BETTER TOGETHER?
SIGNALING INTERACTIONS IN NEW VENTURE PURSUIT OF INITIAL EXTERNAL CAPITAL

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ABSTRACT

After new ventures have exhausted the limited financial resources of founders, family, and friends, they often pursue initial external capital. To secure investment, entrepreneurs can signal about their venture's latent potential by aligning themselves with reliable third parties. Such affiliations affirm the new venture's legitimacy and provide substantive benefits in the form of mentoring, access to resources, and ongoing monitoring. However, early stage financing is an especially "noisy" signaling environment owing to the large number of startups seeking funding, many of which will not survive. The real value of third party affiliations in this context resides in their ability to unlock the potential of other more pedestrian signals, such as the entrepreneur's characteristics and actions that might otherwise go unnoticed. We borrow from the sensemaking literature to explain how third party affiliation signals disambiguate signals with multiple possible interpretations so that potential investors interpret them positively. Findings support our theory that a startup's characteristics and actions are signals that remain relatively unnoticed unless a startup combines them with a third party affiliation that enhances the signal's value, thus increasing the likelihood of receiving external capital.

Keywords: signaling theory, new ventures, endorsements, sensemaking

New ventures can signal their latent potential to the outside world by aligning themselves with reliable third parties (Gulati & Higgins, 2003; Pollock, Chen, Jackson, & Hambrick, 2010). Under conditions of information asymmetry (Sanders & Boivie, 2004), affiliation with reliable third parties can help reduce uncertainty about a startup by endorsing the quality of the venture and affording it a measure of legitimacy (Jain, Jayaraman, & Kini, 2008; Pollock & Gulati, 2007; Stuart, Hoang, & Hybels, 1999). There is a rich history of studies examining the advantages of uncertainty-reducing third-party *endorsements* for new ventures (Beaty & Ritter, 1986; Certo, 2003; Lee & Wahal, 2004; Pollock, Porac, & Wade, 2004; Singh, Tucker, & House, 1986). For example, scholars have shown that benefits accrue to young firms via endorsements from various credentialing bodies (Baum & Oliver, 1991; Rao, 1994; Rindova, Pollock, & Hayward, 2006) and inter-organizational relationships with high-status actors (Gulati & Higgins, 2003; Haunschild, 1994; Podolny, 1994; Rindova, Williamson, Petkova, & Sever, 2005). New ventures are willing to pay a premium to capture legitimacy-enhancing endorsements (Chen, Hambrick, & Pollock, 2008; Hsu, 2004) and potential investors are willing to pay more for startups that have such endorsements (Carter & Manaster, 1990).

New ventures can also reduce uncertainty for investors by signaling their potential value through venture *attributes*, such as characteristics of their management team, and *actions*, such as their compensation plans and market presence (Arthurs, Busenitz, Hoskisson, & Johnson, 2009; Higgins & Gulati, 2006; Lee, 2001; Westphal & Zajac, 1998). Some have considered these different signals as if they are isolated (Deeds, Decarolis, & Coombs, 1997; Filatotchev & Bishop, 2002; Jain et al., 2008), but others have begun to explore how various uncertainty-reducing signals in the new venture context might accumulate or work together. For instance, Pollock and colleagues (2010) find that the benefits of firm attributes–e.g., prestigious executives

and directors–accrue in a linear fashion, whereas the benefits of endorsements–e.g., prestigious third parties, such as venture capital firms and IPO underwriters–accrue in a curvilinear, diminishing-returns fashion. Others have investigated the contingent nature of new venture signaling, finding, for example, that prestigious ties are more valuable in certain markets and when made early in a firm's lifecycle (Gulati & Higgins, 2003; Lee, Pollock, & Jin, 2011).

The preponderance of this work on entrepreneurial signaling considers initial public offerings (IPOs), with less research focused on the critically important early stages of a firm's life cycle (Choi & Shepherd, 2004; Huyghebaert & Van de Gucht, 2004). In this context, startups have exhausted the resources of the entrepreneur's circle of friends and family and are seeking an initial infusion of external capital (Cassar, 2004). Compare, for instance, a recent graduate seeking funding for a smartphone venture to Facebook's record-setting $104 billion IPO. Information asymmetry associated with the startup is far greater because firms approaching IPO, like Facebook, must provide standardized, regulated information whereas the information provided by startups could be perceived as exaggerated, incomplete, or even false (Daily, Certo, & Dalton, 2005). Further, early stage financing has more instability because the startup, being at an early stage of development, could radically change its strategic direction as the venture grows (Gilbert, McDougall, & Audretsch, 2006). Lastly, there are many more early stage, than late stage, firms in which to invest, so potential investors need to process a wider range of information. These characteristics make for an especially "noisy" signaling environment (Connelly, Certo, Ireland, & Reutzel, 2011).

Faced with this very different environment, we develop theory on the way signals operate together under noisy, ambiguous, and uncertain conditions. We advance and test an argument that third party signals complement other signals in the early-stage financing context (Hallen &

Eisenhardt, 2012; Kane, Lee, & Marcus, 1984). Third-party signaling becomes paramount because of high levels of uncertainty: in this scenario, third party signals strengthen other signals so that the endorsement enhances the influence of the first signal on the likelihood of receiving external capital. For instance, third party signals may validate the authenticity of a startup's attributes and both sanction the motivation and confirm the value of a startup's actions, thus reducing uncertainty associated with the entrepreneur's decision-making. As a result, investors may have less uncertainty about a startup's attribute and action signals when a third party endorses them. Third party affiliations activate a new venture's attribute and action signals by corroborating the firm's own demonstrations of its maturity and commitment.

