New Venture Internationalization: The Role of Venture Capital Types and Reputation

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Abstract

This study examines how different types of venture capital relate to new venture internationalization. Using a sample of 646 U.S. new ventures that executed IPOs between 1995 and 2010, we find that ventures with foreign or corporate venture capital have higher levels of international intensity. We also investigate the moderating role of VC reputation on the relationship between foreign venture capital and international intensity and corporate venture capital and international intensity. Our results suggest that VC reputation weakens the positive relationship between corporate VC and international intensity.

Keyword: internationalization; venture capital; corporate venture capital.

Introduction

The resource stock of venture capital (VC) providers plays an important role in the development of new ventures and, as more young companies seek to expand outside their home markets, the internationalization of these companies (Fernhaber & McDougall-Covin, 2009; Fernhaber, McDougall-Covin & Shepherd, 2009, Reuber & Fischer, 1997). In addition to providing equity-based financial capital, venture capitalists (VCs) share their knowledge relating to international expansion strategies, thereby facilitating the new ventures' internationalization (Mäkelä & Maula, 2005). While previous work has shown that knowledge plays a critical role in the internationalization of new ventures (Autio, Sapienza & Almeida, 2000), studies also point out that the investors have different knowledge bases (Maula, Autio & Murray, 2005). However, most studies that have investigated the role of VCs in new venture internationalization do not differentiate among the resources provided by different types of VCs, thereby ignoring the capital source that influences recipient strategies (Gupta & Sapienza, 1992). According to Sahlman (1997, p. 107), "From whom you raise capital is often more important than the terms." Investments provided by different types of VCs may have a differential effect on venture conduct and performance (Bertoni, Colombo & Grilli, 2013).

In this study, drawing on the knowledge-based view, we investigate how the different types of VC relate to new venture internationalization. First, we consider different VC types (Bertoni et al., 2013) and examine the different impact of foreign VC and corporate VC on new venture internationalization. Foreign VCs invest from outside the portfolio company's home country (Guller & Guilén 2010). While many VCs exhibit local bias (Cumming & Dai 2010), the amount of cross-border investments has been growing

(Aizenman & Kendall, 2012; Chemmanur, Hull & Krishnan, 2016; Guller & Guillén 2010; Wright, Pruthi & Lockett, 2005), and the prevalence of foreign VC has been increasing. Foreign VCs possess institutional knowledge about foreign markets that can help the internationalization of portfolio companies (Humphery-Jenner & Suchard, 2013). Foreign VCs also possess foreign business knowledge about suppliers and customers that support portfolio companies' international activities (Chemmanur, Hull & Krishnan, 2016). Corporate venture capital (Corporate VC) refers to the investment provided to entrepreneurial ventures by established corporations in exchange for equity (Dushnitsky & Lenox, 2006). In addition to seeking financial returns, corporate VCs often invest in entrepreneurial ventures for strategic reasons related to their technology and markets (Dushnitsky & Lenox 2006). Corporate VCs are part of established multinationals and possess technical knowledge and market knowledge that support new venture internationalization. Corporate VCs possess extensive network knowledge about customers, suppliers and partners as most corporate VC units are in multinational enterprises with an extensive global network of partners (MacMillan, Roberts, Livada & Wang, 2008). Despite indications that different types of venture capital provide different value to portfolio companies, prior research that explores the link between the types of VC and venture internationalization is limited (Maula, Autio & Murray 2005).

Second, we investigate the moderating role of VC reputation on the relationship between VC types (foreign VCs and corporate VCs) and new venture internationalization. Due to a limited history and performance track record, young ventures often cannot rely on their own reputation as they seek to grow (Hsu, 2004). Being associated with a reputable VC can help new ventures overcome the constraints involved in international expansion

(Fernhaber & McDougall-Covin, 2009). We argue that reputation, another important intangible resource provided by reputable VCs, may substitute the knowledge that foreign VCs and corporate VCs provide to the new ventures that internationalize.

This study makes a number of contributions. First, we enrich the existing literature on portfolio company internationalization. Previous work on the role of knowledge and venture internalization mostly examined the knowledge of entrepreneurs (Andersson, 2000; Fillis, 2001; Lindsay, Chadee, Mattsson, Johnston & Millett, 2003; Terjesen & Elam, 2009). More recent research on the role of external partners in venture internationalization (e.g. Fernhaber & McDougall-Covin, 2009; Fernhaber, McDougall-Covin & Shepherd, 2009) has highlighted the important role VCs play in venture internationalization. Yet, most of these studies do not differentiate among different types of VCs. By investigating the link between different types of VCs and venture internationalization, we clarify how the knowledge possessed by foreign VCs and corporate VCs facilitates foreign expansion of their portfolio companies.

We also contribute directly to the literature on venture capital. Prior work demonstrated that different types of VCs provide different value added (Bertoni et al., 2013; Hsu, 2004; Maula & Murray, 2002). Foreign VCs can help increase new ventures' legitimacy in foreign markets and provide support using their network when their portfolio companies expand abroad (Mäkelä & Maula, 2007). Corporate VCs not only help enhance the venture's reputation, but also provide complementary resources to their portfolio companies (Dushnitsky & Lenox, 2005; Katila, Rosenberger & Eisenhardt, 2008). We extend this literature by demonstrating the critical role of knowledge that foreign VC and corporate VC provide on new venture internationalization.

