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Gain initial endorsement from the core: market entry, initial partners, and embeddedness in the venture capital market

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Abstract

This study draws attention to the embedding process of market entrants, by examining the initial and subsequent partnerships of *de alio* entrants versus *de novo* entrants. Although *de alio* entrants have access to superior resources from their parents, they may encounter more resistance from the market as they project impure identity, introduce different logics, and pose greater competitive threats. Analyzing a sample of new entrants in the venture capital market, we find that while *de alio* entrants are less likely to establish initial partnerships with mainstream incumbents (i.e. receiving an overall initial resistance from the market), they are more likely than *de novo* entrants to establish ties with high-status incumbents (i.e. gaining more initial endorsement from the core). Results also show that initial network positions allow *de alio* entrants to sustain gaining prestigious endorsement in the later period, and at the same time to offset the overall resistance from mainstream incumbents. Our findings contribute to the literature on market entry and corporate demography.

JEL classification: D21, D85, M13

1. Introduction

Market entrants constantly emerge and interrupt existing market equilibrium (Helfat and Lieberman, 2002; Markman and Waldron, 2014). They can be either *de alio* entrants that are established by existing organizations or *de novo* entrants founded by entrepreneurial individuals (Carroll *et al.*, 1996). When entering a market, *de alio* entrants intensify competition, as do *de novo* entrants (Caves, 1998; Abraham *et al.*, 2007). However, while *de novo* entrants usually align with the entered market, *de alio* entrants are complicated because of their affiliations with parents outside the market[1] (Khessina and Carroll, 2008; York and Lenox, 2014). As such, even though *de alio* entrants inherit superior resources that they can leverage for embedding themselves into the market (Carroll *et al.*, 1996; Agarwal *et al.*, 2004; Pe'er *et al.*, 2008), they may encounter more resistance when introducing different logics

1 We use "parents" to indicate organizations that establish *de alio* entrants. However, in the diversification literature, the term is often used only for spin-offs. It is important to clarify that in our theorizing, *de alio* entrants are the units established by existing organizations, rather than spin-offs.

and posing greater competitive threats (Fligstein, 2002; Jensen, 2008; Sahaym, 2013). Although being well embedded is vital for entrants to gain legitimacy and resources (Oliver, 1990; Sorenson and Stuart, 2001; Hochberg *et al.*, 2007), being resisted by incumbents will retrain them from realizing full potentials (Jensen, 2008). Despite the importance of embeddedness to market entrants, however, we know little about the embedding process of *de alio* entrants versus *de novo* entrants.

To shed lights on that, this article draws attention to the initial partnerships formed by market entrants. If entrants are able to secure initial partnerships with mainstream or prestigious incumbents, they are well accepted and embedded at the entry process (Jensen, 2008). Analyzing initial partnerships is necessary for at least two reasons. First, entrants are most vulnerable, so forming initial ties with incumbents is crucial for their survival and growth (Freeman *et al.*, 1983; Singh and Mitchell, 2005; Stuart and Sorenson, 2007; Hallen, 2008). Second, because of network inertia and rigidity, future networks and benefits are mostly derived from their initial partnerships (Li and Rowley, 2002; Kim *et al.*, 2006; Keil *et al.*, 2010).

By focusing on the initial embedding process, our study contributes mainly to the literature on corporate demography and market entry. Research on corporate demography is essentially concerned about the emergence and performance of *de alio* and *de novo* entrants (King and Tucci, 2002; Ganco and Agarwal, 2009; York and Lenox, 2014; Wang and Tan, 2019). Although earlier work has highlighted the initial performance advantages of *de alio* entrants over *de novo* entrants (Carroll *et al.*, 1996), recent scholarship stresses the importance of understanding how the advantages are produced (Khessina and Carroll, 2008). Existing studies emphasize that the two types of entrants diverge in their product and technology strategies (Bayus and Agarwal, 2007; Chatterji, 2009; Carnabuci *et al.*, 2015), which leads to their performance differentiation. Adding to research in this stream, our study shifts attention from product strategies to the network embedding process of market entrants. More concretely, we argue that *de alio* entrants are better able to form initial partnerships with high-status incumbents, thereby providing a new perspective to understand their performance advantages over *de novo* entrants.

We continue to ask whether their initial network differences will persist over time. In addition to analyzing initial differentials between entrants, prior literature pays substantial attention to examining the persistency of those differentials. A stylized fact is that the initial advantages of *de alio* entrants tend to fade away (Carroll *et al.*, 1996; Bayus and Agarwal, 2007). Although *de alio* entrants have superior initial resources, *de novo* entrants are more flexible. The flexibility enables *de novo* entrants to surpass *de alio* entrants at later stages, particularly when the environment is turbulent (Khessina and Carroll, 2008). Although evidence is found in product and technology competition (Bayus and Agarwal, 2007), we doubt that their network advantages will also fade away. Network advantages are known to be cumulative and self-reinforcing, because networks are rigid and inertial (Li and Rowley, 2002; Kim *et al.*, 2006; Hallen, 2008; Keil *et al.*, 2010). If so, *de alio* entrants may be able to sustain their network advantages over *de novo*. By examining the subsequent networks of *de novo* and *de alio* entrants, we provide direct evidence on whether and how their initial network differentials are sustained.

We tested the hypotheses in the venture capital market, by comparing the embedding process of *de alio* CVC entrants (i.e. new corporate venture capital firms) and *de novo* IVC entrants (i.e. new independent venture capital firms). The context fits well with our theory for two main reasons. First, as compared with IVC entrants who have a focused VC identity and aligned logics, CVC entrants adopt very different logics and pose greater competitive threats (Hallen et al., 2014; Souitaris and Zerbinati, 2014; Pahnke *et al.*, 2015). Second, network embeddedness is an important source of competitive advantages in the venture capital context (Sorenson and Stuart, 2001; Hochberg et al., 2007). The empirical findings from the VC context are generally consistent with our hypotheses based on corporate demography and market entry. However, they could also be driven by the context-specific competition nature. As such, we discuss the generalizability and limitation of our findings quite extensively at the end.

2. Theory and hypotheses

2.1 Market entry: *de alio* versus de novo entrants

Scholars have studied for long the antecedents, strategies, and performance of market entrants. Population ecologists, for instance, explore how density determines the emergence of new entrants (Carroll and Khessina, 2006); industrial and institutional theorists focus on the role of economic, political, and sociocultural environments in shaping market entry (Caves, 1998; York and Lenox, 2014; Wang and Tan, 2019); strategy researchers pay more attention to the

performance implications of entry strategies and timing (Bayus and Agarwal, 2007; Zachary *et al.*, 2015). One of the central themes on market entry is how incumbents respond to market entrants. Prior literature emphasizes that incumbents may adopt various entry deterrence strategies (e.g. predatory pricing and capacity expansion) to reduce product–market competition, particularly when their market positions are threatened (Caves, 1998; Abraham *et al.*, 2007; Markman and Waldron, 2014).

Although traditional research focuses on the rivalry and retaliation between incumbents and entrants (Caves, 1998; Abraham *et al.*, 2007; Markman and Waldron, 2014), the relational discrimination perspective draws attention to their collaboration activities (Jensen, 2008). It highlights that incumbents may use collaborative relationships to exclude and include entrants, so as to sustain industry logics and reduce competitive threats (Fligstein, 2002). For instance, if entrants threaten to destabilize the established industry logics and heighten competitive tensions, incumbent may disfavor collaboration with them (Jensen, 2008). Indeed, Jensen (2008) finds that incumbents disfavor collaborations with high-status entrants as compared with collaborations with high-status incumbents. That is because high-status entrants pose stronger threats to replace the established logics with new industry logics.

There are mainly two types of market entrants: *de alio* and *de novo* entrants (Carroll *et al.*, 1996; Helfat and Lieberman, 2002). *De alio* entrants are founded by existing organizations for various reasons such as developing new businesses, increasing economic profits, and gaining access to superior technologies and resources (Chesbrough, 2002; Jensen, 2008; York and Lenox, 2014). Commercial banks, for instance, rolled into the investment banking market since late 1980s to acquire investment businesses (Jensen, 2003); large corporates from various industries flooded into the venture capital market to source new technologies (Gompers and Lerner, 2001; Dushnitsky, 2006; Souitaris and Zerbinati, 2014); oil and chemical companies stretched to the solar PV industry, as a reaction to the recent green moves (Georgallis *et al.*, 2019). *De novo* entrants, on the other hand, are founded by independent individuals to fill empty market space. When identifying open space that is not covered by existing offerings or space that is covered but still demands improvements, individual entrepreneurs orchestrate resources to establish *de novo* entrants and offer products or services for that particular space.

Prior literature has highlighted various differentials between *de alio* and *de novo* entrants (Carroll *et al.*, 1996; Khessina and Carroll, 2008; Ganco and Agarwal, 2009; Carnabuci *et al.*, 2015). On the one hand, *de alio* entrants are more likely to gain initial performance advantages for two main reasons (Carroll *et al.*, 1996; Bayus and Agarwal, 2007). First, as compared with *de novo* entrants, *de alio* entrants have access to superior resources from their parents (Helfat and Lieberman, 2002; Jensen, 2003). The abundant resources both enable *de alio* entrants to better establish their market positions, and provide them a longer period of immunity from market competition (Khessina and Carroll, 2008). Second, parental affiliations provide interorganizational endorsement that enhances the legitimacy of *de alio* entrants (Jensen, 2003; York and Lenox, 2014). There is considerable uncertainty about the quality of market entrants, as the entry process is full of hazards (Zachary *et al.*, 2015). Affiliating with established organizations signals the quality and credibility of *de alio* entrants.