Our study offers several potential contributions to the literature. First, whereas extant studies generally examine the influence of signals in the context of an IPO (Certo, Holcomb, & Holmes, 2009), we examine signaling influences on a relatively unexplored but critical milestone in the life of a new firm: whether they receive external funding at all (Eckhardt, Shane, & Delmar, 2006). Second, we explore how different signals work in concert with one another in the special context of early-stage financing (Li & McConomy, 2004). Doing so reveals that third party affiliation considerably improves a startup's ability to receive external funding, but to capture fully the benefits of affiliations, startups need to combine them with other signals that demonstrate their maturity and commitment. Third, we introduce some new signals that come to the fore owing to the signaling context. The signals we investigate are rather pedestrian, more blunt (i.e., more readily observable), and less costly relative to IPO signals, and thus potentially ambiguous. Our theory and findings suggest that third-party affiliations heighten the value of these pedestrian signals and make them salient to potential investors. We discuss the implications of our ideas for research and the consequences of our findings for entrepreneurs and investors.

CONCEPTUAL BACKGROUND

One of the main factors in determining which new ventures thrive and which languish is access to financial capital (Gilbert et al., 2006). Higher levels of capitalization empower entrepreneurs to undertake more ambitious strategies, provide them with the flexibility to adapt in rapidly changing environments, and enable them to meet the demands of rapid growth (Cooper, Gimeno-Gascon, & Woo, 1994). Initial funding required for a startup may be sourced from the founding team, friends, or family (Berger & Udell, 1998), but the capital required for sustained growth often outstrips the abilities of this group (e.g., Cassar, 2004). Thus, obtaining external financing is critical to startup performance (e.g., Lee, Lee, & Pennings, 2001). Acquiring initial external capital represents a major accomplishment as many young firms never receive any outside financial backing (Kerr & Nanda, 2009). One reason is that most new ventures suffer from substantial information asymmetry between the venture and potential investors (Sanders & Boivie, 2004; Wiklund, Baker, & Shepherd, 2010). In such situations, investors often rely on signals that can help improve their ability to judge the quality and future value of a new venture, thus reducing uncertainty (Certo, Daily, Cannella, & Dalton, 2003; Higgins & Gulati, 2006; Lounsbury & Glynn, 2001; Rindova, Petkova, & Kotha, 2007).

Third Party Signaling

Scholars have devoted particular attention to the role of third-party affiliates as signals that enhance the market valuation of new ventures, especially those nearing IPO (Gulati & Higgins, 2003; Higgins & Gulati, 2006; Podolny, 1994; Pollock et al., 2010). A young firm approaching IPO might be endorsed by a prestigious affiliate (Haunschild, 1994), a discerning intermediary (Rao, 1994), a certifying institution (Baum & Oliver, 1991), or any third party with information about the young firm that potential investors believe to be superior to their own

information (Dean & Biswas, 2001; Pollock et al., 2004; Zhang & Wiersema, 2009). The investment decision at IPO actually involves relatively complete information about a small number of investment targets because firms nearing IPO are required to submit standardized information about their management team, governance structure, finances, and business model (Certo et al., 2009). Therefore, the function of third party affiliations for IPO-stage firms is largely as an endorsement of the value of the firm (Ritter & Welch, 2002; Stuart et al., 1999).

During early stage investment, third-party signaling may be even more important than in later stages. The decision to invest in a startup is marked by greater information asymmetry and uncertainty than that which exists at IPO (Kirsch, Goldfarb, & Gera, 2009). Investors have less standard and less reliable information. Startups seeking initial external capital provide potential investors with selective, and largely unregulated, information. In fact, there may simply be less information to share because startups seeking their first external capital infusion may not have a track record with respect to what they have done with their money or what they have accomplished. Thus, those signals that are available to potential investors tend to be uncertain and ambiguous. Moreover, at this early stage, investors are presented with many investment opportunities, so they are working with a large choice set. This increases the noisiness of the signaling environment, making it difficult for signals to be noticed (Pollock & Gulati, 2007), complicating investor assessment of new venture performance potential. Thus, a startup seeking external capital faces the challenge of both drawing the attention of investors and credibly conveying the venture's potential in a crowded and noisy environment.

VDO Affiliation

Under these uncertain, ambiguous, and noisy environmental conditions, we suggest that a key third-party affiliation signal for startups seeking initial external capital comes from

supporting organizations that help new ventures launch and grow. These venture development organizations (VDOs) are typically entities that offer new firms a combination of concept evaluation, mentorship, networking assistance, and funding access in exchange for a client company fee (Renault, 2012). Examples of prominent VDOs include Techstars in Colorado, JumpStart in Ohio, and Y-Combinator in California. VDOs provide a number of resources critical for early-stage growth (Clouse & Austrian, 2013). For example, the Techstars VDO provides client firms access to a small pool of capital, and access to a network of investors from which additional funds can be raised. Firms accepted into Techstars receive access to office space, and mentors engage with the company to help it refine its product/service, make necessary strategy changes or "pivots," and assist in identifying and contacting prospective customers, partners, and service providers. Because of their ability to understand what is important for firms to succeed, a relationship with a VDO serves as a meaningful signaling mechanism to outsiders (Bergh, Connelly, Ketchen, & Shannon, 2014). In the context of early-stage financing, third party affiliations signal investors in two ways, by (1) endorsing the quality of the startup and founding team, and (2) communicating to investors that the third party will provide key substantive benefits to the startup (Lee et al., 2011).

Endorsement. VDOs are an effective endorsement of firm quality because many potential investors believe VDOs have an ability to make informed judgments about startups. VDOs are in the business of assessing new ventures; over time they acquire special resources and abilities for doing so. At the same time, VDOs highly value their reputation, which is the basis on which they compete. VDOs are likely to be careful to avoid tarnishing their reputation by working with startups that do not have a reasonable chance of success (e.g., Nanda & Yun, 1997). Thus, VDO affiliation says to potential investors that the new venture is likely to be of a certain quality.