Finally, we enrich the literature on VC reputation (Fernhaber & McDougall-Covin, 2009; Hsu, 2004; Krishnan & Masulis, 2012; Lee, Pollock & Jin, 2011; Nahata, 2008). Prior work shows that VC reputation can add value to the venture by providing better access to management talent, customers, suppliers, other investors and established firms to develop strategic alliances (Krishnan & Masulis, 2012). Research shows that reputation can serve as an important resource when new ventures internationalize (Fernhaber & McDougall-Covin, 2009). By investigating the interplay between VC reputation and VC types on new venture internationalization, we clarify the roles of VC reputation and VC types in new venture internationalization.

The paper is organized as follows. The next section presents our theory and hypotheses on the different types of venture capital and venture internationalization. Then, we explain our data and methods, followed by the presentation of results. Finally, we discuss our results and conclude in the last section.

Theory and Hypotheses

Internationalization can help entrepreneurial ventures to grow and improve performance (Sapienza, Autio, George & Zahra, 2006). Previous research has demonstrated that new ventures that internationalize have higher earnings, market share, ROE, sales growth and technological learning (Bloodgood, Sapienza & Almeida, 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Sapienza et al., 2006; Zahra, Ireland & Hitt 2000). Research has also demonstrated under which circumstances and how internationalization benefits new ventures. For instance, new ventures might internationalize early to develop international business competencies from the beginning, rather than later when path-dependency makes this more difficult (McDougall, Shane, & Oviatt, 1994). New ventures might even be required to internationalize early in response to competitive pressures, in particular when rivals already have an established international presence (Oviatt & McDougall, 1994). Early internationalization of new ventures has been shown to be a viable strategy to bypass the limitations of a small domestic market and capitalize on international market opportunities (McNaughton, 2003). A recent meta-analysis of the relationship between internationalization and firm performance in international entrepreneurship found robust evidence for a positive association between degree and scope of new venture internationalization and firm performance in terms of both profitability and growth (Schwens, Zapkau, Bierwerth, Isidor, Knight & Kabst, 2018). More recently, research on the internationalization of new ventures has expanded its focus, examining what happens to these internationalized ventures as they mature, and developing more fine-grained theory regarding for instance post-entry survival and long-term performance (e.g., Autio, 2017; Cavusgil & Knight, 2015; Faroborzi & Keyhani, 2018; Ibeh, Jones & Kuivalainen, 2018). There is also an increased focus on examining the context, dynamics, and varieties of new venture internationalization (Knight & Liesch, 2016; Ojala, Evers & Rialp, 2018; Reuber Dimitratos & Kuivalainen, 2017).

Knowledge-based view and new venture internationalization

According to the knowledge-based view of the firm, firms are primarily institutions which integrate knowledge, and knowledge is regarded as the most critical resource (Grant, 1996). In the context of international business, knowledge can be leveraged to help with decisions regarding foreign market entry and operations, such as choice of markets, internationalization modes and pace, and to deal with uncertainties which are inherent in internationalization (Kogut & Zander, 1993; Liesch & Knight, 1999; Young, Hammill, Wheeler & Davies, 1989). Knowledge is the most important resource for survival and development of firms that internationalize (Mejri & Umemoto, 2010).

For new ventures that internationalize, the role of knowledge is even more critical. When new ventures internationalize, they face “liability of foreignness” (Zaheer, 1995). In fact, many new ventures experience a decline in performance when they first internationalize (Lu & Beamish, 2001). When new ventures first internationalize, they might not have a sound knowledge of local cultures and institutions, or lack legitimacy in the eyes of potential local customers and partners (Zaheer, 1995). For new ventures, liability of foreignness is exacerbated by liability of newness (Mudambi & Zahra, 2007). As new ventures generally have fewer tangible resources compared to established and large multinationals, they need to exploit tacit resources such as knowledge in order to establish and sustain any international competitive advantage (Kundu & Katz, 2003; Zahra, Matherne & Carleton, 2003). Research has shown that knowledge intensity, the extent to which companies rely on knowledge as source of competitive advantage, is associated with better learning capabilities necessary for international adaptation and subsequent faster international growth for new ventures (Autio, Sapienza & Almeida, 2000). Knowledge can also foster the development of unique products, which allow new ventures to serve particular international markets and increase their market share and sales (Knight & Cavusgil, 2004). Knowledge which plays a key role in new venture internationalization can originate from within the new venture, or externally from investors or other network ties (Bloodgood, Sapienza & Almeida, 1996; Coviello & Munro, 1995; Fernhaber et al., 2009; Reuber & Fischer, 1997; Sharma & Blomstermo, 2003).

The role of VC on new venture internationalization

Venture capitalists are financial intermediaries who invest in privately held companies that are typically small and young (Gompers and Lerner, 2001). In addition to providing financial capital that support new venture internationalization (McDougall, Oviatt & Shrader, 2003), VCs also provide knowledge that facilitates new venture internationalization (Fernhaber & McDougall-Covin, 2009). While knowledge is a critical resource for any firm (Grant, 1996), knowledge is especially important for these new ventures that lack tangible assets (Gompers & Lerner, 2001) and need to cope with the uncertainties of internationalization (Liesch & Knight, 1999).