On the other hand, however, *de alio* entrants may suffer from their impure identity. *De alio* entrants inherit the market identities of their parents, which may be inconsistent, or even competing, with those of mainstream incumbents (e.g. green startups established by oil corporates). And unlike *de novo* entrants who usually follow the traditional industry logics in a market, *de alio* entrants often threaten to destabilize the established logics with new logics that favor themselves (Fligstein, 2002; Jensen, 2008). If incumbents perceive those new logics as threatening, they may resist the entry of *de alio* entrants through relational discrimination (Jensen, 2008). In other words, *de alio* entrants may encounter more resistance, as they pose greater competitive threats than *de novo* entrants. Indeed, as oil and chemical companies entered the market of environment-friendly products, their offerings faced strong opposition (Georgallis *et al.*, 2019). It is similar in the VC market. Although CVC entrants enjoy the advantages of resource endowments, their identity and logics are not aligned with the traditional ones (Hellmann, 2002; Dushnitsky and Shaver, 2009; Pahnke *et al.*, 2015). As a result, CVCs risk being excluded from investment syndication, particularly in the early days (Gompers and Lerner, 2001).

Overall, we see two main competing forces here: on the one hand, *de alio* entrants have superior resources that they can leverage to better embed themselves into the entered market; on the other hand, *de alio* entrants project impure identity, introduce different logics, and pose greater competitive threats, so that their entry may be relationally resisted (Jensen, 2008; Sahaym, 2013). It is therefore necessary to explore what entrants—*de alio* or *de novo*—gain actual advantages in the embedding process. We examine specifically their initial and subsequent partnerships with

incumbent firms, assuming that entrants are better embedded if they manage to form partnerships with mainstream or high-status incumbents.

2.2 Initial ties and endorsement

Market entrants benefit from partnerships with incumbent firms (Jensen, 2008). In the entry process, there is substantial uncertainty around their quality, making others hesitated to exchange with them (Stuart *et al.*, 1999). By collaborating with incumbents, entrants leverage the incumbents' legitimacy in the focal market to signal their own credibility as exchange partners (Oliver, 1990). Partnerships with incumbents will hence serve as an endorsement tool that enhances the reputation of entrants. Moreover, by collaborating with incumbents, entrants can gain access to a larger amount of business opportunities, information, and resources (Podolny, 2001), which further enhances their early performance. Whereas market entrants are generally motivated to collaborate with incumbents, incumbents may use collaborative relationships discriminatingly to manage threats from market entrants (Jensen, 2008). We conjecture that mainstream incumbents may be reluctant to collaborate with *de alio* entrants, for at least three main reasons.

First, because *de alio* entrants often carry impure market identities (Khessina and Carroll, 2008; York and Lenox, 2014), collaboration with them may undermine the legitimacy of incumbents in the market. Put differently, partnering with impure *de alio* entrants could "pollute" the identities of mainstream incumbents, so that the incumbents may become less legitimate in the eyes of third parties (e.g. customers and regulators). For instance, when oil companies enter the green energy segment to "greenwash" their images, they threaten to "pollute" the pure identity of the segment (Georgallis *et al.*, 2019), so that green incumbents may be hesitated to collaborate with them. Similarly, when corporates establish their venture capital arms, they project identities that are different from traditional capital investment (Pahnke *et al.*, 2015), such that VC firms may be reluctant to syndicate with them (Hallen et al., 2014).[2]

Second, and relatedly, *de alio* entrants may bring in different industry logics, so that incumbents are less willing to collaborate with them (Jensen, 2008). *De alio* entrants often employ strategies, practices, and norms that are different or even incompatible from mainstream incumbents in the market. For instance, when new CVC firms are established, they usually introduce corporate logics that are very different from the mainstream capital investment logics held by independent VC firms (Pahnke *et al.*, 2015). As a result, such differences and incompatibility may inhibit incumbents from working together with *de alio* entrants (Lane and Lubatkin, 1998). Indeed, this is aligned with our anecdotal evidence. "*I prefer syndicating with IVCs as they will not constrain the independent development of new ventures*," said one of our interviewees from an independent VC firm, "*CVCs often have their own ideas*."

Finally, *de alio* entrants may pose greater competitive threats to mainstream incumbents. When commercial banks entered the investment banking market, for instance, they threatened to flounder incumbents with their universal banking services (Jensen, 2008); when corporates entered the VC market, they threatened to misappropriate new ventures' core technologies, which would ultimately undermine the investment returns of independent VC firms (Pahnke *et al.*, 2015). Facing heightened competitive tension, mainstream incumbents may exclude *de alio* entrants in their networking process, as a way of resistance. In contrast, *de novo* entrants are better able to secure early partnerships with mainstream incumbents, because they introduce less competitive threats. Based on the reasons above, we expect that *de alio* entrants have a general disadvantage in securing initial partnerships with mainstream incumbents, as compared with *de novo* entrants.

H1A: De alio entrants are less likely than de nono entrants to form ***initial collaborations*** *with mainstream incumbents.*

Incumbents are, of course, not homogenous. Markets are commonly depicted as a pyramid such that a few high-status actors account for the vast majority of transactions and prestige. It is important for entrants to form ties with high status and core incumbents, whereas collaborating with peripheral ones makes little contribution. First, because status is an effective market signal of quality that is hard to observe, high-status incumbents are perceived to be of high quality, credibility, and legitimacy (Podolny, 1993). So, forming ties with high-status incumbents is more useful for firms to signal their quality and enhance their status positions (Podolny and Phillips, 1996). It is particularly so for new entrants who lack historical track of performance records (Stuart *et al.*, 1999). Second, high-status

2 Indeed, as Hallen et al. (2014: 1095) quoted from their interviews, "They [VC investors] believe that bringing in a CVC [investor] . . . isn't helpful, because it may give you a label of being in the pocket of the corporation."

incumbents are also favorably positioned at the center to mobilize resources (Sorenson and Stuart, 2001; Hochberg et al., 2007). By collaborating with high-status incumbents, entrants are able to capture more information and resource benefits. As such, whereas we have proposed that mainstream incumbents are generally resistant to *de alio* entrants, it is important to understand whether high-status incumbents will behave differently from low-status incumbents. We expect that *de alio* entrants may actually be better able to secure initial ties with high-status incumbents.

Although *de alio* entrants introduce different logics and pose greater competitive threats, they also have access to resource endowments from their parent organizations (Carroll *et al.*, 1996). The extent to which incumbents are in favor of collaborating with a *de alio* entrant is then dependent on how they weigh the value of its attractive resources *against* the concerns about its competitive threats. We argue that, as compared with low-status incumbents, high-status incumbents are less concerned about the threats of *de alio* entrants, so that they are more likely to collaborate with *de alio* entrants for their attractive resources.

More specifically, *de alio* entrants are less likely to behave opportunistically against high-status incumbents, because they do not want to jeopardize future relationships with prestigious partners (Hallen et al., 2014). Instead, *de alio* entrants are more willing to provide great effort for the collective good when collaborating with high-status incumbents (Castellucci and Ertug, 2010). As such, high-status incumbents are less likely to consider *de alio* entrants as threatening.[3] Moreover, even if collaboration with *de alio* entrants is perceived as less conforming to industry norms, high-status incumbents are more likely to accept it than their low-status peers. Because high-status incumbents feel confident in their social acceptance, they are emboldened to deviate from conventional norms (Phillips and Zuckerman, 2001). As a result, while low-status incumbents may shy away from *de alio* entrants, high-status incumbents are more likely to favor collaboration with *de alio* entrants, which allow them to leverage *de alio* entrants' unique resources to build differentiated competitive advantages. We therefore argue that although *de alio* entrants may face an overall resistance from incumbents, they may have an advantage in securing endorsement from the core.

H1B: De alio entrants are more likely than de novo entrants to form ***initial collaborations*** *with high-status incumbents.*

2.3 Subsequent ties and endorsement

We next discuss whether those initial network differentials will persist over time. First, we argue that *de alio* entrants are more likely to sustain the endorsement from the core. Network dynamics are inertial, such that an actor's future network is highly related to its existing network (Li and Rowley, 2002; Kim *et al.*, 2006). That is because market actors tend to repeat ties with their existing partners, and to establish new ties with the partners of existing partners (Gulati, 1995; Hallen, 2008). If an entrant's initial partners are of high status, it can easily sustain relational endorsement by repeating collaborations with the high-status partners. Meanwhile, its high-status initial partners may introduce their collaborators to the entrant (i.e. the bridging effect; Gulati, 1995). The introduced collaborators are also likely to have high status, according to status homophily that actors engage in collaborations with those of similar status (Podolny, 1994). As such, because of network inertia (both direct and indirect tie effects), *de alio* entrants are more likely to establish ties with high-status incumbents in their subsequent collaborations.