Substantive Benefits. VDO affiliation signals potential investors that a new venture will have access to substantive benefits that will help them succeed. Among these are (1) mentoring and advice, (2) access to resources, and (3) governance structures. First, perhaps the most important of benefits is access to mentoring and advice (Deakins, Graham, Sullivan, & Whittam, 1998). Entrepreneurs face many decisions associated with early-stage growth (Busenitz & Barney, 1997). Having an established relationship with a VDO can provide an entrepreneur with guidance on their plans (e.g., Ucbasaran, Lockett, Wright, & Westhead, 2003). VDOs also provide expertise on dealing with a wide variety of stakeholders, such as investors, customers, suppliers, regulators, partners, and competitors. VDOs can lend their accumulated experience so that clients can avoid mistakes (Cope, 2005). Second, VDO affiliation provides access to resources (Stuart et al., 1999). This is particularly important for early stage, resource-constrained ventures (e.g., Fischer & Pollock, 2004; Jain & Kini, 2000). VDOs can provide capital themselves or via others, thus improving a venture's likely performance (e.g., Cooper et al., 1994; Lee et al., 2001). Their many connections to other investors may allow VDOs to serve a brokering function to construct a deal and social network for affiliated client firms (e.g., Pollock et al., 2004). Third, VDO affiliation signals to potential investors that a new venture will benefit from the VDO's governance and monitoring structures. Investors believe early-stage ventures require the greatest amount of monitoring (Sapienza, Manigart, & Vermeir, 1996), however early-stage ventures frequently have few formal governance structures. VDOs likely wish to maintain close, long-term relationships with funding partners and are therefore strongly motivated to keep those partners satisfied. Since a VDO's relationship with a client extends well beyond initial investment and can include technologies, logistics, and expertise (Renault, 2012),

VDOs can provide investors with ongoing knowledge. Involvement of a VDO can provide initial governance while the startup assembles a board, perhaps with the use of the VDO's contacts.

Thus, in each of these substantive ways, a firm associated with a VDO is likely to be higher quality than a non-affiliated firm is, so the VDO affiliation is an effective signal. Overall, we expect that affiliation with a VDO will have a positive relationship with the probability a new venture receives external capital. Because research has consistently shown that third-party endorsements improve firm capitalization outcomes (Beaty & Ritter, 1986; Certo, 2003; Lee & Wahal, 2004; Pollock, Porac, & Wade, 2004), we do not develop a specific hypothesis for this relationship. Instead, we use this baseline assumption as a point of departure for exploring how certification by a VDO affects the interpretation of other, more ambiguous signals.

Signal Interactions

Firms can send simultaneous signals (Li & McConomy, 2004) that work together with third party affiliation to improve the firms' likelihood of being selected by external investors. Yet, these signals have to be noticed to be effective (Pollock & Gulati, 2007), and, if the firms' characteristics and activities are open to multiple, conflicting interpretations, they may be ignored. Thus, new ventures face the challenge that investors may have trouble making sense of their signals as they may be uncertain, ambiguous, and must be sent amid other signals in a noisy signaling environment (e.g., Connelly et al., 2011). We suggest that third party affiliation–such as being a client firm of a VDO–can effectively activate uncertain, ambiguous, and noisy signals that would otherwise remain dormant (Connelly et al., 2011). In later stage investing, affiliations are important mainly because of their certifying role (Certo, 2003; Chen et al., 2008), but for early-stage investing the emphasis shifts toward the substantive benefits that third parties provide.

To explain how investors make sense of ambiguous, uncertain, noisy signals by using the additional information a third-party affiliation provides, we borrow from the literature on sensemaking (Weick, 1995). Signaling theory describes how signalers provide information to observers (Spence, 1973); research on sensemaking provides an explanation for how receivers process and act upon that information (Weick, 1995). Gioia and Thomas (1996) contend that sensemaking may be understood in terms of perceiving the meaning of events based on information surrounding an organization. This line of study suggests that navigating ambiguity is a particularly daunting challenge for those facing a choice set (Weick, 1979, 1995). Ambiguity exists when multiple viable interpretations surround a given piece of information (Gioia & Chittipeddi, 1991). This is apropos to early-stage financing because a new venture's characteristic and activity signals could have multiple interpretations. For instance, these signals could point to exuberance, unrealistic projections, and lack of experience; alternatively, they could be valid signals of new venture quality. Thus, even if potential investors notice a startup's signals, they may not know how to process the information those signals provide on their own. VDO involvement makes a signal more noticeable, allowing it rise above the noise, reduces the uncertainty of the underlying information, and resolves signal ambiguity, making the signal relevant and allowing potential investors to interpret the signal positively. As, in general, scholars have examined two main categories of signals in addition to third party affiliations– those that are grounded in the signaler's *characteristics*, such as attributes of the firm, and those based on the signaler's *activities*, such as marketplace actions of the firm (Higgins & Gulati, 2006; Petkova, 2012; Pollock & Gulati, 2007)–we test these ideas on specific characteristic and action signals.

