007 (0.004)	−0.014** (0.005)	−0.013** (0.005)
Patents × VCF's international experience				−0.004* (0.002)			−0.005* (0.002)
Publications × VCF's international experience						−0.369** (0.066)	
English legal system × VCF's international experience				−0.021* (0.011)		−0.019 (0.011)	−0.021* (0.011)
Stock market capitalization × VCF's international experience				−0.000** (0.000)		−0.000** (0.000)	−0.000** (0.000)
Policy stability × VCF's international experience				−0.008 (0.008)		−0.053** (0.014)	−0.022 (0.012)
Patents × VCF's US experience					0.000 (0.000)		0.001 (0.000)
Publications × VCF's US experience						0.049 (0.029)	
English legal system × VCF's US experience					−0.003 (0.002)	0.001 (0.002)	−0.000 (0.002)

Table 3 Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stock market capitalization × VCF's US experience					−0.000*	−0.000	−0.000
					(0.000)	(0.000)	(0.000)
Policy stability × VCF's US experience					0.005	0.024	0.013
					(0.008)	(0.012)	(0.009)
1991	−14.192**	−14.650**	−14.710**	−14.802**	−14.696**	−14.705**	−14.799**
	(0.432)	(0.520)	(0.500)	(0.490)	(0.496)	(0.510)	(0.490)
1992	−13.912**	−14.376**	−14.430**	−14.528**	−14.421**	−14.429**	−14.518**
	(0.360)	(0.451)	(0.431)	(0.416)	(0.425)	(0.436)	(0.415)
1993	−14.961**	−15.413**	−15.384**	−15.476**	−15.381**	−15.463**	−15.463**
	(0.389)	(0.462)	(0.442)	(0.422)	(0.430)	(0.434)	(0.416)
1994	−15.067**	−15.682**	−15.573**	−15.687**	−15.598**	−15.763**	−15.680**
	(0.563)	(0.619)	(0.601)	(0.606)	(0.597)	(0.620)	(0.607)
1995	−14.204**	−14.817**	−14.676**	−14.781**	−14.696**	−14.884**	−14.767**
	(0.278)	(0.311)	(0.294)	(0.301)	(0.297)	(0.315)	(0.303)
1996	−14.323**	−14.944**	−14.751**	−14.858**	−14.774**	−15.010**	−14.838**
	(0.279)	(0.347)	(0.321)	(0.322)	(0.321)	(0.342)	(0.320)
1997	−14.239**	−14.936**	−14.682**	−14.812**	−14.714**	−15.019**	−14.788**
	(0.219)	(0.335)	(0.297)	(0.266)	(0.265)	(0.301)	(0.262)
1998	−14.445**	−15.125**	−14.887**	−15.030**	−14.926**	−15.211**	−14.998**
	(0.238)	(0.290)	(0.262)	(0.264)	(0.265)	(0.287)	(0.266)
1999	−13.727**	−14.439**	−14.405**	−14.570**	−14.452**	−14.531**	−14.532**
	(0.164)	(0.272)	(0.245)	(0.228)	(0.224)	(0.256)	(0.229)
2000	−13.110**	−13.960**	−13.890**	−14.078**	−13.944**	−14.067**	−14.034**
	(0.122)	(0.210)	(0.183)	(0.183)	(0.181)	(0.207)	(0.189)
2001	−14.793**	−15.185**	−15.139**	−15.349**	−15.207**	−15.318**	−15.302**
	(0.282)	(0.279)	(0.268)	(0.282)	(0.282)	(0.292)	(0.289)
2002	−16.013**	−15.958**	−16.137**	−16.350**	−16.221**	−16.105**	−16.307**
	(0.353)	(0.322)	(0.334)	(0.335)	(0.331)	(0.329)	(0.339)
Log likelihood	−2651.3	−2536.6	−2483.4	−2461.3	−2480.6	−2512.2	−2458.6

^aMean centered variable.

Robust standard errors in parentheses.

*p < 0.05; **p < 0.01.

might be different from those in developing countries, and our measures merely capture the level of development. While OECD membership was significant in predicting venture capital investment, our results on predicted effects remained similar. In these models we found robust support for the impact of country institutions on rate of entry, as well as robust support for the interaction effects between institutions and the venture capital firm's international experience. The only exceptions were the lack of significance in interaction effects in some models between the size of the financial markets and international experience, and policy stability and international experience.