At the same time, forming initial ties with high-status partners signals the quality of an entrant, thereby enhancing its status (Podolny and Phillips, 1996). An entrant's ability to form ties is restricted by its perceived quality (Hallen, 2008). Because new entrants lack performance records, initial ties become an important signal for potential partners to infer the entrants' quality (Stuart *et al.*, 1999). *De alio* entrants with high-status initial partners are perceived to be of high quality, and hence become more attractive to high-status incumbents as collaboration partners. Moreover, ties transfer valuable resources (Podolny, 2001; Sorenson and Stuart, 2001; Hochberg et al., 2007). When forming initial ties with high-status partners, *de alio* entrants receive more valuable resources. The superior resources can

3 Certainly, *de novo* entrants are also less likely to behave opportunistically against high-status incumbents. However, incumbents in the market are generally less concerned about *de novo* entrants who actually follow industrial logics and norms. As such, *de novo* entrants are more readily accepted by incumbents. On the contrary, incumbents are concerned about *de alio* entrants' behavior, which limits their collaboration propensity. Only those incumbents who perceive less threat (e.g. high-status incumbents) would be in favor of collaborations with *de alio* entrants. As such, we expect that the concerns about opportunism matter more, when incumbents decide whether to collaborate with *de alio* entrants.

further enhance the value and attractiveness of the entrants. As such, we argue that *de alio* entrants are more likely to form ties with high-status incumbents at the later time.

Second, we argue that *de alio* entrants will be able to offset the overall initial resistance from the market. Initial collaborations with high-status incumbents enhance the legitimacy of *de alio* entrants as exchange partners to the whole market. This will help mitigate the general concerns among mainstream incumbents about the different logics and competitive threats of *de alio* entrants, thereby reducing the overall relational resistance. As a result, it is no longer more difficult for *de alio* entrants to secure partnerships with mainstream incumbents at the later period. In sum, we posit that because of their initial network positions, *de alio* entrants may be able to sustain their advantages in securing partnerships with high-status incumbents, and at the same time to offset the overall resistance in the market.

H2A: De alio entrants are no longer less likely than de novo entrants to form ***later collaborations*** *with mainstream incumbents.*
H2B: De alio entrants are more likely than de novo entrants to form ***later collaborations*** *with high-status incumbents.*

3. Empirics

3.1 Research context: the venture Capital market

We examined our hypotheses in the venture capital market. Venture capital is a form of equity financing to early-stage companies that are deemed to have high growth. IVCs are the mainstream actors in the market, founded by individual venture capitalists who raise funding from ultimate investors to support entrepreneurs (Gompers and Lerner, 2001; Sahlman, 1990). Venture capital is smart money because IVCs provide entrepreneurs with not only capital but also knowledge. IVCs view themselves as skilled business advisors, being able to help translate entrepreneurs' technical insights into successful businesses (Pahnke *et al.*, 2015). Consistent with this identity, IVCs do the heavy lifting for entrepreneurs, such as team professionalization and strategy formulation (Hallen et al., 2014). IVCs' goal is clearly on direct financial returns: buying low and selling high. The venture capital market in the USA has been expanding since late 1970s when pension funds were allowed to invest (Gompers and Lerner, 2001; Hsu and Kenney, 2005). A great number of IVCs have been established over decades. New IVCs, as *de novo* entrants in the market, usually project a consistent identity of venture capital, as they tend to follow the traditional logics to source, evaluate, nurture, and exit investments.

Although IVCs are the typical actors representing the mainstream logics, many other types of established organizations have entered the market with different identities and logics (Dushnitsky, 2006; Pahnke *et al.*, 2015). In particular, investments from CVCs have proliferated since late 1990s, being triggered by many successful venture investments by large corporates (Gompers and Lerner, 2001). CVC refers to the practice of established corporates taking a minority equity in new ventures (Dushnitsky, 2006). Although CVCs also care about financial returns, the vast majority of CVCs consider strategic goals more important (Dushnitsky and Lenox, 2005; Kim and Park, 2017; Gaba and Dokko, 2016).

As a result, CVCs are fundamentally different from IVCs in terms of identity, logics, norms, and strategies (Souitaris and Zerbinati, 2014; Pahnke *et al.*, 2015). For instance, while IVCs typically prefer IPOs as the most desirable exit choice, CVCs seek to benefit strategically through sourcing novel technologies from ventures (Dushnitsky and Lenox, 2005), which may even delay the ventures' IPOs (Kim and Park, 2017). Although IVCs emphasize substantial authority, speedy decision-making, and deep personal engagement, CVCs are featured with dispersed authority, complex decision-making, and remote control (Pahnke *et al.*, 2015). More than that, CVCs are known as "sharks" who often misappropriate ventures' technologies and use their inside information to duplicate technologies (Katila *et al.*, 2008). Those are completely divergent from the mainstream logics of IVCs.

On the other hand, CVCs provide a wider range of support to entrepreneurs. CVCs give entrepreneurs not only financial capital and professional advice, but also complementary resources that they can mobilize from their parents to support (Park and Steensma, 2013; Chemmanur *et al.*, 2014; Alvarez-Garrido and Dushnitsky, 2016). The parents of CVCs, for instance, can provide ventures with direct technological support, share their customer base with ventures, and facilitate ventures' manufacturing and marketing activities (Kim and Park, 2017). Those functions are usually not available from IVCs.

Overall, CVCs differ substantially from mainstream IVCs (Pahnke *et al.*, 2015). When entering the market, CVC entrants pose greater threats to challenge the traditional industry logics, which may lead to more resistance from IVCs (Hallen et al., 2014: 1095). At the same time, CVC entrants are armed with resource endowments and relational endorsement from their parents (Keil *et al.*, 2010; Souitaris and Zerbinati, 2014: 335), which may be attractive to

IVCs. Whether IVC incumbents are in favor of collaborating with a CVC entrant is then dependent on how they weigh the value of its resources against the concerns about its threats.

Applying our general hypotheses into the VC context, we expect that CVC entrants are less likely to form initial syndication with IVC incumbents.[4] That is because IVC incumbents are generally concerned about CVCs' different logics and competitive threats (e.g. different investment goals, incompatible practices and norms, and the risk of technology misappropriation) (Pahnke *et al.*, 2015; Hallen et al., 2014). For IVC incumbents, those concerns often outweigh the potential benefits of CVCs' corporate resources. However, we also expect that CVC entrants are more likely to secure initial syndication with high-status incumbents. High-status IVCs are less concerned about the threats of CVCs because of their powerful market positions[5] (Hallen *et al.*, 2014). Indeed, Hallen *et al.* (2014) suggest that high-status IVCs who have greater power in the market are more able to discipline the behavior of CVCs, so that CVCs are less likely to misappropriate technologies or misguide the development courses for their individualistic goals. As such, for high-status incumbents, the benefits from collaborating with CVC entrants may outweigh the perceived risks.[6]

3.2 Data

We collected data about venture capital investments from the ThomsonOne database. The database provides quite complete information about venture financing in the USA and has been widely used to analyze the venture capital market and CVC investments (Hallen et al., 2014; Pollock *et al.*, 2015). We traced transactions in the USA from 1990 to 2014, spanning both the emergence and maturity periods of CVC investments. In earlier years, CVCs had waxed and waned with seemingly little reason, so IVCs were quite unreceptive to CVCs. As the VC market got crowded in the late 1990s, the VC community became less unwilling to work with CVCs (Gompers and Lerner, 2001).

We included both USA and foreign VC firms to make our analysis more complete (Hallen et al., 2014). Since we constructed key network measures using 3-year moving windows, our sample started from 1993. We focused on all VC firms whose founding dates were in 1993 or later, to ensure that they were new entrants. There were several firms in the database who had made investments before their recorded founding years. In order to avoid missing their first investment syndication, we required that all sample firms made no investment before 1993. That is, we removed those firms whose founding dates were in 1993 or later but had investments between 1990 and 1992.[7] Because we focused on comparing CVC (*de alio*) and IVC entrants (*de novo*), we removed the other types of VC entrants (e.g. bank-affiliated VCs) (Dushnitsky and Shapira, 2010; Chemmanur *et al.*, 2014).

4 Syndication is a typical form of collaborations among venture capital firms. We assume that CVC entrants are less embedded when they are less likely to form syndication partnerships with IVC incumbents. This can happen either because CVC entrants are not invited by IVC incumbents (i.e. a passive mechanism) or because they are not able to invite IVC incumbents to join their investments (i.e. an active mechanism). In this study, we do not pay much attention to distinguishing the two mechanisms, as we see both will indicate that IVC incumbents are less reluctant to collaborate with CVC entrants. Future studies may focus on the distinctions. We thank one reviewer for raising this issue.

5 IVCs are generally concerned about collaborating with CVCs, because it may be perceived as disconfirming behavior. See the quote from Hallen et al. (2014) in our Footnote 2.

6 There is one important underlying assumption worth noting. We assume that CVC entrants tend to syndicate with IVC incumbents, so that syndication outcome is based on the availability of IVC partners, rather than the deliberate choice of CVC entrants. Although certainly different CVC entrants may have their individual preferences for syndication, we believe that most of them are eager to collaborate with IVCs, because of the importance of syndication networks in this setting (Sorensen and Stuart, 2001; Hochberg *et al.*, 2007). Indeed, Souitaris and Zerbinati conclude in their extensive qualitative study (p. 2014) that "CVCs. . .prefer to syndicate with independent VCs. All six programs of our 'early' dataset indicated that collaboration with VCs was crucial."