Signaler Characteristics. These signals demonstrate to outsiders the quality of a firm's unobservable resource stocks and capabilities that lesser firms do not have. As Stuart and colleagues (1999: 317) note, "because the quality of young companies often cannot be observed directly, evaluators must appraise the company based on observable attributes that are thought to co-vary with its underlying but unknown quality." Signals that demonstrate the quality of a new venture's resources enable them to obtain capital on more favorable terms (Heeley, Matusik, & Jain, 2007; Hsu & Ziedonis, 2013). Perhaps the most common signaler characteristics outside investors look for to identify high quality new ventures are those that point to the quality of the firm's human and social capital (Beckman, Burton, & O'Reilly, 2007; cf. Zhang & Wiersema, 2009), and in particular, the managerial experience of the founding team (Stuart & Abetti, 1990). Studies show that prior managerial experience can help young firms in a number of ways. For instance, managers with extensive experience may be able to better identify the best opportunities and, conversely, avoid inferior opportunities that do not have as much latent potential (Ucbasaran et al., 2003). Leaders of new ventures that have prior managerial experience are also less likely to make fatal mistakes (Ucbasaran, Westhead, Wright, & Flores, 2010). Others describe how managerial experience can help demystify the responsibilities associated with running a business, freeing up time and resources, and improving the likelihood that managers will not be plagued by missteps (Mitchell, 1997). Further, having managerial experience provides managers of new ventures hooks on which to hang new knowledge, thus improving their ability to learn and adapt to competition and environmental changes (Reuber & Fischer, 1994). As such, prior managerial experience may be a useful signal of quality for new ventures seeking initial capital investment.

However, the way in which potential external investors make sense of signals of managerial experience is likely contingent on third party affiliation. The meaning of the signal alone is ambiguous because many people have managerial experience, so it is difficult for potential investors to know if the experience will translate into sound entrepreneurial decision-making. By taking on a new venture as a client, VDOs both certify and draw out the value of the entrepreneur's prior managerial experience. Absent such a third-party affiliation, potential investors could question the usefulness of the entrepreneur's prior experience or the ability of the entrepreneur to learn from their mistakes (Ucbasaran et al., 2010). After all, not all managerial experience is worthwhile and not everyone learns from their experiences. As such, outside investors may attend less to this signal when there is no third-party affiliation to validate its credibility and affirm its benefits to the entrepreneur (Connelly et al., 2011).

Affiliation with a VDO magnifies the strength of this signal. By itself, managerial experience sits in a noisy environment wherein potential investors may have trouble distinguishing one person's experience from another. There are many possible interpretations about whether managerial experience will be beneficial to a new venture (e.g., relevance of the experience, how practical was the experience, how much responsibility did the manager really have). As an example, the JumpStart VDO conducts a professional background check of the founder(s) as part of their due diligence with a view toward checking claimed credentials and prior managerial experience. Thus, JumpStart effectively helps reduce the uncertainty of the firm's characteristic signals. This reduced uncertainty allows investors to make sense of the firm's signal, allowing them to draw a positive attribution from the firm's signal. VDOs may also help reduce signal ambiguity by communicating to potential investors that they will mentor the entrepreneur, thus making their prior managerial experience relevant. Ongoing monitoring

also helps to maximize the value of prior managerial experience. Thus, VDO affiliation helps potential investors make sense of the weak managerial experience signal, enhancing its value and setting it apart from the noise of the early-stage financing context. Therefore, we hypothesize:

> *Hypothesis 1: The managerial experience of the founder will increase the probability a new venture receives external capital only when the new venture also has a VDO affiliation.*

Signaler Actions. In addition to having unique characteristics, or resources, that set them apart from others, there are also a number of actions a firm can take to demonstrate their value to outside investors (Hsu & Ziedonis, 2013). One signaling action a startup can undertake that is both costly and difficult to imitate is to introduce a product on the market (Fischer & Reuber, 2007; Rindova et al., 2007; Verona, 1999). For instance, Petkova (2012: 386) describes "specific visible actions that can set young firms apart from competitors by signaling their underlying quality and potential to various stakeholders…such actions include innovation and new product introduction." Similarly, Deeds, Decarolis, and Coombs (1997) find that new products in development are an important signal to investors that is positively associated with the amount of capital new ventures can raise. These authors argue that new products are an indicator of technological competence and expertise. Smith, Collins, and Clark (2005: 346) agree, observing that "new product introduction is a function of a firm's ability to manage, maintain, and create knowledge." Thus, introducing a product to market signals investors about the young firm's maturity and ability (Nadeau, 2010).

However, a new product could be good or bad, so there is ambiguity associated with the new product signal by itself. This again leaves potential investors a sensemaking challenge as they may not know how to interpret the new product introduction signal. Having a product on the market might help outside investors distinguish between high- and low-quality ventures (Bergh

et al., 2014), but this depends largely on investor perceptions of the product itself and the actions the firm undertook to get it to market (Song, Podoynitsyna, Van Der Bij, & Halman, 2008).

Potential investors are better able to make sense of product availability and thus more likely to perceive it as a positive signal when startups combine it with VDO affiliation. With VDO affiliation, outside investors are afforded a higher level of confidence that the product has not been rushed to market and that it is truly indicative of the young firms' capabilities. For example, the JumpStart VDO works to ensure the quality and validity of its client firm's products by helping client companies arrange and conduct market trials of their product with major corporations. In doing so, the VDO reduces uncertainty about the quality of the product on the market. In fact, because VDOs are embedded in their industries and marketplaces, and are intimately familiar with their client firms, potential investors may be more confident in the VDO's ability to process information about the reliability of a new-product signal than they are in their own ability to do so. Because VDOs must maintain their reputation both with new ventures and potential investors, they are unlikely to take on a startup as a client if they believe their product offering did not have potential or, worse, if they thought the startup was attempting to use a sub-standard market offering as a false signal to attract investors (e.g., Busenitz, Fiet, & Moesel, 2005). Therefore, investors may be more likely to make sense of product availability as a positive signal when it is combined with VDO affiliation. Formally:

> *Hypothesis 2: Having at least one product introduced to the market will increase the probability a new venture receives external capital only when the new venture also has a VDO affiliation.*

Another type of signaling action new ventures may undertake to demonstrate their underlying quality involves managers taking on a credible commitment to suffer negative consequences in the future if the new venture does not deliver (Bhattacharya, 1979; Deb, 2013;

Kao & Wu, 1994). For instance, Goranova, Alessandri & Brandes (2007) describe how insiders buying stock in their own firm signal potential investors because, if the firm performs poorly, the managers will lose personal wealth. Similarly, Arthurs and colleagues (2009) show that when managers offer a longer lockup period during IPO (exposing themselves to downside risk), it signals investors about the long term viability and quality of the young firm. Petkova (2012: 386) calls these "symbolic actions" because the manager's willingness to take on risk shows they are willing to suffer personal loss if the new venture does not perform well (cf. Filatotchev & Bishop, 2002; Jain et al., 2008).