The knowledge that venture capitalists provide may be based on their own experience or that of other portfolio companies in which they have invested. Such knowledge, offered to PCs directly and as advice, can help young ventures as they internationalize, as market knowledge, knowledge of internationalization processes, and knowledge of international operations are crucial to market entry (Clark, Pugh & Mallory 1997). While many venture capitalists exhibit local bias and prefer to invest in ventures that are nearby (Cumming & Dai, 2010; Cumming & Johan, 2009), the knowledge, experience, and network resources of VC investors may influence the geographic goals of new ventures (Gupta & Sapienza 1992). Venture capitalists with prior experience in foreign countries may perceive less risk related to internationalization (Carpenter, Pollock & Leary 2003) or the need for less knowledge to initiate foreign market entry (Liesch & Knight 1999). They may therefore be more willing to invest in foreign ventures for which they have less knowledge than more local investment opportunities. VCs with international knowledge are more likely to support or even push for new venture internationalization, and can provide the new venture with international knowledge required to recognize international opportunities and expand internationalization activities (Fernhaber & McDougall-Covin, 2009). Prior work also showed that VCs may relocate a venture to another country after they make an initial investment (Cumming, Fleming & Schwienbacher, 2009).

While VCs play a key role in new venture internationalization by providing knowledge necessary to support new venture internationalization (Park, LiPuma & Prange, 2015), prior work also has demonstrated that VCs differ in their knowledge base (Maula, Autio & Murray, 2005). In the next sections, we investigate the knowledge that foreign VCs and corporate VCs provide and their impact on new venture internationalization.

Foreign venture capital

Generally, VCs prefer to invest in domestic ventures (Cumming & Dai, 2010). However, since home markets are increasingly saturated with investors, VCs need to broaden their geographical scope and focus more on international investment opportunities. This has led to an increase in cross-border investments and the prevalence of foreign VCs (Aizenman & Kendall, 2012; Chemmanur, Hull & Krishnan, 2016; Guller & Guillén 2010; Wright et al., 2005).

The term "foreign VCs" refers to VCs located in a country different from the portfolio company's home country (Guller & Guilén 2010). Compared to domestic VCs, foreign VCs have better institutional knowledge about foreign markets and are in a better position to help internationalization of the new ventures (Humphery-Jenner & Suchard, 2013). Foreign institutional knowledge is defined as the "experiential knowledge of government, institutional framework, rules, norms and values" (Eriksson, Johanson, Majkgard & Sharma, 1997, p.343). Companies lacking institutional knowledge find it difficult to develop a suitable understanding of the laws and norms which are prevalent in a foreign market and this extends in particular to tacit rules and conventions such as the way the law is applied by particular government agencies (Eriksson et al., 1997). Foreign VCs share their foreign institutional knowledge, providing support for the internationalization of new ventures (Humphery-Jenner & Suchard, 2013). Institutional knowledge can help reduce the cost of internationalization (Eriksson et al., 1997). As foreign VCs are embedded in local institutions and networks, they can help elicit trust for their non-domestic portfolio companies that may reduce their liability of foreignness and enhance their internationalization.

Foreign business knowledge refers to "knowledge pertaining to customers, competitors and market conditions in particular foreign markets" (Zhou, 2007, p.282). Foreign VCs offer operational support and access to their networks of suppliers and customers (Chemmanur, Hull & Krishnan, 2016). Foreign venture capital investors can mitigate the portfolio company's liabilities of foreignness by providing contextual intelligence that founders may lack and increase legitimacy within both the local market and with home market investors, as their involvement in the syndicate can bring endorsement for the venture (Mäkelä & Maula, 2005). Foreign venture capitalists also expand the venture's social capital by "bringing customer contacts and knowledge of the legal environment, opening doors to other parties such as business partners, and support in recruiting managers from the foreign location" (Mäkelä & Maula, 2005, p.245). Foreign venture capital firms introduce new ventures to more customers and suppliers than do domestic venture capital firms (Pruthi, Wright & Lockett 2003). As argued above, knowledge that foreign venture capitalists possess can facilitate internationalization of their portfolio companies. Therefore, we hypothesize:

Hypothesis 1: Foreign VC is positively related to portfolio company international intensity.

Corporate venture capital

Corporate venture capital refers to “equity investments by established corporations in entrepreneurial ventures.” (Dushnitsky & Lenox, 2006). Corporate VC’s parent corporations are generally multinational and allocate considerable financial resources on global market research (Maula, Autio & Murray, 2005). Embedded in established multinational corporations, corporate VC units have access to non-material technical, market, and business knowledge (Maula & Murray 2001), which can facilitate portfolio company internationalization. When new ventures seek to internationalize, foreign market knowledge, which is critical for foreign expansion, is difficult to obtain (Knight & Liesch 2002). Corporate VCs possess technical knowledge and market knowledge derived from their embeddedness in established multinational corporations and their relationship with business units and such knowledge from corporate VCs facilitates internationalization of portfolio companies. Because new ventures often possess limited tangible resource stocks, intangible resources, specifically knowledge, play a key role for new ventures that internationalize early on (Knight & Cavusgil, 2005). In fact, it is such intangible resources that form the basis for new venture internationalization (Oviatt & McDougall, 1994). Corporate VCs possess “deep specialist knowledge across a range of related sectors as a consequence of their competitive positioning and the accumulation of technical and technological competencies” and together with the knowledge they gain from their customer relationships, Corporate VCs have a profound and enhanced knowledge of the markets (Maula, Autio & Murray, 2005, p.11). Corporate VC investors also provide assistance to portfolio companies based on the linkage to the investing corporation's operational capabilities, permitting portfolio companies to make use of their manufacturing plants, distribution channels, technology or brand. Such capabilities, valuable in their own right, also lead to the development of larger networks for the venture. By providing young companies possessing a "learning advantage of newness" (Autio et al., 2000) with market and technical knowledge, corporate VC providers can help these ventures, facilitating the growth of their business in foreign markets.