7 More precisely, 74 firms (about 2.5%) were removed from the sample because of this constraint, of which 61 were IVCs and 13 were CVCs. For example, in the database, the VC firm BioCapital was founded in 2000, but its first investment was recorded in 1992 in the company Unisyn Technologies.

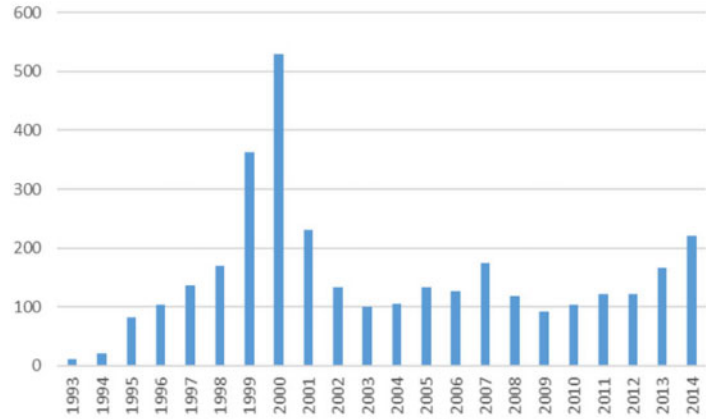

Figure 1. New entrants across years.

The final sample included 3368 new VC firms, of which 564 are CVCs. Their distribution across years was shown in Figure 1. It is not surprising that the number of entrants peaked around year 2000 during the dotcom bubbles. For each of the sampled firms, we identified their *first syndicated* investments and analyzed the status of their initial partners. That is, we focused on their very first set of partners (Hallen, 2008). The primary sample therefore included one observation for each new VC (i.e. their first syndicated investments).[8]

3.3 Dependent variables

3.3.1 Initial IVCP ratio

It was calculated as the number of IVC partners divided by the total number of partners in an entrant's first syndication. It ranged from 0 to 1. A larger value indicated that the entrant was more likely to form initial partnerships with IVC incumbents (i.e. the mainstream actors in the market). In other words, we expected a larger *initial IVC ratio* if an entrant was well accepted by mainstream IVC incumbents.[9] This ratio measure was scaled by syndication size, so that it could better indicate acceptability by the market. We did not use the absolute count number of partners, because it might represent a selective collaboration behavior of entrants, rather than acceptability.

3.3.2 Initial status

Following previous studies (Podolny, 2001; Pollock *et al.*, 2015), we used syndication network centrality to measure the status of VCs. In a syndication matrix in year *t*, a cell connecting firms i and j contained the number of investments (C_{ijt}) that the two firms had co-invested during the past 3 years.[10] We calculated Bonacich centrality using UCINET (Borgatti *et al.*, 2002):

8 There are a few cases (27 firms or 0.8%: 6 CVCs and 21 IVCs) that a VC firm made several investments on its first investment date. This makes it impossible to control for investment-level features (e.g. location, industry), since those features cannot be added or averaged. So we removed such observations for conservativeness. Nevertheless, we included those observations and excluded investment-level controls in an unreported analysis, and found similar results.

9 In line with Hallen's (2008) design, we focused on the very first set of syndication partners, as a conservative measure of "initial" partnerships. A firm's first deal is important, as it substantially shapes the firm's later transactions. In an unreported analysis, we relaxed the constraint and considered all syndications in the first year. Results were highly consistent.

10 We used 3-year moving windows to construct preexisting networks. Three-year windows were commonly employed in the network research (Fleming *et al.*, 2007; McFadyen *et al.*, 2009), though alternative windows (1- or 5-year) were also used in prior studies. In constructing the preexisting networks, we included all types of VC firms to make our coverage

$$S(\alpha, \beta) = \alpha \sum_{k=0}^{\infty} \beta^k R^{k+1} I,$$

where α was a scaling factor that normalized status scores, β was the weighting factor reflecting how much the status of a VC depended on the status of its partners, R was the matrix for syndication network, and I was a column vector of ones. We used the default setting in UCINET where β was set as 0.995.[11] We normalized the measure to a range between 0 and 1 to make it comparable across networks (Podolny, 2001). Based on that, *Initial partners' status* was measured as the average status of a firm's first syndication partners.[12] We also introduced a measure of *initial IVCP's status* as the average status of only IVC partners. Although the former measure covered all types of initial partners, the latter one allowed us to see if an entrant secured endorsements from high-status mainstream partners.

3.3.3 Later IVCP ratio

We tracked a VC firm's all syndication partners in the 3 years after its first investment.[13] For example, if a firm made its first investment in 1995, we identified all partners with whom the firm syndicated between 1996 and 1998. *Later IVC ratio* was calculated as the number of an entrant's IVC partners divided by the total number of partners during the 3-year window.

3.3.4 Later partners' status

We calculated it as the weighted average status of an entrant's partners over the subsequent 3 years:

$$\text{Laterpartners'status}_i = \sum_{j=1}^{n} (S_j \times w_j)$$

where S_j was the status of partner j, and w_j was the weight of j that equaled the number of ties between i and j divided by the total number of ties formed by i in the 3 years. Weighting is necessary because frequent partners' status is more informative for the focal firm's embeddedness. Similarly, we also calculated *later IVCP's status* as the weighted average status of only its IVC partners over the subsequent 3 years.

3.4 Independent variable

The key explanatory variable was *CVC* entrants, using IVC entrants as the comparison group. We differentiated the identities of VC firms according to the ThomsonOne's categorization (Dushnitsky and Shapira, 2010). It was coded as 1 if a VC firm was categorized as "Corporate PE/Venture," and coded as 0 if categorized as "Private Equity Firm."

3.5 Control variables

In predicting initial partnerships, we controlled for a set of variables. First, while we focused on their first syndicates, VC firms' very first investments were not necessarily syndicated. The nonsyndicated investments did not allow us to observe their partner portfolios and initial partners' status. Out of 3368 VC firms, there are 739 VC firms (654 IVCs and 85 CVCs) whose first investments were nonsyndicated. In such cases, we moved to their later investments when first syndication occurred. To account for any potential bias due to this operationalization, we added a dummy

more comprehensive. Building networks with only CVCs and IVCs would ignore their links through other types of VC firms, thus leading to biased measures.

11 A larger value indicates a stronger status transfer effect: The status of a VC is more dependent on the status of its partners. See more discussions in Bothner *et al.* (2010).

12 In an unreported analysis, we used the highest status of partners in the focal round as an alternative dependent variable (Hallen *et al.*, 2014) and found similar results. Moreover, while we focused on entrants' initial and later partner portfolios, it is also possible to employ a more flexible dyad-level design and investigate the dyadic matching between entrants and incumbents (Jensen, 2008).

13 Although the 3 years window is an arbitrary choice, this is arguably the most critical period for market entrants as a formative period, because organizational routines and culture formed at this period are likely to have a long-lasting imprinting effect (Kim and Park, 2017). Nevertheless, the results stayed consistent when we used 2 and 4 years moving windows.

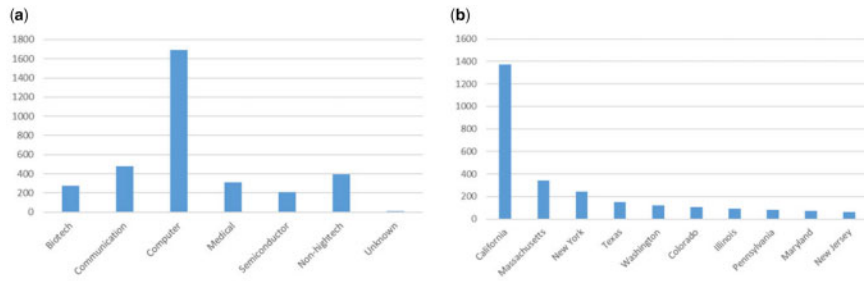

Figure 2. (A) Investment distribution across industries. (B) Investment distribution across regions.

variable, *first investment*, with a value of 1 when first investment was syndicated, and 0 otherwise. Second, because high-status VCs prefer less uncertain market niches (Podolny, 2001), we controlled for the uncertainty of investments using both *round number* and *stage dummies* (i.e. *Seed, Early, Expansion*, and *Later*).[14] Third, investments were heterogeneous in their industries (Katila *et al.*, 2008), so we added six industry dummies according to ThomsonOne's VE major industry categorization (i.e. *Biotech, Semiconductor, Medical, Computer, Communication*, and *Non-high-tech*) (Hochberg *et al.*, 2015).[15] *Syndication size* was controlled for to rule out the possibility that partners' status was correlated with the size of syndication. We added a dummy variable, *same state*, to indicate whether a VC firm was located in the same state as its investment. Finally, we included both location and year fixed-effects for VC firms to account for any spatial and temporal variance. Figure 2A shows the distribution of investments across major industries, whereas Figure 2B depicts the distribution across regions (only top ten regions in the USA). Not surprisingly, investments were concentrated in California and in the computer-related sectors.