We also repeated the analyses with different modeling techniques. First, we estimated the hazard for a venture capital firm's repeated investments in a country with piecewise exponential models with repeated events. In these models we controlled for the non-independence of repeated events by adding a gamma-distributed frailty term shared over venture capital firms, and by stratifying on venture capital firms. We also added two variables, VCF's prior entries in the focal country, and duration since VCF's entry into the country, in models with repeated events. While these two variables were significant, they did not change the reported results. Second, we estimated the number of investments that each US venture capital firm made in each country using zero-inflated negative binomial models. In these models we estimated the likelihood of zero investments using country-level variables (number of patents, English legal system dummy, stock market capitalization, policy stability, and GDP). Third, we repeated the analysis with negative binomial models with firm fixed effects. Finally, we examined the rate of entry in a country sample of country-years only ($n=812$), in order to check whether our results were biased by using firm-country-years as the level of analysis. The results remained similar in each case, although the fixed effects models with interaction effects did not converge.

The estimates reported in Table 3 are not only robust to a variety of changes in the model's specification and to the inclusion of additional control variables, but also large in magnitude. Figure 1 reports the multiplier of the hazard rate of entry evaluated at different levels of each of the hypothesized variables, assuming different degrees of international experience and mean US experience, according to Model 7 of Table 3. When international experience equals 0, the multiplier of

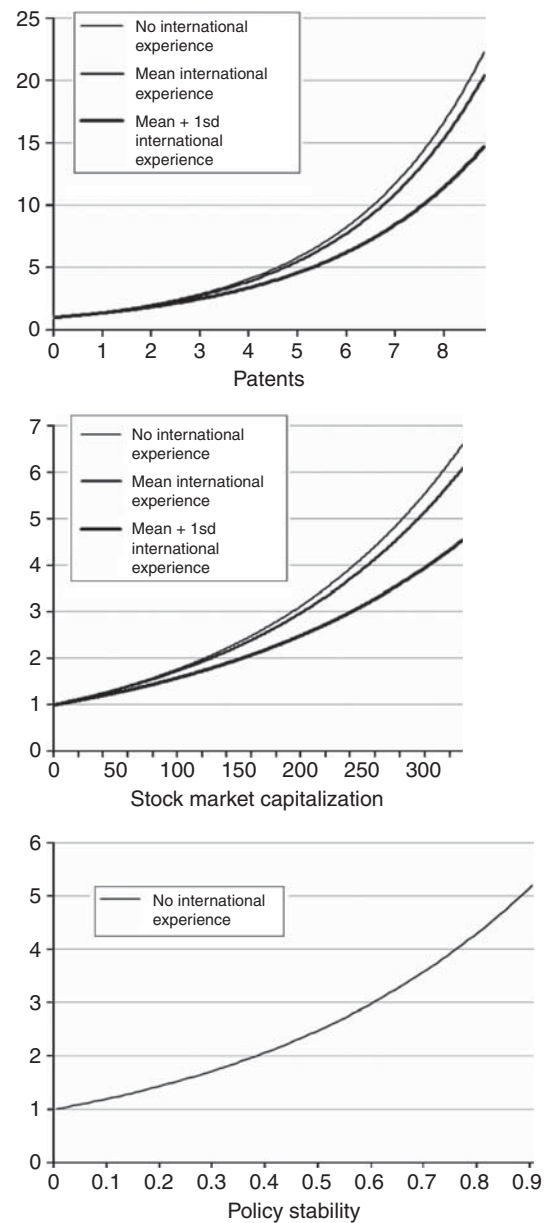


Figure 1 Multipliers of the hazard rate for significant hypothesized variables evaluated at different levels of international experience and mean US experience.

Source: Based on the estimates from Model 7 in Table 3.

the hazard of entry increases approximately 22 times as the patent variable increases from 0 to the maximum value observed in the data set, 6.5 times as the stock market capitalization variable increases from 0 to its maximum value, and five times as the policy stability variable increases from 0 to its maximum value. The multipliers are higher, the lower the international experience. At high levels of patents, stock market capitalization, and policy

stability the mitigating effect of international experience is greatest. Given that English legal tradition is a dummy variable, drawing a chart similar to those reported in Figure 1 is not possible. The moderating effect of international experience is also sizeable for the English legal tradition dummy: for firms with no international experience the multiplier of English legal tradition (as opposed to any other) is almost twice as big as for firms with a level of international experience equal to the mean plus one standard deviation.

DISCUSSION AND CONCLUSION

This paper has offered a systematic analysis of the role of institutions in determining the attractiveness of a foreign country to firms. It contributes to international business research by examining the features of the institutional environment that influence venture capital firms' foreign market entry decisions, and how their effect changes as firms acquire experience. Firms pick and choose the environments in which they wish to operate, largely in terms of the nature and quality of the institutions present in them. Thus firms find it easier to operate in environments in which they have access to the required institutional architecture or infrastructure. Our paper adds to this literature a finer-grained theoretical development of this idea, and robust empirical evidence in its favor. Moreover, we also argued and found that as the firm accumulates international experience, the effect of institutions becomes smaller in size, a finding we interpret as evidence that firms learn to overcome institutional constraints. This interpretation is all the more plausible because domestic experience, unlike international experience, did not moderate the impact of institutional variables.