Corporate VC investors possess extensive network knowledge. Network knowledge relates to "social and business networks that facilitate the internationalization of the firm." (Mejri & Umemoto, 2010, p.163). As most corporate VC units are in multinational enterprises that typically maintain foreign subsidiaries and have an extensive network of partners worldwide, corporate VC provides strategic access to customers, suppliers, and partners (MacMillan et al., 2008) and helps portfolio companies obtain new foreign customers (Maula et al., 2005). In addition, corporate venture capitalists, via their international network of customers, suppliers, and partners, may more readily monitor the foreign activities of the invested venture. Such monitoring may permit the investor to intervene and provide more timely and relevant advice or contacts in support of the venture's foreign market activities. Generally, independent venture capital providers display lower preferences for geographic diversification because of the difficulty in providing assistance long distance; transnationality compounds this difficulty (Gupta &

Sapienza, 1992). As the knowledge that corporate venture capitalists can facilitate international activities, we hypothesize:

Hypothesis 2: Corporate VC is positively related to portfolio company international intensity.

The moderating role of VC reputation

Expansion into international markets can help ventures to increase sales and facilitate growth (Gilbert, McDougall & Audretsch, 2006). Internationalization, in fact, can provide a chance for the firm to grow significantly and increase performance (Sapienza et al., 2006). However, there are difficulties involved with young ventures expanding abroad. Young ventures expanding abroad face liabilities of foreignness arising from entering a new country as customers, distributors and suppliers prefer to deal with domestic companies (Zaheer, 1995). Moreover, these young portfolio companies have yet to establish their reputation in the local industry (Hsu, 2004). Customers, distributors and suppliers, lacking confidence in the venture and its survival, are unlikely to build a relationship with the new venture (Starr & MacMillan, 1990). Because of their short history, it is difficult for the external parties to evaluate the ventures' quality (Stuart, Hoang & Hybels, 1999), potentially thwarting even an initial order or the commencement of a relationship.

When young ventures expand abroad, having an association with a reputable organization can help these ventures overcome potential problems that arise from being young and foreign. Prospective external partners such as customers and suppliers may consider the reputation of the venture's associates when they evaluate the quality of the venture. Being associated with reputable and prominent organizations can serve as a signal of venture quality and help increase the new venture's reputation since prominent organizations choose their associates carefully in order to avoid damaging their own reputation (Stuart, Hoang & Hybels, 1999). Having an association with a reputable VC who has staked its financial and reputational capital in the venture can facilitate international market expansion by helping the venture to overcome the liabilities of newness and foreignness and "help offset costs or risks related to market unfamiliarity and a lack of legitimacy" (Fernhaber & McDougall-Covin, 2009, p. 281).

While previous work demonstrates that knowledge is critical for new venture internationalization (Mejri & Umemoto, 2010), we argue that reputation, another important intangible resource that the VCs can provide, may substitute the knowledge that foreign VCs and corporate VCs provide to the new ventures that internationalize. Prior work indicates that reputation can impact the behaviors of customers, suppliers and competitors (Lichtenthaler & Ernst, 2007). The substitutability of reputation is more salient in uncertain situations (Shenkar & Yuchtman-Yaar, 1997; Sine et al., 2003). Significant uncertainties exist when new ventures internationalize (LiPuma & Park, 2014). Thus, we hypothesize:

Hypothesis 3a: VC reputation moderates the positive relationship between foreign VC and portfolio company international intensity such that VC reputation weakens the positive relationship between foreign VC and international intensity.

Hypothesis 3b: VC reputation moderates the positive relationship between corporate VC and portfolio company international intensity such that VC reputation weakens the positive relationship between corporate VC and international intensity.

Methods

Data

We test the hypotheses using a cross-industry sample of 646 U.S.-based, VC-backed new ventures that executed an IPO between 1995 and 2010. Following Fernhaber and Li (2013) and Carpenter et al. (2003), a venture was considered to be a new venture if the age of the venture was 10 years or younger at the time of IPO. We compiled the company data from VentureXpert and Global New Issues within Thomson Financial's SDC (henceforth SDC) Platinum database. We included companies from all SDC Venture Economics Industry Codes (VEIC). Technology-based companies dominated IPO markets in the sample period. Since technology-based companies are more likely to receive VC (Gompers, 1995) and to enter foreign markets early in their lives (Johnson, 2004), our choice of context allows for both effective study of the phenomenon as well as generalizability of the results. We obtained data for the ventures' foreign VC and corporate VC receipt from SDC Platinum VentureXpert. This database contains data on all disbursements of venture capital received by U.S. companies and identifies different types of venture capital. We obtained data on foreign activity from SEC filings (S-1 and 10K).

Dependent variable

The dependent variable is *International intensity*. International intensity measures the percentage of foreign sales over total sales (FSTS) during the IPO year. FSTS is a frequently used measure of internationalization (e.g. Preece et al., 1999; Zahra et al., 2000). We obtained FSTS from SEC filings (S-1s and 10-Ks) required prior to IPO.

Independent variables

The independent variable *Foreign VC* is the percentage of foreign VCs, measured using the number of foreign VCs that invested in the focal venture divided by the number of total investors in the focal venture.

The independent variable, *Corporate VC* is the percentage of corporate VCs, measured using the number of corporate VCs that invested in the focal venture divided by the number of total investors in the focal venture.