In predicting later partnerships, we were able to control for more factors because information about their investment histories became available. First, we controlled for the *number of deals* that VC firms had made in the 3 years. Second, we added the specialization of VC firms' investments in terms of industries, locations, and stages, using the Herfindahl–Hirschman Index (*HHI*) of investments (Hochberg *et al.*, 2015). Specifically, we calculated industry specialization according to the major VE industry dummies, location specialization according to states in the USA, and stage specialization according to stage dummies. Third, we included *average syndication size*, measured as the total number of syndication ties divided by the number of deals. Fourth, we controlled for the industry and stage dummies of their first syndications. We also added *first investment* and *initial IVCP ratio*, reflecting the features of their very first syndication. Finally, we included both location and year fixed-effects for VC firms to account for any spatial and temporal variance.

4. Analysis and results

4.1 Predicting initial partnerships

Nonindependence was not a concern since there was one observation for each firm. However, only a small fraction of firms in the sample were CVCs, which might be not randomly distributed. To address this issue, we used the CEM (coarsened exact matching) approach. This method, widely used in recent studies (Rogan and Sorenson, 2014; Bowers and Prato, 2018; Li *et al.*, 2017), helped improve the estimation of causal effects by reducing imbalance in the covariates between treated (i.e. CVC entrants) and control (i.e. IVC entrants) groups (Blackwell *et al.*, 2009). CEM was preferred over other matching methods for its advantage of reducing "model dependence, estimation error, bias, variance, mean square error, and other criteria" (Iacus *et al.*, 2012: 2). It automatically coarsened the data based on a binning algorithm that assigned observations to different strata according to the matching variables specified *ex ante* (Bowers and Prato, 2018).

14 Other stage and Buyout stage were used as the comparison group, because we were more interested in the coefficients for the other stages (i.e. Seed, Early, Expansion, and Later), which were the key focus of venture capital investments. Removing the investments at other or buyout stages, which take a small fraction, provided consistent results.

15 Industry Unknown was used as the comparison group.

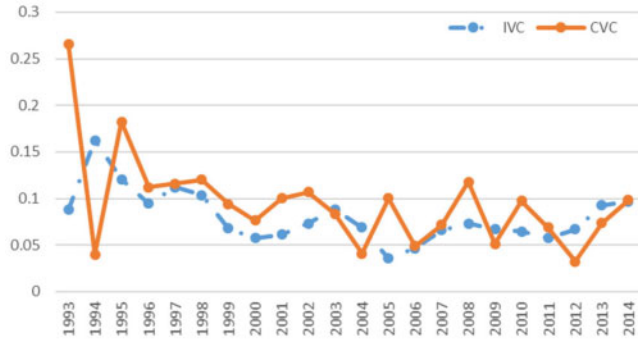

Figure 3. Initial partners' status of CVCs and IVCs.

Specifying matching variables involved a tradeoff (Rogan and Sorenson, 2014). On the one hand, coarser matching reduced the value of matching but increased the number of available matches. Finer-grained matching, on the other hand, reduced the number of equivalent matches but better accounted for heterogeneity. We matched observations according to their location and entry year. The temporal and spatial dimensions collectively defined the essential market conditions for treated and control firms.[16] Given that CEM dropped observations without an accepted match, our matched sample included 2958 observations, of which 555 are CVCs. After conducting CEM, we implemented stratum fixed-effects regressions, thus estimating variances within each matched stratum (Rogan and Sorenson, 2014). To account for differential strata sizes, we used weighted regressions based on weights created by CEM algorithm. We included all the control variables except firm location and year dummies that were used in the first-step matching. The descriptive statistics for the CEM sample are presented in Table 1. Regression results are shown in Table 2.

H1A: Models 1 and 2 predict initial IVCP ratio. In model 2, the coefficient for CVC is significant and negative ($\beta = -0.077$, SE = 0.016). It suggests that CVC entrants are less likely to form initial partnerships with IVC incumbents. More specifically, in their initial collaborations, CVC entrants have about 8% fewer IVC partners than IVC entrants (more than 10% of the mean of initial IVC ratio in the sample). In models 3 and 4, we replaced the dependent variable with a dichotomous measure, which has a value of 1 if initial syndication had at least one IVC partner, and 0 otherwise. This measure helped remove the confounding effect of syndication size. We then employed logit regressions to estimate whether any IVC partners were included in a syndicate. Results in model 4 show a negative effect of CVC ($\beta = -0.743$, SE = 0.177). Hypothesis 1A is thus supported that de alio entrants are less likely than de novo entrants to form initial ties with mainstream incumbents.

H1B: Models 5 and 6 predict initial partners' status. The coefficient for CVC is significant and positive ($\beta = 0.013$, SE = 0.005). It suggests that initial partners' status of CVC entrants is about 0.013 higher than that of IVC entrants (over 15% of the mean of initial partners' status in the sample). The results are similar in model 7, where initial IVCP's status is the dependent variable. A positive effect of CVC ($\beta = 0.020$, SE = 0.006) suggests that de alio entrants can secure more endorsement from high-status IVC firms. Our Hypothesis 1B is thus supported that de alio entrants are more likely than de novo entrants to form initial collaborations with high-status incumbents. To see how the effect varies over time, we depict the mean of initial partners' status across different years in Figure 3. Although CVCs' initial partners had higher status than IVCs' initial partners in most of the years, there were also some years when IVCs gained more initial endorsement (e.g. 1994 and 2012).

4.2 Predicting later partnerships

Not all firms above were included in the analysis of subsequent partnerships. First, because we used a 3-year window, firms founded in 2012–2014 were removed automatically since they existed for <3 years in 2014. Second, some firms were excluded when they made no investments over the following 3 years, even though they entered the market

16 We were unable to account for any performance or historical activities, since we were analyzing their very first syndicated investments.

Table 1. Descriptive statistics for initial partners

	Variables	*N*	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Initial IVCP ratio	2958	0.72	0.34	0.00	1.00	1.00																	
2	Initial partners' status	2958	0.08	0.12	0.00	1.00	0.10	1.00																
3	Initial IVCP's status	2618	0.09	0.13	0.00	1.00	0.00	0.92	1.00															
4	CVC	2958	0.19	0.39	0.00	1.00	0.06	−0.10	0.08	1.00														
5	Syndication size	2958	3.06	2.48	1.00	18.00	0.11	−0.06	0.12	0.17	1.00													
6	Round number	2958	2.55	2.05	1.00	16.00	0.12	0.03	0.15	0.06	0.33	1.00												
7	Same state	2958	0.33	0.47	0.00	1.00	0.05	0.04	0.05	−0.07	−0.05	−0.10	1.00											
8	First investment	2958	0.79	0.41	0.00	1.00	0.05	0.01	0.06	0.08	0.11	0.01	−0.05	1.00										
9	Seed stage	2958	0.08	0.27	0.00	1.00	0.03	0.01	0.04	−0.03	−0.12	−0.18	0.07	0.03	1.00									
10	Early stage	2958	0.35	0.48	0.00	1.00	−0.04	0.05	−0.05	−0.04	−0.17	−0.33	0.07	0.00	−0.21	1.00								
11	Expansion stage	2958	0.37	0.48	0.00	1.00	0.01	−0.04	−0.01	0.02	0.10	0.11	−0.04	0.00	−0.22	−0.57	1.00							
12	Later stage	2958	0.16	0.37	0.00	1.00	0.02	−0.01	0.03	0.03	0.21	0.37	−0.07	0.01	−0.13	−0.33	−0.34	1.00						
13	Biotech	2958	0.08	0.27	0.00	1.00	0.06	0.04	0.07	−0.01	0.11	0.12	−0.04	0.02	0.01	0.01	−0.05	0.03	1.00					
14	Communication	2958	0.15	0.36	0.00	1.00	0.06	−0.01	0.06	0.07	0.12	0.01	−0.02	0.05	0.03	−0.06	0.05	0.00	−0.12	1.00				
15	Computer	2958	0.51	0.50	0.00	1.00	−0.02	0.00	−0.02	−0.01	−0.12	−0.12	0.07	−0.03	−0.01	0.09	0.02	−0.11	−0.29	−0.43	1.00			
16	Medical	2958	0.08	0.28	0.00	1.00	−0.01	0.05	−0.02	−0.05	0.04	0.10	−0.07	0.02	0.03	−0.01	−0.06	0.06	−0.09	−0.13	−0.31	1.00		
17	Semiconductor	2958	0.07	0.25	0.00	1.00	−0.02	−0.02	−0.02	0.03	0.02	0.02	0.04	−0.02	−0.03	−0.01	0.02	0.02	−0.08	−0.11	−0.27	−0.08	1.00	
18	Non-hightech	2958	0.11	0.31	0.00	1.00	−0.06	−0.03	−0.05	−0.04	−0.09	−0.03	−0.03	−0.03	−0.02	−0.07	−0.01	0.08	−0.10	−0.15	−0.36	−0.11	−0.09	1.00