Our results highlight the importance of national systems of innovation in attracting foreign venture capital investment. Our theoretical and empirical analysis is in line with recent work in international business research emphasizing that firms frequently expand abroad in order to enhance and complement their existing capabilities with new knowledge (Alcacer & Chung, 2007; Chung & Alcacer, 2002). While this body of work has focused on the expansion of firms operating in research-intensive industries through direct investment, especially in R&D activities (e.g., Florida, 1997; Kuemmerle, 1999), the inclination of venture capital firms to do business in countries with a highly developed system of innovation and plentiful technology is

fully consistent with prior findings. Even though venture capital firms may not have the objective to internalize the local sources of knowledge, they still stand to benefit from identifying local entrepreneurial ventures that create and exploit such knowledge.

Our paper contributes to the small but burgeoning literature on international venture capital investments. As opposed to most research in this area, which compares the precedents of domestic venture capital industries (Becker & Hellmann, 2005; Black & Gilson, 1998; Kenney et al., 2002), we focused on the cross-border investments of US venture capital firms, an understudied phenomenon (Wright et al., 2005). We extend prior work in this area emphasizing the domestic supply of venture capital (e.g., Maula & Makela, 2003), by investigating local demand for venture capital (through national systems of innovation), as well as supporting institutions. We also point to the need to treat the choice of international markets as an endogenous one in examining the practices of venture capital firms in those markets.

In particular, we believe that our results on the importance of legal institutions can help improve previous work on cross-national differences in contracting. Prior research has focused on how venture capital firms adapt their practices to legal regimes with poor investor protection through increasing ownership stakes and maximizing their presence on the venture's board of directors (Bottazzi et al., 2008; Kaplan et al., 2007; Lerner & Schoar, 2005). These studies, however, do not correct for the self-selection bias that may accrue when venture capitalists systematically avoid funding otherwise attractive ventures just because they are located in a country with poor investor protection, thus resulting in an econometric underestimation of the impact of legal institutions. Our theoretical argument was that venture capitalists may avoid investing in countries with poor investor protection in the first place, since the need to increase ownership stakes for control purposes would interfere with the logic of portfolio diversification. Our empirical results provide modest evidence that legal institutions may influence the attractiveness of a country for venture capital firms. As such, it can be readily used to calculate the chances that a firm originating from a country with strong investor protections will fund a venture in a country with a legal regime not offering such protections, thus helping assess the true effect of legal tradition on investment by taking into



account the information provided by the non-occurrence of investments, that is, by eliminating the self-selection bias.

While the implications of our research seem to parallel those stemming from studies on foreign direct and portfolio investments, it is important to emphasize that the specific institutions that make a country attractive to foreign venture capitalists are not as relevant for the other types of investment. A country's technological and scientific knowledge stocks are relevant only for a small proportion of foreign direct investment decisions – those having to do with the acquisition of strategic assets. They tend not to be a consideration in the cases of the much more frequent efficiency- or market-seeking direct investments (Dunning, 1998). Similarly, international portfolio investors do not look for opportunities exclusively in the technology area, whereas venture capitalists overwhelmingly do (Gompers & Lerner, 2000). The legal protection of owners' rights is certainly critical to the portfolio investor, but of much less consequence to the direct investor, who tends to acquire a majority stake (Caves, 1996). Similarly, the size and dynamism of the equity market is crucial for making decisions about portfolio investment, but much less important to the direct investor, whose foreign subsidiaries are rarely floated, especially in the extractive and manufacturing sectors. Finally, policy stability is relevant to the portfolio investor, but it affects direct investors seeking market access to a greater extent than those seeking an input, increased efficiency or strategic assets (Caves, 1996; Dunning, 1993). Thus, while these institutions are pertinent to foreign venture capital investments, their relevance to direct or portfolio investments varies from case to case, reflecting the fact that, while venture capital investing shares some features of direct and portfolio investing, it exhibits key peculiarities as well.

Our empirical results also have implications for governments. We found that institutions have a large impact on entry into new markets. The results suggest that the best way for a government to encourage foreign entry in general, and venture capital investment from abroad in particular, is to introduce "horizontal" improvements in the scientific, financial, and political institutional infrastructures, that is, reforms that benefit all firms and entrepreneurs as opposed to just a chosen few. Hence governments would be wise to make information about local opportunities

and institutional mechanisms as widely available as possible.