Given the vast array of startups seeking early-stage financing, outside investors must look for blunt (i.e., highly observable) indicators of managerial commitment. One such signal may be whether or not the entrepreneur has gone beyond working from home and taken the added step of moving into commercial property (Brush, Greene, & Hart, 2001). Many, if not most, startups operate as a home-based business as long as they can afford to do so because working from home can save money and minimize the entrepreneur's risk (Good & Levy, 1992). By operating from commercial property, the entrepreneur makes their startup known, communicating to outsiders that the endeavor is not a side bet and providing a visible and serious projection to the outside world (Mirchandani, 2000). If the venture fails, the consequences will be greater for a startup that has moved into commercial property, compared to a home-based business, because there will be physical space, signage, and specific assets that go unused and a higher likelihood of social stigma as the entrepreneur is publicly associated with a failed endeavor (Cardon, Stevens, & Potter, 2011). Operating from commercial property would have no signaling value at IPO, but could demonstrate managerial resolve at an earlier stage of investment.

The value of this signaling action depends on potential investors' sensemaking and what they expect an affiliated VDO to do. By itself, without the third-party affiliation of a VDO, the signaling value of a symbolic act, such as operating from commercial property, may be limited because the signal is open to multiple interpretations by receivers. For instance, an irrationally exuberant entrepreneur could make such a move even if the business in its current stage did not warrant doing so (Coelho, de Meza, & Reyniers, 2004). In fact, some startups might move to commercial property to project the appearance of maturity even though they are merely doing so to attract external capital. Further, outside investors are unlikely to know how well suited a given property is to the new venture's objectives, further increasing the signal's ambiguity (Cassar, 2004). Because investor sensemaking cannot easily resolve commercial property to an unambiguous meaning, the firm's action signal is–on its own–a weak signal that is unlikely to rise above the noise of the signaling environment. VDO affiliation, though, could enhance the value of this signal and greatly improve a new venture's chances of receiving external capital.

VDO affiliation confirms the soundness of the entrepreneur's decision to move to commercial property and protects against the possibility of false signaling (Davila, Foster, & Gupta, 2003). Owing to their in-depth knowledge of their clients and their ability to critically evaluate entrepreneurs, VDOs should be able to sift out those who have acted irrationally from those who have made more realistic and sensible commitments (Certo, Connelly, & Tihanyi, 2008). For example, the JumpStart VDO helps its client ventures with hiring talented workers, which includes advice on selecting the right office space to help attract and retain the right employees. This advice would suggest to investors that the office space a JumpStart-backed firm occupies has been selected in the long-term strategic interest of the venture. Third-party affiliation shapes investors' sensemaking such that they are able to draw positive meaning about

the firm's action signal and make a positive attribution about the quality of the signaling firm. Therefore, we hypothesize:

> *Hypothesis 3: Operating from commercial property will increase the probability a new venture receives external capital only when the new venture also has a VDO affiliation.*

METHODS

We test our hypotheses in the context of nascent high-technology start-up firms. New high-technology ventures typically consume significant cash and require greater financial resources than the entrepreneurs' personal savings, friends and family, or bootstrap financing can provide (Kotha & George, 2012). We collected data on new technology firms in Oklahoma seeking startup capital and their affiliation, or non-affiliation, with a VDO in that state. For a nontrivial fee, the VDO provides in-state startups with independent feasibility and business plan assessments and assigns a team of advisors to work closely with the venture's founders. In addition, the VDO introduces its client firms to various sources of equity financing, including a network of angel investors. Before a new venture can become a client, the VDO's staff and consultants—many of whom have extensive backgrounds either as investors and/or entrepreneurs—complete a thorough review of the new venture and its leadership team. The review process includes extended interviews, multiple meetings, and professional and criminal background checks of the founders and key personnel.

Sample

The core of our data was collected from the VDO's database of new ventures, which is unique insofar as it allows us to examine a comprehensive set of new ventures at an early stage in their organizational life. We use a number of the VDO's internal measures in our analysis for several reasons. First, because the VDO is highly motivated to demonstrate the effectiveness of its programs to a variety of public and private stakeholders, it maintains detailed records on both

its client *and non-client* firms. Second, because the majority of new firms enter the VDO's records prior to incorporation, the data are less subject to survivor bias than public databases that include only new ventures that are formal, legal entities (e.g., Busenitz & Murphy, 1996). Third, the thoroughness of the VDO's due-diligence in selecting its client firms and its accountability as an organization affords confidence in the accuracy of the data. From a dataset of 1,109 startups initiated between 1995 and 2010 in the U.S. state of Oklahoma, we removed 123 with contradictory or missing location information (e.g., city, state, phone number, and/or zip code); for example, some records listed an in-state city but an out of state zip code. This yielded a sample of 986 firms, of which 144 received external capital investment.