Table 2. Predicting initial partnerships

	Model 1	Model 2	Model 3	Model 4 CEM sample	Model 5	Model 6	Model 7
Variables	Initial IVCP ratio		Initial IVCP		Initial partners' status		IVCP's status
CVC		−0.077 (0.016)*****		−0.743 (0.177)****		0.013 (0.005)**	0.020 (0.006)***
Syndication size	−0.011 (0.003)****	−0.009 (0.003)***	1.110 (0.091)****	1.140 (0.092)****	0.003 (0.001)***	0.003 (0.001)***	0.003 (0.001)***
Round number	0.011 (0.004)***	0.011 (0.004)***	0.045 (0.044)	0.053 (0.044)	0.006 (0.001)****	0.006 (0.001)****	0.009 (0.001)****
Same state	0.003 (0.016)	−0.003 (0.016)	−0.048 (0.173)	−0.095 (0.175)	0.008 (0.005)	0.009 (0.005)*	0.014 (0.006)**
First investment	0.004 (0.016)	0.010 (0.016)	0.191 (0.154)	0.254 (0.155)	0.007 (0.005)	0.006 (0.005)	0.010 (0.006)*
Constant	0.675 (0.188)****	0.688 (0.188)****	−2.328 (1.026)**	−2.165 (1.034)**	0.025 (0.063)	0.023 (0.063)	0.046 (0.073)
Year fixed-effects	No	No	No	No	No	No	No
Firm location fixed-effects	No	No	No	No	No	No	No
Initial company stage fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initial company VE industry fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matching stratrum fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2958	2958	2649	2649	2958	2958	2615
R^2	0.087	0.094	0.242	0.25	0.136	0.138	0.183

Standard errors in parentheses; Models 3 and 4 use logit regresssions, so their R^2 is pseudo. ****$P < 0.001$, ***$P < 0.01$, **$P < 0.05$, *$P < 0.10$.

before 2012. However, the latter situation may lead to survival bias, as we were only able to observe those entrants who survived in the subsequent 3 years. To address this potential issue, we used a Heckman two-stage model, though we found similar results from simple regressions without such corrections. Specifically, we used two industry dummies, *biotech* and *semiconductor*, as instruments. Appropriate instruments should directly predict the likelihood of surviving over the subsequent years (i.e. first-stage outcomes), but do not have a direct effect on VC firms' later partnerships. The two industries fit well. They were hot for venture capital investments, so VC firms who made their initial investments in the two industries were more likely to keep active in the market. However, the two industry dummies are less likely to be determining factors for the composition of later syndication. Empirically, we found that both dummies have a significant, positive effect on the first-stage selection (Biotech: $\beta = 1.215$, SE = 0.573; Semiconductor: $\beta = 0.947$; SE = 0.574), but no significant effects in the second-stage estimation (Biotech: $\beta = 0.005$, SE = 0.064; Semiconductor: $\beta = -0.019$; SE = 0.064). Based on the results of first-stage Probit regression (in Appendix), we calculated Mills ratio and included it in second-stage models. Some observations were excluded automatically in Probit regressions because their location dummies predicted failure perfectly. At the end, we obtained Mills ratio for 1956 firms.[17] We then used the CEM method to test our hypotheses. The descriptive statistics are presented in Table 3. Regression results are shown in Table 4.

H2A: Models 8–11 predict later IVCP ratio. The coefficient for CVC in model 9 is nonsignificant, albeit negative ($\beta = -0.025$, SE = 0.016). Comparing to the results in model 2 predicting initial IVCP ratio, we may conclude that CVC entrants are less resisted by IVC incumbents at the later time. This is consistent with our Hypothesis 2A that the overall disadvantage of de alio entrants in securing partnerships with mainstream incumbents is offset in later collaboration.

We further explore what helps offset the disadvantage. We argued above that initial ties with high-status incumbents would make *de alio* entrants more appealing to mainstream incumbents. To examine this argument, we added *initial partners' status* in model 10 and *initial IVCP's status* in model 11. Although the former is non-significant, the latter is significant and positive ($\beta = 0.090$, SE = 0.041). This simple test suggests that securing initial partnerships with high-status *mainstream* incumbents is helpful for *de alio* entrants to offset the overall collaboration resistance. However, the role of other types of high-status incumbents is not significant.

H2B: Models 12–14 predict later partners' status. The main effect of CVC is significant and positive in model 13 ($\beta = 0.019$, SE = 0.007). It means that later partners' status of CVC entrants is about 0.019 higher than that of IVC entrants (over 18% of the mean of later partners' status). Hypothesis 2B is thus supported that de alio entrants are more likely than de novo entrants to form later collaborations with high-status partners. That is, the advantage of de alio entrants in securing endorsement from the core is sustained.

However, after adding *initial partners' status* in model 14, both the effect size and statistical significance of CVC decrease, whereas the effect of *initial partners' status* is significantly positive. It suggests that CVC entrants can secure later network advantages, largely because of their initial network advantages in the entry period. The results are similar in models 15 and 16 predicting *later IVCP's status*. The coefficient for CVC is significant and positive in model 15. Its effect size decreases from 0.024 to 0.013 after adding *initial IVCP's status* in model 16.

4.3 Round-level analysis

To further explore the data, we conducted a set of round-level analyses. Each observation is a unique investment round that the focal VC participated over the subsequent 3-year window. There are two possible mechanisms for how initial network advantages help secure later advantages. On the one hand, because of network inertia, an entrant's high-status initial partners may introduce their own collaborators to the entrant. If this were the case, the entrant would collaborate with more actors who were local to its initial network position. On the other hand, because of the endorsement effect, high-status initial partners make an entrant more attractive as exchange partners to all actors in the market. If so, the entrant would also secure more collaborations distant from its initial position.

17 Among VC firms included in the sample for later partnerships (i.e. 1956 firms), about 15.3% were CVCs and the average status of their initial partners was 0.081. Among VC firms excluded in the later analysis (i.e. 1412 firms), about 18.6% were CVCs and the average status of their initial partners was 0.071. That is, CVC entrants and entrants with less prestigious initial partners were slightly more likely to be excluded.

Table 3. Descriptive statistics for later partners

Variables	*N*	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Later IVCP ratio	1618	0.74	0.21	0.00	1.00	1.00																						
Later partners' status	1618	0.11	0.10	0.00	1.00	−0.01	1.00																					
Later IVCP's status	1585	0.09	0.08	0.00	0.71	0.23	0.86	1.00																				
CVC	1618	0.18	0.38	0.00	1.00	−0.14	0.06	0.04	1.00																			
Initial partners' status	1618	0.09	0.12	0.00	1.00	−0.01	0.24	0.24	0.08	1.00																		
Initial IVCP's status	1451	0.09	0.13	0.00	1.00	−0.04	0.27	0.26	0.11	0.91	1.00																	
Initial IVCP ratio	1618	0.73	0.33	0.00	1.00	0.22	0.08	0.09	−0.06	0.09	−0.01	1.00																
Average syndication size	1618	2.58	1.87	0.08	16.00	−0.14	0.10	0.05	0.22	0.03	0.03	−0.09	1.00															
Industry HHI	1618	0.67	0.26	0.19	1.00	−0.02	−0.05	−0.02	0.11	−0.08	−0.08	−0.03	0.17	1.00														
Stage HHI	1618	0.60	0.25	0.25	1.00	−0.05	−0.08	−0.06	0.08	−0.09	−0.07	−0.07	0.28	0.56	1.00													
State HHI	1618	0.63	0.30	0.08	1.00	0.06	−0.08	−0.03	−0.01	−0.06	−0.05	−0.03	0.12	0.49	0.52	1.00												
Number of deals (ln)	1618	1.70	1.15	0.00	5.26	0.06	0.19	0.18	−0.12	0.13	0.14	0.09	−0.33	−0.58	−0.72	−0.58	1.00											
Seed stage	1618	0.10	0.29	0.00	1.00	0.03	−0.01	0.02	−0.02	0.00	0.03	0.00	−0.08	0.02	−0.03	0.02	0.06	1.00										
Early stage	1618	0.33	0.47	0.00	1.00	0.03	−0.02	0.00	−0.06	−0.07	−0.09	0.08	−0.03	0.04	0.01	0.03	−0.01	−0.23	1.00									
Expansion stage	1618	0.39	0.49	0.00	1.00	−0.04	−0.01	−0.04	0.02	0.03	0.02	−0.04	0.05	−0.06	−0.02	−0.03	0.00	−0.26	−0.56	1.00								
Later stage	1618	0.16	0.36	0.00	1.00	0.00	0.02	0.03	0.08	0.02	0.05	−0.05	0.03	0.02	0.05	0.02	−0.06	−0.14	−0.30	−0.35	1.00							
Communication	1618	0.17	0.38	0.00	1.00	−0.04	−0.01	−0.04	0.06	0.07	0.07	0.03	0.07	−0.04	−0.01	0.00	−0.01	0.04	−0.04	0.01	0.00	1.00						
Computer	1618	0.48	0.50	0.00	1.00	−0.02	0.01	−0.01	0.01	−0.07	−0.06	−0.03	−0.06	0.09	0.00	0.03	0.03	0.00	0.04	0.07	−0.11	−0.44	1.00					
Medical	1618	0.08	0.27	0.00	1.00	0.01	0.03	0.01	−0.03	0.03	0.01	0.08	0.02	−0.04	−0.03	−0.05	0.01	0.02	0.01	−0.07	0.04	−0.13	−0.29	1.00				
Non-hightech	1618	0.10	0.30	0.00	1.00	0.01	−0.07	−0.06	−0.06	−0.05	−0.04	−0.05	−0.11	−0.02	0.01	−0.01	−0.02	−0.04	−0.04	−0.02	0.07	−0.15	−0.32	−0.10	1.00			
First investment	1618	0.78	0.42	0.00	1.00	−0.01	0.08	0.08	0.10	0.07	0.07	0.00	0.17	0.11	0.12	0.08	−0.12	0.03	−0.05	0.03	0.03	0.06	−0.03	0.04	−0.04	1.00		
Mills ratio	1618	0.44	0.22	0.02	1.62	−0.03	−0.20	−0.13	0.31	−0.21	−0.24	−0.09	0.07	0.22	0.27	0.15	−0.36	−0.22	−0.06	−0.01	0.21	0.04	−0.04	0.02	0.16	0.02	1.00	