The independent variable *VC reputation* is based on the Lee-Pollock-Jin VC Reputation Index (Lee, Pollock & Jin, 2011). This index is a multi-item VC reputation index based on "the total number of portfolio companies a VC invested in; the total funds invested in portfolio firms; the total dollar amount of funds raised; the number of individual funds raised; the number of firms taken public; and VC age" (Lee, Pollock & Jin, 2011, p. 41). We calculated the percentage of reputable investors, measured using the number of top quartile VCs from the Lee-Pollock-Jin VC Reputation Index (Lee, Pollock & Jin, 2011) that invested in the focal venture divided by the number of total investors in the focal venture. Our use of the top quartile is consistent with previous work on VC reputation which has also examined the ventures with VCs in the top reputation quartile (Krishnan et al., 2011).

Control variables

We address other factors potentially related to internationalization by adding various control variables. We include venture *Age*, measured in years between the date of venture formation and the IPO date. Previous work on internationalization has shown that internationalization is a function of firm age (Johanson & Vahlne, 1977). *Size* is the natural log of the number of employees of a focal venture (George, Wiklund & Zahra, 2005; Maula

& Murray, 2001). Internationalization is costly and it may be easier for ventures with more resources to expand abroad. We also include *International Experience* of top management team. Following Fernhaber et al. (2009), we examined the IPO prospectus for each venture and coded each top management team member as 1 "if their biography indicated they had held a position overseeing the international component for a previous employer or had worked in a foreign company or for the foreign subsidiary of a U.S. company" (Fernhaber et al., 2009, p. 305) and 0 otherwise, which was summed for each venture to denote international experience. We control for *Funds*, measured as the natural log of the total equity investment received by a focal venture. The amount of investment has been linked to performance (Chang, 2004) and may potentially impact foreign expansion of the venture. We also control for *Total investor*, a count of the number of all the investors invested in the focal venture. Additionally, we control for *Investor Size*, by taking the natural log of the size of the largest VC that invested in the company and *Investor Experience*, measured using the maximum number of investments in thousands made by the investors that invested in a focal venture (Humphery-Jenner & Suchard, 2013), as investor size and investments can impact firm performance. *Syndication* is a dichotomous variable that indicates whether the investments that the focal venture received were syndicated. We control for the *IPO year* since the ventures in the sample vary in terms of their IPO timing. A dichotomous variable *Bubble* controls for the dot-com crash, with a value of 1 for the new ventures that went public before the dot-com crash and a value of 0 otherwise. Finally, we include dummies for all SDC *Industries* in the sample. Studies indicate that there is industry variation in terms of VC participation (Gompers, 1995; Keil, Zahra & Maula, 2016) and performance (McGahan & Porter, 1997).

Results

Table 1 presents the descriptive statistics and correlations for the variables in the sample. The correlations are generally low. The variance inflation factor was also below the 10 standard benchmark (Hair, Anderson, Tatham & Black, 1998), so there was no concern with multicollinearity. 34.7% of the portfolio companies were internationalized in our sample. Of those that internationalized their average international intensity was 35.2%. Foreign VCs made up on average 4% of the total investors in a focal venture and corporate VC made up on average 11% of the total investors that invested in a focal venture.

Models 1 and 2 in Table 2 show the results of Tobit regression. We used Tobit regression due to the left censoring of the variable *International intensity* (Fernhaber & McDougall-Covin, 2009), as not all companies in the sample have foreign sales. Tobit regression has been used in previous studies that examined international intensity (e.g. Fernández & Nieto, 2006; Rodríguez & Rodríguez, 2005). Model 1 includes only the control variables and Model 2 adds the variable *Foreign VC* testing Hypothesis 1. The coefficient estimate for the variable Foreign VC is positive and significant, supporting Hypothesis 1 which proposed that foreign VC participation in the venture is positively related to the venture's international intensity. If foreign VC participation in a new venture were to increase by one percentage point, the international intensity of the new venture would increase by 0.779 percentage points. This means that if foreign VC participation in a new venture were to increase by one standard deviation (0.09), the international intensity of the new venture would increase by 7.011 percentage points.

Model 3 in Table 2 adds the variable Corporate VC testing Hypothesis 2 which proposed that corporate VC participation in the venture is positively related to the venture's international intensity. The coefficient estimate for the variable Corporate VC is positive and significant, supporting Hypothesis 2 which proposed that corporate VC participation in the venture is positively related to the venture's international intensity. If corporate VC participation in a new venture were to increase by one percentage point, the international intensity of the new venture would increase by 0.39 percentage points. This means that if corporate VC participation in a new venture were to increase by one standard deviation (0.14), the international intensity of the new venture would increase by 5.46 percentage points.

Hypothesis 3a proposed that VC reputation moderates the relationship between foreign VC and internationalization and Hypothesis 3b proposed that VC reputation moderates the relationship between corporate VC and internationalization. Model 4 in Table 2 adds the interaction term Foreign VC x VC reputation and Corporate VC x VC reputation.

The coefficient estimate for the interaction term Foreign VC x VC reputation is not significant. While the interaction coefficient is not significant, we examine the confidence intervals to avoid understating interaction results as the marginal effect may statistically differ from zero for certain values of the moderating variable (Kingsley, Noordewier, & Vanden Bergh, 2017). Figure 1 displays the interaction with respect to how VC reputation moderates the positive relationship between foreign VC and international intensity. Contrary to what we predicted, the plot does not show that the main effect is attenuated when reputation increases. The corresponding confidence intervals show that foreign VC has a significant positive effect on the lower values of reputation, but the effects are not statistically different from zero on the higher values of reputation. Hypothesis 3a is not supported.