Dependent Variable

We use VDO records to create a dichotomous variable, *Capital Received,* which is equal to 1 if a new venture secured equity investment and 0 otherwise. The type of external investment indicated by the dependent variable includes venture capital, private equity, and angel investment and does not include founder equity, friends and family investment, debt financing, or government sources (e.g., grants). Investment capital information was collected and validated according to the following procedure. First, new ventures provided information on capital raised as part of initial contacts with the VDO. Second, the VDO conducted annual surveys of both its client and non-client firms to solicit additional information on capital received from all sources. Third, the VDO tracked any investments made by any funding sources to which the VDO referred a client. Finally, the VDO checked its records against major VC databases, such as ThompsonONE, to validate reported figures and collect additional data on any in-state investment activity of which the VDO was unaware. As a check of the VDO's records, a colleague of the authors reviewed all the business plans of the new firms that received capital

investment to check for any investment activity not indicated in the VDO's data. This last step revealed that the VDO failed to record only one small angel investment for a single venture.

Independent Variables

VDO Affiliation. VDOs carefully vet new ventures and their founders before accepting them as a client, so we use information on whether the venture paid a VDO client fee as an indicator of a venture's *VDO Affiliation*. We define a dummy-coded variable that takes the value of 1 if the venture paid a VDO client fee and 0 otherwise.

Managerial Experience. We matched the names and locations of the founders in the VDO's records with the names and locations of business owners and principal managers listed in the Oklahoma file of the National Establishment Time Series (NETS) database. The NETS file lists every in-state business establishment from 1990 to 2010. We used this information to create a continuous variable, *Managerial Experience*, which is a count of the number of other businesses in Oklahoma that the founders have owned or principally managed. Although founders of ventures in our study could, potentially, have founded or managed ventures in other states, we expect their in-state experience would be most salient and observable to investors and thus should act as a reasonable proxy for managerial experience of the founder.

Product Introduction. We used information from the VDO's records regarding the active status of the venture and their stage of development to define a single dummy-coded variable, *Product Introduction*, equal to 1 for firms with products on the market and 0 otherwise.

Commercial Property. We matched address information in the VDO's records with publicly available real estate records to define a single dummy-coded variable, *Commercial Property*, which is equal to 1 for firms located in areas zoned non-residential and 0 otherwise.

Control Variables

We control for several characteristics of the new venture. The first of these control variables is an estimate of the firm's *Age* measured in years. Since the majority of firms in our dataset are nascent and, thus, lack an obvious birth date, we calculated a proxy for the firm's age as the difference between the focal year of analysis and the year of the venture's first contact with the VDO. Although we were not able to capture how long the startup may have been operating on a small scale prior to this time, this operationalization does capture variance in the amount of time the firm has been visible to the VDO. In addition, we used information from Dun and Bradstreet, the NETS database, and public records to create a second control variable, *Size,* which is the natural logarithm of the number of workers employed by the new venture.

Some of the relationships under investigation could be confounded by industry. For example, we expect it would be less likely for biotech startups to have a product available on the market. Therefore, we created a set of seven *Technology Sector Dummies* to control for industry (Mason, 2007). These industry dummies categorize new firms in the following technology sectors based on three-digit SIC classifications: (1) energy and environment (reference category), (2) computer hardware and test equipment, (3) software and telecommunications, (4) medical devices and biotechnology, (5) defense and transportation, (6) pharmaceuticals and chemicals, (7) advanced materials and photonics, and (8) manufacturing equipment and factory automation.

We consider two related geographic controls. First, research indicates that investor attention is focused on urban areas (Chen, Gompers, Kovner, & Lerner, 2010). Thus, we created a set of four *Location Dummies,* to indicate each new firm's location in the urban hierarchy using information from the Urban Influence Classification (UIC) codes (Ghelfi & Parker, 1997). We defined the dummy-coded variables to indicate whether a firm is located in a (1) large urban

county environment (reference category), (2) small urban county, (3) metropolitan county adjacent to an urban area, (4) metropolitan county not adjacent to an urban area, or (5) non-core county. Second, depending on county borders, it is possible for a venture to be located in a non-urban county and yet be nearer to an urban core than a venture located in an urban county. To account for this, we used the coordinates of each venture and of the VDO's two offices–each located in the most central district of the two largest cities in the state–to calculate the *Distance to Urban Core* as each venture's Euclidean distance in miles to the nearest of the two cities.

Finally, university spinoffs and university-related ventures could confound our results because they have high levels of legitimacy even without VDO affiliation. Therefore, we controlled for *University Proximity* by determining a new firms' proximity to campuses based on the postal codes contiguous to one of five major university campuses in the state.

Model and Analysis

Since the dependent variable of interest is a binary outcome, we use a logit model to test the hypotheses. The general logit model is a follows:

$$\ln\left[\frac{\Pr(C_i = 1)}{1 - \Pr(C_i = 1)}\right] = A_0 + X\beta$$

where Pr(C_i = 1) is the probability that venture i receives capital investment and β is a vector of logit coefficients associated with the matrix of independent variables X. A logit coefficient (β) indicates a given variable's influence on the chances—expressed in log odds—that a new firm receives capital. Once investors put their money into a company in given region they are more likely to invest in another company nearby (Chen et al., 2010; Sorenson & Stuart, 2001). Such dependence could bias the test statistics and confidence intervals produced by the logit estimator (Hoetker, 2007). Thus, we use robust standard errors clustered by county to address this departure from the independence assumption.