Table 4. Predicting later partnerships

Variables	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
		Later IVCP ratio				Later partners' status		Later IVCP's status	
CVC		−0.025	−0.025	−0.020		0.019	0.010	0.024	0.013
		(0.016)	(0.016)	(0.017)		(0.007)***	(0.007)	(0.006)****	(0.006)**
Initial partners' status			0.000				0.123		
			(0.046)				(0.021)****		
Initial IVCP's status				0.090					0.132
				(0.041)**					(0.016)****
Initial IVCP ratio	0.102	0.102	0.102	0.116	0.013	0.012	0.009	0.012	0.014
	(0.015)****	(0.015)****	(0.015)****	(0.023)****	(0.007)*	(0.007)*	(0.007)	(0.006)**	(0.009)
Average syndication size	0.013	0.014	0.014	0.023	0.011	0.010	0.010	0.011	0.014
	(0.012)	(0.012)	(0.012)	(0.013)*	(0.006)*	(0.006)*	(0.006)*	(0.005)**	(0.005)***
First investment	−0.009	−0.008	−0.008	−0.012	0.008	0.007	0.007	0.006	0.005
	(0.003)***	(0.003)***	(0.003)***	(0.003)****	(0.001)****	(0.001)****	(0.001)****	(0.001)****	(0.001)****
Number of deals	0.012	0.012	0.012	0.010	0.019	0.020	0.018	0.020	0.019
(ln)	(0.008)	(0.008)	(0.008)	(0.008)	(0.003)****	(0.003)****	(0.003)****	(0.003)****	(0.003)****
Industry HHI	−0.044	−0.039	−0.039	−0.048	0.017	0.014	0.015	0.004	0.005
	(0.025)*	(0.026)	(0.026)	(0.026)*	(0.012)	(0.012)	(0.012)	(0.009)	(0.010)
Stage HHI	−0.006	−0.008	−0.008	0.007	0.035	0.037	0.034	0.021	0.025
	(0.031)	(0.031)	(0.031)	(0.032)	(0.014)**	(0.014)***	(0.014)**	(0.011)*	(0.012)**
State HHI	0.088	0.084	0.084	0.087	0.003	0.006	0.003	0.022	0.016
	(0.022)****	(0.022)****	(0.022)****	(0.022)****	(0.010)	(0.010)	(0.010)	(0.008)***	(0.009)*
Mills ratio	−0.157	−0.114	−0.114	−0.154	−0.037	−0.071	−0.041	−0.076	−0.043
	(0.037)****	(0.047)**	(0.048)**	(0.050)***	(0.017)**	(0.021)****	(0.022)*	(0.017)****	(0.019)**
Constant	0.924	0.901	0.901	0.863	0.109	0.127	0.107	0.133	0.094
	(0.095)****	(0.096)****	(0.096)****	(0.096)****	(0.044)**	(0.044)***	(0.044)**	(0.035)****	(0.037)**
Initial company stage fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initial company industry fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matching stratrum fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1618	1618	1618	1,451	1618	1618	1618	1,585	1,426
R-squared	0.176	0.178	0.178	0.204	0.273	0.277	0.293	0.257	0.292

Standard errors in parentheses. Industry fixed-effects exclude the dummies for semiconductor and biotechnology industries, which were used as instruments in the first stage. ****$P < 0.001$, ***$P < 0.01$, **$P < 0.05$, *$P < 0.10$.

Table 5. Round-level panel regressions on later partnerships

Variables	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
	Local IVCP ratio		Distant IVCP ratio		Local status		Distant status	
CVC	0.045	0.012	−0.092	−0.068	0.031	0.025	−0.004	0.001
	(0.015)***	(0.015)	(0.014)****	(0.014)****	(0.010)***	(0.009)***	(0.003)	(0.003)
Initial IVCP's status		0.562		−0.499		0.228		−0.083
		(0.052)****		(0.049)****		(0.032)****		(0.010)****
Initial IVCP ratio	0.162	−0.001	−0.043	0.113	0.014	0.016	−0.003	0.019
	(0.015)****	(0.024)	(0.018)**	(0.025)****	(0.015)	(0.016)	(0.005)	(0.006)***
Syndication size	−0.006	−0.006	−0.003	−0.003	0.005	0.005	0.003	0.003
	(0.001)****	(0.001)****	(0.001)***	(0.001)***	(0.001)****	(0.001)****	(0.000)****	(0.000)****
Round number	0.017	0.018	−0.016	−0.017	0.002	0.001	0.001	0.001
	(0.001)****	(0.002)****	(0.002)****	(0.002)****	(0.001)	(0.001)	(0.000)*	(0.000)
Constant	0.570	0.693	0.420	0.286	0.141	0.125	0.059	0.052
	(0.122)****	(0.127)****	(0.108)****	(0.109)***	(0.107)	(0.099)	(0.028)**	(0.030)*
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm location fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cmpany VE industry fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firms	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,091	14,701	16,091	14,701	9,009	8,609	13,519	12,230
Robust standard errors in parentheses								

****$P < 0.001$, ***$P < 0.01$, **$P < 0.05$, *$P < 0.10$.

Trying to tease them apart, we distinguished local partners from distant partners. We defined partners as local if they were partners of an entrant's initial partners. That is, local partners were only one-step away from the entrant's initial network, whereas distant partners required two or more steps to reach. Based on that, we calculated the following two variables for each investment round: *local IVCP ratio* and *distant IVCP ratio* (measured as the number of local IVC partners and the number of distant IVC partners divided by the total number of partners, respectively). We ran random-effects GLS regressions with standard errors clustered by firms. Results are reported in models 17–20 in Table 5. The effect of CVC is positive on *local IVCP ratio* in model 17 ($\beta = 0.045$, SE = 0.015), but negative on *distant IVCP ratio* in model 19 ($\beta = -0.092$, SE = 0.014). This suggests that CVC entrants are more likely to secure collaborations with *mainstream* partners who are local to their initial network positions, but are unable to attract those who are distant in their networks. Those effects are substantially reduced after we added *initial IVCP's status* in models 16 and 18, suggesting that initial network positions play an important role in shaping future networks.

We also estimated local status (i.e. the average status of local partners) and distant status (i.e. the average status of distant partners), and reported results in models 21–24. The effect of CVC is positive on *local status* in model 21 ($\beta = 0.031$, SE = 0.010), but nonsignificant on *distant status* in model 23 ($\beta = -0.004$, SE = 0.003). It means that while CVC entrants have advantages to secure endorsements from partners who are local in their initial network positions, they do not have such advantages when partners are distant. Overall, the round-level analyses show a consistent pattern that later network advantages of CVC entrants are mainly in the vicinity of their initial network positions.

4.4 Supplementary analyses

We also extended our main analysis in several ways. First, we used propensity score matching (Chemmanur *et al.*, 2014) and inverse probability of treatment weighting (Gaba and Dokko, 2016), instead of CEM, to estimate the effect of CVC. Our results were robust to both estimation approaches.

Second, although we used high-status members and core members interchangeable in theorizing, they are not completely convergent. Although all VC firms in the core are of high centrality or status, the reverse is not necessarily true because "not every set of central actors forms a core. . ." (Borgatti and Everett, 2000). Therefore, instead of using Bonacich centrality to measure partners' status, we employed their algorithm (Borgatti and Everett, 2000) to measure the extent to which partners were core in the network (Dahlander and Frederiksen, 2012). We found very similar results after replacing Bonacich centrality with coreness measure.

Third, we analyzed if there was any temporal variance for the effect of CVC. The CVC practice became mature by the early 2000s (Gompers and Lerner, 2001), after which the unique identity and logics of CVCs may be less threatening to the VC market. Therefore, we restricted our sample to only entrants before 2000, and found consistent results. Nevertheless, finer-grained analysis is needed to explain the temporal heterogeneity in Figure 3.

Finally, foreign entrants in the US market were included above to make our analysis more complete (Hallen et al., 2014). However, foreign VCs encountered not only the liability of newness, but also the liability of foreignness. To rule out the confounding effect of foreignness, we removed foreign entrants from our analyses. We found results consistent in a subsample of VC entrants based in the USA.

5. Discussion

This study draws attention to the embedding process of market entrants, and compares *de alio* entrants with *de novo* entrants. We focus on their initial partnerships, emphasizing that entrants are better embedded in the market if they can establish initial ties with more mainstream incumbents or prestigious incumbents. Using a sample of market entrants in the venture capital context, we find that while *de alio* entrants face an overall initial relational resistance (i.e. less likely to form partnerships with mainstream incumbents), they are in fact more likely to form initial ties with *high-status* incumbents.[18] We continue to analyze whether initial network differentials persist between *de alio*

18 Although we found that *de alio* entrants *on average* gained initial network advantages than *de novo* entrants, it does not mean that none of *de novo* entrants was better embedded than *de alio* entrants. Otherwise, we would never or rarely see *de novo* entrants being successful.

and *de novo* entrants. The results show that in subsequent partnerships, *de alio* entrants not only sustain endorsement from high-status incumbents, but also offset the initial overall resistance from the market.