The interaction term Corporate VC x VC reputation is negative and significant. Figure 2 displays the interaction with respect to how VC reputation weakens the positive relationship between corporate VC and international intensity. The plot is consistent with our hypothesis. Once again, we examine the confidence intervals to avoid overstating interaction results (Kingsley, Noordewier, & Vanden Bergh, 2017). The corresponding confidence intervals show that the marginal effect is statistically different from zero only for lower values of reputation. However, a large part of reputation values are low (38% are below 0.15). These findings lend partial support for Hypothesis 3b.

Additional analyses

We conducted additional analyses to check the results of our Tobit analyses. We reran the analyses using interval regression. Interval regression accounts for the left censoring of the dependent variable international intensity and has been used in previous study on international intensity (Fernhaber et al., 2009). The results of the interval regression analyses showed qualitatively similar results.

We also conducted additional analyses to check our results. Instead of using the percentage of the foreign VCs and corporate VCs as independent variables, we re-conducted our Tobit analyses using the percentage of foreign venture capital funding and the percentage of corporate venture capital funding that the focal venture received. The analyses showed qualitatively similar results.

Furthermore, we conducted additional analyses to investigate whether other forms of capital received by the venture are complements or substitutes with the foreign VC or corporate VC. Previous work shows that different forms of finance such as capital from angels, incubators, universities and government can interact with VC funding which may impact scale-up finance and initial public offerings (Cumming et al., 2018). We examined the interaction between the foreign VC and angel investors, and corporate VC and angel investors on new venture internationalization. We did not find any significant effects for these interaction terms. We also investigated the interaction between foreign VC and government grants, corporate VC and government grants, foreign VC and universities, corporate VC and universities, foreign VC and incubators, and corporate VC and incubators. None of the interaction terms was significant. However, it is important to note that the number of ventures in the sample that received funding from governments (n=25), universities (n=11), and incubators (n = 7) was very limited and the results should be interpreted with caution.

Finally, we checked for endogeneity, which is an important issue in research related to internationalization (Reeb, Sakakibara & Mahmood, 2012). In our study, the possible concern is that the international activities of new ventures may cause the foreign VC, corporate VC and reputable VC to invest, instead of the foreign VC, corporate VC and reputable VC facilitating internationalization. We address this endogeneity issue following Humphery-Jenner and Suchard's (2013) method of investigating subsamples in which endogeneity is less likely to be present. We examine the subsample of companies that received investment within their first year of founding. Very young ventures are less likely to have international activities and therefore endogeneity might be less likely to hold for the set of very young portfolio companies. The analyses showed qualitatively similar results.

Discussion and Conclusion

This paper investigated how different types of VCs relate to venture internationalization. Our results show that foreign VC is positively related to the international intensity of the new venture. Foreign VCs offer foreign institutional knowledge (Humphery-Jenner & Suchard, 2013) and knowledge about customers and business partners in a foreign country (Mäkelä & Maula, 2005), which may support the internationalization of new ventures. Our findings also indicate that corporate VC is positively related to the international intensity of the new venture. Corporate VCs that are linked to established multinational corporations provide network knowledge about customers, suppliers, and partners (MacMillan et al., 2008) and profound and enhanced knowledge of the global markets (Maula, Autio & Murray, 2005). While we did not find support for the hypothesized moderating role of VC reputation on the relationship between foreign VC and new venture internationalization, our results show that the investment from reputable VC weakens the positive relationship between corporate VC and international intensity. This effect is only significant at lower values of VC reputation. Reputable VCs can facilitate new venture's foreign expansion by enabling the venture to draw on VC's reputation and providing legitimacy which help liabilities of newness and foreignness (Fernhaber & McDougall-Covin, 2009). Prior work showed that reputation can act as a substitute for knowledge (Shenkar & Yuchtman-Yaar, 1997, Sine et al., 2003), and our results show that reputation substitutes the knowledge that corporate VCs provide in the context of new venture internationalization.

We contribute to the literature on new venture internationalization. We extend previous work that examined the role of VCs in new venture internationalization (e.g. Fernhaber & McDougall-Covin, 2009; Fernhaber, McDougall-Covin & Shepherd, 2009; Mäkelä & Maula, 2005; Park et al., 2015). Drawing on the knowledge-based view, our investigation of how different types of venture capital (foreign VC and corporate VC) and reputation relate to new venture internationalization provides a more fine-grained view of the support different VCs provide in new venture internationalization. Knowledge sourced externally from foreign VCs and corporate VCs can play an important role when new ventures internationalize.

We also enrich the literature on venture capital. Previous studies have investigated different value-added provided by different VCs (Bertoni, Colombo & Grilli 2013; Hsu, 2004; Humphery-Jenner & Suchard, 2013; Maula & Murray 2002). We demonstrate that VCs have heterogeneous knowledge bases, thus foreign VCs and corporate VCs provide different value-added when new ventures internationalize. Our study may help explain the mixed results in the previous studies that examined the relationship between the VC and new venture internationalization (Fernhaber & McDougall-Covin, 2009). Our results show that the magnitude of the positive impact on new venture internationalization is higher for foreign VCs compared corporate VCs. We demonstrate that not all VCs can provide the same level of support for new ventures that internationalize.