To test the moderating hypotheses, we add an interaction term, x_1x_2, to the logit model and extend the general model as follows:

$$\ln\left[\frac{\Pr(C_i = 1)}{1 - \Pr(C_i = 1)}\right] = A_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_{12} x_1 x_2 + X\beta$$

However, as with other nonlinear models, the coefficient for the interaction term, β_{12}, is not an estimate or test of the hypothesized moderation effect for two related reasons. First, it is not an estimate of the moderation effect because the scale of the logit coefficient is not the scale of interest (Ai & Norton, 2003; Karaca-Mandic, Norton, & Dowd, 2012). Whereas the hypotheses predict the effect of organizational signals on the *probability* of a firm receiving capital investment, the main beta coefficients, β_1 and β_2, are interpreted as the natural log of the *odds ratio*. The beta coefficient of the interaction term, β_{12}, on the other hand, is the natural log of the ratio of two odds ratios. One cannot interpret a ratio of odds ratios in the form of a likelihood (Karaca-Mandic et al., 2012; Kleinman & Norton, 2009). Thus, the magnitude, direction, and statistical significance of the coefficient of the interaction term cannot be directly interpreted as a predictor of the probability of receiving external capital.

Second, the logit coefficient for the interaction term is not the true indicator of the interaction effect (Hoetker, 2007). Specifically, in the logit model, the interaction effect of two interacted dummy variables—expressed in terms of the probability of given outcome—is calculated as follows:

$$\frac{\Delta^2 F(u)}{\Delta x_1 \Delta x_2} = \frac{1}{1+e^{-\beta_1+\beta_2+\beta_{12}+X\beta)}} - \frac{1}{1+e^{-(\beta_1+X\beta)}} - \frac{1}{1+e^{-(\beta_2+X\beta)}} + \frac{1}{1+e^{-X\beta}}$$

(Norton, Wang, & Ai, 2004). Unlike linear regression (e.g., ordinary least squares) where the coefficient for the interaction term, β_{12}, is an estimate and test of the interaction effect, this equation shows that the true interaction effect in a logit model is a function of the interaction coefficient, β_{12}, the main effects coefficients, β_1 and β_2, and the values of the remaining

coefficients in the model. Consequently, the interaction effect of x_1 and x_2 could be statistically significant even if the logit coefficient, β_{12}, is not significant (Karaca-Mandic et al., 2012).

Therefore, we test the hypotheses and interpret the results in terms of the average marginal effects of the independent variables and their interactions (Hoetker, 2007). A marginal effect refers to the change in probability of the predicted outcome (i.e., capital received) due to a one-unit change in the independent variable (Ai & Norton, 2003; Gulati, 1999; Hoetker, 2007). To estimate the main and interaction effects of the predictors, we use the logit estimates to calculate the predicted probability of capital investment for each observation in our data set and then use the predicted probabilities to compute the magnitude, sign, and statistical significance of the average marginal effects of the predictors and their interaction (Norton et al., 2004).

RESULTS

INSERT TABLES 1 AND 2 ABOUT HERE

Table 1 provides descriptive statistics and correlations and Table 2 reports the logit regression coefficients, robust clustered standard errors, and average marginal effects for testing the hypotheses. The regression table also reports the log-likelihood and Wald chi-square statistics for each model; however, the log-likelihoods are not comparable across models because we have clustered the data by county. The correct classification rate of all models is 86%, which is superior to the 75% classification accuracy of a random model (Hosmer & Lemeshow, 2000). Although not reported, we used the Hosmer-Lemeshow chi-square statistic to gauge each model's goodness-of-fit, conducted link tests to check each model's specification, and calculated variance inflation factors (VIF) and multicollinearity condition numbers (MCN) for each model. None of these tests suggested misspecification.

In Table 2, Models 1 and 2 report the logit coefficients and average marginal effects estimates for the controls-only model and a main effects model, respectively. In terms of control variables, the average marginal effects estimates indicate that aging one year increases a firm's probability of investment by about 0.8 percent, locating ten miles further away from an urban core reduces the probability of investment by approximately 2 percent, and locations near a university also increase the probability of investment by about 2 percent. We also find that being affiliated with a VDO is positively associated with the probability of a new venture receiving external capital. From Model 2, we calculate that the average marginal effect of the VDO affiliation signal is 0.249, meaning that being affiliated with a VDO increases the probability of receiving external capital investment by 25 percent. These results are consistent with prior research and corroborate our baseline assumption.

Hypothesis Tests

Models 3 to 5 test Hypotheses 1 through 3, respectively. As a check of the estimates, Model 6 reports the logit coefficients and average marginal effects for all interactions, simultaneously. We find support for Hypothesis 1, which states that managerial experience of the founder positively interacts with VDO affiliation to influence the probability of a new venture receiving external capital. As shown in Model 3, we find a positive and significant effect of both VDO affiliation and managerial experience of the founder on the probability of capital investment. Specifically, a one-unit increase in the number of other businesses the founder has owned or managed increases the probability of capital investment by only about 1.8 percent. The estimates indicate that the interaction of VDO affiliation and managerial experience is positive and statistically significant. As shown in Figure 1, we found that managerial experience matters less when there is no VDO affiliation. Without the third-party affiliation signal, the mean

probability of capital investment was only 5.4 percent higher for those ventures with highly experienced founders compared to those that had founders with low managerial experience. In contrast, for ventures *with* the third-party affiliation signal, the difference in the probability of investment between those with high and low managerial experience is nearly 44 percent.

INSERT FIGURE 1 ABOUT HERE

Similarly, we find support for Hypothesis 2. This hypothesis predicts that having at least one product introduced to the market positively interacts with VDO affiliation to influence the probability of a new venture receiving external capital. Model 4 in Table 2 shows that VDO affiliation and product introduction increase the probability of investment by 25 percent and 9.1 percent, respectively. The results also indicate a positive and statistically significant interaction. As shown in Figure 1, we find that without VDO affiliation the effect of product introduction has little detectable effect on the probability of investment but—when coupled with the third-party affiliation—product introduction increases the probability of investment by nearly 27 percent.