5.1 Theoretical implications

We contribute mainly to research on market entry and corporate demography. Having established performance differences between *de novo* and *de alio* entrants (Carroll *et al.*, 1996; King and Tucci, 2002; Ganco and Agarwal, 2009), recent literature strives to understand how such differences are produced. Although most studies focus on their divergences in technology and product demography (Bayus and Agarwal, 2007; Khessina and Carroll, 2008; Chatterji, 2009), we shift attention to how new entrants initiate and develop their network embeddedness, thereby providing a new perspective for their performance differentials. More specifically, we add that *de alio* entrants are better able than *de novo* entrants to secure endorsement from high-status incumbents, which arms them with both institutional and material benefits (Oliver, 1990; Sorenson and Stuart, 2001).[19] However, we also find that *de alio* entrants are less likely to form collaborations with mainstream incumbents, indicating that they encounter a general resistance from mainstream market actors. Taken together, those findings suggest that while high-status incumbents favor collaborating with *de alio* entrants, mediocre incumbents that represent a large share of actors in the market are more hesitated to accept *de alio* entrants as collaboration partners.

Moreover, while prior literature suggests that product advantage of *de alio* entrants fades over time (Carroll *et al.*, 1996), we find that the network differentials between *de alio* and *de novo* entrants are persisted in the later period. The extent to which *de alio* entrants can sustain a certain type of advantage may be contingent on whether the advantage is self-reinforcing. Whereas network advantage, for instance, is one of the advantages that are quite self-reinforcing and cumulative (Gulati, 1995; Li and Rowley, 2002; Kim *et al.*, 2006), product advantage is, however, more susceptible to disruptions. If environment is turbulent with technology discontinuity, product advantage is likely to be disrupted, so that it is hard for *de alio* entrants to sustain the advantage in the product market. As such, our study does not go against prior studies on the diminishing advantages of *de alio* entrants (Carroll *et al.*, 1996; Bayus and Agarwal, 2007). Rather, we emphasize the nature of different advantages: while some types of advantages are more path dependent, others are more vulnerable.

In addition, our study extends the relational discrimination literature. This work highlights that market incumbents may disfavor collaboration with certain types of entrants, but does not distinguish between core and peripheral incumbents (Jensen, 2008). We emphasize instead the heterogeneity of incumbents, because being included by peripheral incumbents is much less helpful than being endorsed by core incumbents. Indeed, it is important to note the distinction between core and peripheral incumbents. Our study shows that although *de alio* entrants are less likely than *de novo* entrants to form partnerships with incumbents in general, they are actually better able to secure endorsements from high-status incumbents.

Finally, our findings add to research on venture capital. Although it is commonly assumed that CVCs are not welcome by IVCs (Hallen et al., 2014), we lack direct evidence about how CVCs are accepted by the VC community. Although Keil *et al.* (2010) show insightfully that CVCs' centrality in the VC network is self-reinforcing, their research does not explain the origins of CVCs' network positions, nor the network differentials between CVCs and IVCs. We provide primary evidence that CVC entrants are better able to establish initial and later ties with high-status incumbents. In other words, CVC entrants are on average better embedded into the VC network. Those findings add to the discussion about how the VC community receives CVCs (Park and Steensma, 2013; Hallen *et al.*, 2014).

5.2 Mechanisms, scope conditions, and future studies

There are several important caveats that deserve attention and could be addressed in future research. First of all, it is important to clarify the exact mechanisms for our interesting findings. We have argued that IVCs are less likely to collaborate with CVC entrants, for two main reasons. On the one hand, it is because of CVCs' impure identity and different industry logics. Indeed, as Hallen *et al.* (2014: 1095) mention, IVCs are reluctant to work with CVCs, as

19 However, while the importance of embeddedness to performance is well established in the literature (e.g. Stuart *et al.* 1999; Hochberg *et al.*, 2007), our study does not provide direct evidence on whether VC entrants benefits from forming initial ties with high-status incumbents. Although it is less likely that entrants who gain network advantages perform worse, future studies may examine the performance implications of initial endorsements for market entrants.

they do not want to be attached with a label of being in the pocket of corporations. On the other hand, it may also be driven by competitive tensions in the context. IVCs are less willing to syndicate with CVCs, because they are concerned that CVCs may misappropriate core technologies of new ventures, which ultimately reduces their expected returns (Katila *et al.*, 2008). Although this article has focused on the empirical differences between IVC and CVC entrants in network embeddedness, we are unfortunately unable to tease out the exact mechanism(s) driving the differences. To disentangle these mechanisms, scholars may need to conduct systematic, in-depth qualitative analysis about venture capitalists' decision-making processes, which is often hard to observe in a quantitative test. We leave it for future work.

Second, while we have developed our theory about market entrants in a more general term, the theory was tested in the specific VC market. There is always a question as to what extent our findings are generalizable to other contexts. On the one hand, the VC market shares many essential features with the traditional product or technology markets. According to prior literature (Khessina and Carroll, 2008; Sahaym, 2013; York and Lenox, 2014), *de alio* entrants receive more resources from their parents, but their parental affiliations also lead to impure identity and conflicting logics. Those are clearly observed in the VC context. CVCs that are founded by established corporates have access to more resources and capabilities that they can leverage for market entry; CVCs are also known for projecting impure identities and introducing different logics that are not consistent the mainstream logics in the VC market (Souitaris and Zerbinati, 2014; Pahnke *et al.*, 2015). As such, CVC and IVC entrants can well represent *de alio* and *de novo* entrants, respectively.

On the other hand, however, it is a distinct context. Although *de alio* and *de novo* entrants in other contexts may adopt similar organizational practices and offer similar products (Carroll *et al.*, 1996), CVCs are fundamentally different from IVCs in terms of their overall investment purpose, the way they are structured, and other identity-related characteristics (Souitaris and Zerbinati, 2014; Pahnke *et al.*, 2015). In other words, CVCs' identities and logics are more deviant from the mainstream, making their embedding process more difficult. We find, however, that CVC entrants are better embedded. This would suggest that in the other contexts where the two types of entrants are less divergent, *de alio* entrants might gain even larger network advantages over *de novo* entrants. Moreover, networks are important in the VC context (Podolny, 2001; Hochberg et al., 2007), so VC entrants are more motivated to gain endorsement from more and high-status incumbents. In the contexts where networks play a minor role, entrants may not strive for high-status partners. If so, network differentials between *de alio* and *de novo* entrants would be difficult to predict. Finally, in the VC market, collaborating with CVCs does not challenge too much the legitimacy of high-status VC firms. In other contexts such as the solar PV industry, however, collaborating with chemical or oil companies can "pollute" the identity of solar PV incumbents who are expected to be environment-friendly. It is therefore interesting to extend our framework to different markets.

Third, while this study focuses on the distinction between *de alio* and *de novo* entrants, we have overlooked the heterogeneity within each type of entrants. For instance, not all CVC entrants are the same. Some stick more to corporate logics, whereas others try to imitate the practices of IVC firms (Souitaris *et al.*, 2012). Such heterogeneity is interesting to explore, because it will definitely determine the extent to which *de alio* entrants are accepted by mainstream incumbents.

Fourth, while we follow prior studies (Jensen, 2008) to focus on whether incumbents include or exclude market entrants, we have made an implicit assumption that entrants are generally motivated to collaborate with incumbents. However, this approach has to overlook the heterogeneity of entrants in terms of their collaboration incentives. In recent network research (Mitsuhashi and Greve, 2009; Mindruta *et al.*, 2016), partnership formation is often modeled as a matching process, by considering the opportunities sets of both sides. So, future studies may adopt matching models to better specify the process.

6. Conclusion

This study draws attention to the embedding process of market entrants, by examining the initial and subsequent partnerships of *de alio* entrants versus *de novo* entrants. We find that while *de alio* entrants encounter an initial relational resistance from mainstream incumbents in general, they are more likely than *de novo* entrants to gain initial endorsement from high-status incumbents. Evidence also shows that initial network positions allow *de alio* entrants to sustain their endorsement advantages, and at the same time to offset the initial overall resistance in the market.

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Appendix. First-stage regressions

Table A1. First-stage selection model

Variables	
Initial partners' status	0.560 (0.257)**
CVC	−0.459 (0.070)****
Seed stage	0.777 (0.166)****
Early stage	0.485 (0.140)****
Expansion stage	0.392 (0.139)***
Later stage	0.285 (0.144)**
Biotech	**1.215 (0.573)****
Semiconductor	**0.947 (0.574)***
Communication	0.744 (0.569)
Computer	0.844 (0.567)
Medical	0.731 (0.571)
Non-hightech	0.630 (0.570)
Constant	−2.706 (0.717)****
Year fixed-effects	Yes
Firm location fixed-effects	Yes
Observations	2823

Standard errors in parentheses. The dependent variable is 1 if the VC entrant had later partnerships in the 3-year window and was hence included in the estimation of later partnerships, and 0 otherwise. ****$P < 0.001$, ***$P < 0.01$, **$P < 0.05$, *$P < 0.10$.