Finally, we contribute to the literature on VC reputation (Fernhaber & McDougall-Covin, 2009; Hsu, 2004; Krishnan & Masulis, 2012; Nahata, 2008). Our paper demonstrates that reputation, another important intangible resource that VCs provide, may substitute the knowledge that corporate VCs provide to aid portfolio company internationalization. The positive relationship between corporate VC involvement and new venture internationalization diminishes when reputable VCs invest in the new venture. This finding points to the important role that VC reputation plays in new venture internationalization. Reputable VCs can facilitate new venture's foreign expansion by enabling the venture to draw on VC's reputation and providing legitimacy that helps overcome liabilities of newness and foreignness (Fernhaber & McDougall-Covin, 2009). Reputable VCs may also exert more control rights on portfolio companies, aiding in their professionalization and enhancing their abilities to successfully deal with the complexities of foreign operation. While we demonstrate that reputation may serve as a substitute for VC's knowledge as in the case of corporate VCs, our results also suggest that reputation does not substitute the knowledge that foreign venture capitalists provide. The contextual knowledge that FVCs provide may not be substitutable by a reputable VC investor. We provide a more fine-grained view of the interplay between VC reputation and knowledge that different VCs provide in new venture internationalization.

While the focus of our paper was on VC and how different types of VC impacts new venture internalization, future research may investigate whether different forms of finance such as funds received from crowdfunding, angels, incubators, universities and government that ventures receive are complements or substitutes. For instance, previous literature found that angel investment is more sensitive to international differences (Cumming & Zhang, 2019) and incubators and VCs are substitutes in terms of advice and support provided (Cumming et al., 2019). Prior work also suggests that crowdfunding may facilitate internationalization of start-ups (Cumming & Johan, 2017). Given the limited nature of our sample, future investigation into interactions between different forms of finance on new venture internationalization would enable scholars to better understand the link between venture financing and internationalization. Additionally, our study only looks at U.S.-based new ventures. Extensions of this study may investigate how different types of investors may impact the internalization of new ventures that are based in emerging countries. Prior work shows that VCs from developed economy who invest in new ventures based in emerging economy can lower psychological, managerial, and financial barriers when these ventures consider internationalization (Yamakawa, Peng & Deeds, 2008). We should also note the implications of restricting our sample to ventures that have executed an IPO. The characteristics, motivations, and behaviors of these companies may be significantly different from those that have chosen to stay private. This selection bias is particularly relevant to our study in that CVC-backed ventures are less likely to execute IPOs (Cumming, Knill and Syvrud, 2016; Kim and Park, 2017). As IPOs of their portfolio companies provide fewer strategic advantages, CVCs are less motivated to take them public (Kim and Park, 2017). In addition, CVC-backed ventures are more likely to go bankrupt (Cumming et al., 2016), suggesting a survivorship bias in our sample. Such sample biases and their relationship to CVC may affect our findings regarding internationalization of CVC-backed ventures. A limitation of this study may thus be its generalizability to private ventures. Extensions of this paper with samples including non-IPO companies may discover if and how VC-backed IPO and non-IPO ventures differ in their international intensity.

Overall, this study extends the current understanding of VC's role in new venture internationalization. Decomposing the venture capital investors into different types permits a more nuanced analysis of their respective resources, adding a more fine-grained understanding of how venture capital support new venture internationalization.

Managerial relevance

This study has implications for practitioners. For venture capitalists, who develop syndicates that require time to construct and incur increased communication and coordination costs for foreign partners, a greater understanding of the value-added for various VC types may inform their syndicate construction. Understanding the respective benefits of different VCs such as foreign VCs and corporate VCs, and VC reputation, can help entrepreneurs to make more informed decisions about investors and international strategies.

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TABLE 1

Descriptive Statistics and Pairwise Correlations

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1.	International intensity	0.12	0.23	1.00											
2.	Foreign VC (FVC)	0.04	0.09	0.14	1.00										
3.	Corporate VC (CVC)	0.11	0.14	0.03	0.00	1.00									
4.	VC Reputation	0.21	0.18	0.04	-0.09	-0.03	1.00								
5.	Age	5.14	2.26	0.18	0.13	-0.04	0.00	1.00							
6.	Size	5.18	1.18	0.05	-0.08	-0.05	-0.15	-0.05	1.00						
7.	International experience	1.65	1.56	0.11	0.12	0.02	-0.05	-0.03	0.10	1.00					
8.	Bubble	0.43	0.50	-0.17	-0.21	0.06	0.10	-0.35	0.02	-0.08	1.00				
9.	Funds	10.86	1.18	-0.04	0.07	0.07	-0.07	0.05	0.18	0.13	-0.31	1.00			
10.	Total investor	8.65	5.17	-0.05	0.09	0.22	0.12	0.11	-0.19	0.13	-0.10	0.40	1.00		
11.	Investor size	8.75	1.67	-0.03	-0.01	-0.04	0.13	-0.12	0.19	0.12	0.03	0.40	0.34	1.00	
12.	Investor experience	24.43	15.83	-0.01	-0.05	0.06	0.10	0.01	-0.25	-0.06	0.12	0.03	0.31	0.01	1.00
13.	Syndication	0.99	0.08	0.04	0.04	0.06	0.09	0.05	-0.05	0.07	-0.05	0.19	0.12	0.15	0.12