The research reported in this paper is limited in several respects. First, we examined the international expansion only of US venture capital firms, ignoring the fact that European firms are more internationally oriented because of the small size of their individual home markets (Maula & Makela, 2003). For instance, Hall and Tu (2003) report that venture capital funds located in smaller countries such as Switzerland and Greece made up a bigger proportion of cross-border investments than those based in larger countries, while the recent increase of cross-border investments by UK venture capital funds reflected the maturity of the European venture capital industry. Even though there may be differences in the propensity of venture capital firms to invest abroad based on characteristics of their home countries, we believe our results on the importance of institutions and international investment experience on venture capital firms' international expansion to be generalizable. Second, the analysis in this paper did not take into account the way in which venture capital firms undertake activities abroad, namely by establishing a local office or by conducting business directly from the home country. Third, we did not take into account whether and how venture capital firms transferred their practices in their home country, or adapted them to accommodate the institutional and cultural differences (Ferner, Almond, & Colling, 2005; Kostova, 1999). Fourth, we did not explore whether venture capital firms find foreign countries more attractive depending on the types of co-investors available for syndicating or the presence of other home-country venture capital firms. Last, we did not take into account the amount of capital invested by each venture capital firm, but the event of entry into a country. While this test would provide an important sensitivity analysis, data limitations, as well as the fact that amounts are observable only for actual and not potential investments, prevented us from conducting this test. These limitations offer opportunities to continue integrating research on venture capital with the international business literature on technological and supporting institutions. Future work can also examine the role of network connections across countries in inducing international investment, or the impact of institutions on venture capital practices once the foreign firm starts operating in the foreign country.

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NOTES

¹"The Global Startup," *Forbes Global*, 29 November 2004.

²Erel Margalit, founder of Jerusalem Venture Partners. See "The Global Startup," *Forbes Global*, 29 November 2004.

³Interviews with K.O. Chia, formerly a principal at a Hong Kong VC firm, and Chen Siwei, National People's Congress and Chinese Academy of Sciences.

⁴Other studies have focused on differences in decision-making (Manigart et al., 2000), or on the willingness to invest abroad (Hall & Tu, 2003).

⁵Becker and Hellmann (2005) argue that, while having an active capital market is important to venture capital, it is not sufficient. In the 1970s and 1980s government-supported experiments with establishing a domestic venture capital industry failed in Germany,

in spite of the existence of well-developed capital markets (Becker & Hellmann, 2005).

⁶VentureXpert includes "standard US venture investing" in portfolio companies, as long as the company is domiciled in the US, at least one of the investors is a venture capital firm, venture investment is a primary investment, and it entails an equity transaction.

⁷While the number of venture capital firms represented in the sample may seem high, it should be noted that not all firms are active during the entire period of observation. We checked the sensitivity of our results by excluding VC firms that made fewer than three investments in the US in each year. The results of the analyses with the reduced sample are qualitatively similar to the ones reported here.

⁸Our analyses of this loss of information did not reveal any significant biases in the sense that the years for which information was not available for some of the countries appeared to be random. The countries with more missing years of data on some variables tended to be less developed than the countries with more complete data. In the empirical analysis we control for the level of economic development, which did not alter the general pattern of results. We considered using multiple imputation techniques, but the fact that we are not using ordinary least-squares estimation prevented us from implementing them in an appropriate way.

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APPENDIX: LIST OF COUNTRIES IN THE SAMPLE

Argentina	Honduras	Oman
Armenia	Hungary	Panama
Australia ^a	Iceland	Paraguay
Austria	India ^a	Peru
Azerbaijan	Indonesia	Philippines
Bahrain ^a	Ireland ^a	Poland
Bangladesh ^a	Israel ^a	Portugal
Belgium	Italy	Russian Federation
Bolivia	Jamaica ^a	Singapore ^a
Botswana ^a	Japan	Slovak Republic
Brazil	Jordan	Slovenia
Bulgaria	Kenya ^a	South Africa ^a
Canada ^a	Korea, Republic of	Spain
Chile	Kuwait	Sri Lanka ^a
China	Kyrgyz Republic	Swaziland ^a
Colombia	Latvia	Sweden
Costa Rica	Lebanon	Switzerland
Ivory Coast	Lithuania	Tanzania ^a
Croatia	Luxembourg	Thailand ^a
Cyprus ^a	Macedonia, FYR	Trinidad and Tobago ^a
Czech Republic	Malawi ^a	Uganda ^a
Denmark	Malaysia ^a	Ukraine
Dominican Republic	Mauritius	United Arab Emirates ^a
Ecuador	Mexico	United Kingdom ^a
Egypt	Moldova	United States
El Salvador	Mongolia	Uruguay
Estonia	Morocco	Venezuela
Fiji ^a	Namibia ^a	Zambia ^a
Finland	Nepal ^a	Zimbabwe ^a
France	Netherlands	
Germany	New Zealand ^a	
Greece	Nigeria ^a	
Guatemala	Norway	

^aCountries with English legal tradition.

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