TABLE 2
Results of Tobit Analysis for International Intensity

	Model 1			Model 2			Model 3			Model 4		
Variable	Coef.	Std. Err.	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err.	P-value
Constant	-1.831	49.654	0.971	-1.834	49.570	0.970	-1.996	126.615	0.987	-1.989	126.673	0.987
Age	0.041	0.012	0.000	0.038	0.012	0.001	0.040	0.012	0.001	0.039	0.012	0.001
Size	0.006	0.024	0.790	0.007	0.024	0.754	0.006	0.024	0.786	0.007	0.024	0.756
International experience	0.050	0.014	0.001	0.044	0.014	0.002	0.045	0.014	0.002	0.046	0.014	0.001
Bubble	-0.523	0.158	0.001	-0.517	0.160	0.001	-0.509	0.158	0.001	-0.522	0.159	0.001
Funds	-0.040	0.024	0.096	-0.038	0.024	0.112	-0.039	0.024	0.097	-0.042	0.024	0.079
Total investor	-0.004	0.006	0.458	-0.005	0.006	0.383	-0.008	0.006	0.168	-0.007	0.006	0.223
Investor size	-0.004	0.016	0.822	-0.003	0.016	0.876	0.003	0.016	0.841	0.007	0.016	0.677
Investor experience	0.002	0.002	0.201	0.002	0.002	0.138	0.003	0.002	0.109	0.003	0.002	0.106
Syndication	1.806	49.654	0.971	1.759	49.570	0.972	1.878	126.614	0.988	1.828	126.673	0.988
Reputation	0.263	0.130	0.044	0.291	0.129	0.024	0.332	0.130	0.011	0.517	0.154	0.001
Foreign VC (FVC)				0.779	0.241	0.001	0.773	0.240	0.001	0.952	0.332	0.004
Corporate VC (CVC)							0.391	0.171	0.022	0.716	0.234	0.002
FVC x Reputation										-1.148	1.366	0.401
CVC x Reputation										-1.881	0.923	0.042
Observations		646			646			646			646	
Log likelihood		-322.654			-317.443			-314.814			-312.293	
LR chi2		152.700			163.120			168.380			173.420	
Prob > chi2		0.000			0.000			0.000			0.000	
Pseudo R^2		0.191			0.204			0.211			0.217	

Not shown are the industry and IPO year dummies that were included.

FIGURE 1
Interaction Plot: Foreign VC and VC Reputation

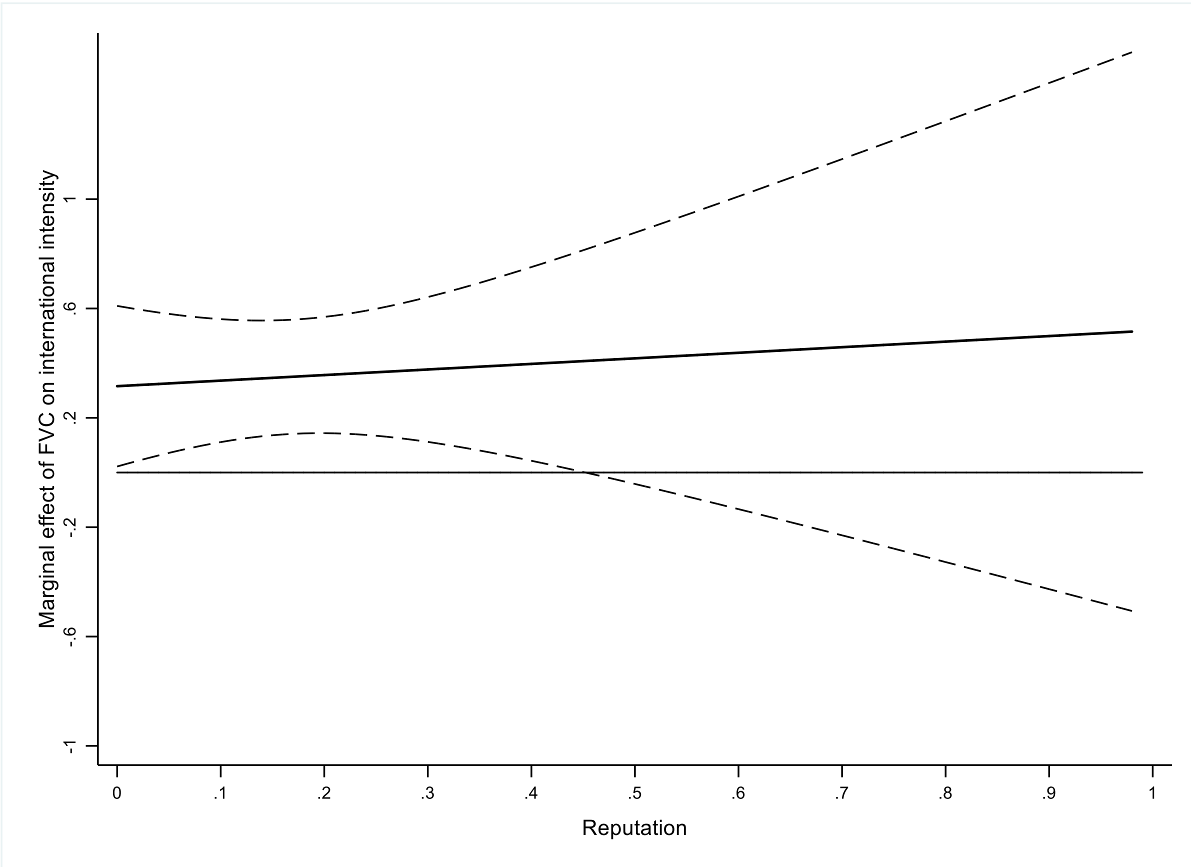

FIGURE 2
Interaction Plot: Corporate VC and VC Reputation