Finally, we find support for Hypothesis 3, which states that operating from commercial property positively interacts with VDO affiliation. From the results of Model 5, commercial property increases the probability of investment by 6 percent. The interaction with VDO affiliation is positive and significant. As shown in Figure 1, commercial property increases the probability of investment by only a little more than 1 percent for those ventures without VDO affiliation. However, for those with VDO affiliation, commercial property increases the probability of investment by about 15 percent.

Robustness Checks

Using two types of bivariate probit models, we examined the reported results for both endogeneity and selection bias based on the possibility that (1) receiving capital makes signaling

more likely (i.e., reverse causality) and (2) the VDO itself reacts to signals from the startups. The general bivariate probit model is given by the following system:

$$y_1^{probit} = X_1\beta_1 + \mu_1$$
$$y_2^{probit} = X_2\beta_2 + \mu_2$$

where the error terms, μ_1 and μ_2, are univariate normal with mean zero. Most germane to our robustness checks, the correlation of the two error terms, μ_1 and μ_2, can be estimated by a correlation parameter, ρ. If the correlation parameter, ρ, is zero, the two equations are unrelated and can each be estimated by a standard (univariate) probit. However, if ρ is not zero, this suggests the standard probit estimates of either equation may be inefficient or inconsistent. Therefore, the correlation parameter, ρ, can be used as a test for selection and endogeneity bias.

Selection bias. The first type of model we used to check our findings was bivariate probit with selection, also known as Heckman probit. To do so, we created a set of nine dummy variables that we call *Referral Dummies* to indicate how the founder came into contact with the VDO; these contacts are: (1) one of the VDO's existing clients, (2) websites and internet resources, (3) investors, (4) non-internet media sources (e.g., newspaper mentions), (5) a state-wide economic development agency, (6) other government agencies, (7) industry groups, (8) universities, (9) business service providers, and (10), the excluded reference category, all other referral sources. This set of dummy variables allowed us to test whether the investment outcomes observed depend on the process by which new ventures became affiliated with the VDO (Baum, 2006; Van de Ven & Van Praag, 1981). To explore this possibility, we used the Heckman probit estimator (Baum, 2006) to model the following system:

$$\text{Capital}^{probit} = \beta_1\text{Distance to Urban Core} + \beta_2\text{Size} + \beta_3\text{Age} + \beta_4\text{University Proximity} + \beta_5\text{Product Introduction} + \beta_6\text{Commercial Property} + \beta_7\text{Managerial Experience} + \beta_{8\text{-}11}\text{Location Dummies} + \beta_{12\text{-}18}\text{Industry Dummies} + \mu_1$$

$$\text{VDO Affiliation}^{probit} = \beta_1\text{Distance to Urban Core} + \beta_2\text{Size} + \beta_3\text{Age} + \beta_4\text{University Proximity} + \beta_5\text{Product Introduction} + \beta_6\text{Commercial Property} + \beta_7\ \text{Managerial Experience} + \beta_{8\text{-}11}\ \text{Location Dummies} + \beta_{12\text{-}18}\text{Industry Dummies} + \beta_{19\text{-}27}\text{Referral Dummies} + \mu_2$$

This system satisfies the exclusion restriction that the set of variables in the capital outcome equation is a subset of the variables in the second selection equation. In this check, we found the correlation parameter ρ was not statistically significant, suggesting that the results reported in Table 2 are not subject to undue selection bias. This indicates that the possibility that the VDO itself is responding to startups' signals is not having an adverse effect on the reported results.

Endogeneity bias. We then used a second type of model—recursive bivariate probit—to examine the reported results for endogeneity (i.e., reverse causality). The recursive bivariate probit procedure estimates the following system of equations:

$$y_1^{probit} = X_1\beta_1 + y_2 + \mu_1$$
$$y_2^{probit} = W_2\beta_2 + \mu_2$$

As with the selection equations, we specified the system of equations such that the variables in X are a subset of the variables in W. In this instance, if the correlation parameter, ρ, is statistically significant, it would suggest the results are subject to some level of endogeneity bias. Thus, we repeated the procedure described above using all predictors of interest (i.e., Product Introduction, Commercial Property, and Managerial Experience and VDO affiliation) as dependent variables in the second equation. In doing so, we found the correlation parameters, ρ, were not statistically significant, thus showing no evidence of endogeneity. One exception is that one of the recursive models in which product introduction was the DV for the second equation would not converge, so we could not draw definitive conclusions about the endogeneity of this particular signal. However, in reduced-controls models, the correlation parameter was not statistically significant, which suggests that our reported results are safe from the possibility of reverse causality.

DISCUSSION

New ventures seeking external capital can signal their quality to potential investors by affiliating with a third party, such as a VDO (Gulati & Higgins, 2003; Pollock et al., 2010). Our study advances understanding of this phenomenon by describing how third party affiliations work differently during early-stage financing, as compared to IPO. To do so, we incorporate a sensemaking perspective into signaling theory in order to describe how third party affiliations not only endorse startups but also magnify weak signals, thus helping potential investors make sense of the meaning of those signals in an otherwise noisy environment.

Startup companies that affiliate with a VDO have about a 25 percent chance of receiving external capital, whereas those with no such affiliation have less than a 4 percent chance (cf. Freear & Wetzel, 1990). Moreover, as we theorize, the biggest gains come when startups combine VDO affiliation with other signals that demonstrate their maturity and commitment. By moving into commercial property (Brush et al., 2001) and being affiliated with a VDO, for example, startups increase their chances of external capital acquisition success tenfold over those that do neither. Startups that introduce a new product onto the market (Petkova, 2012), together with VDO affiliation, are 15 times more likely to receive external capital than those that do neither. Lastly, the startups that were most likely to receive external capital were those that were both affiliated with a VDO and founded by a highly experienced entrepreneur (Stuart & Abetti, 1990). The combination of VDO affiliation and high managerial experience yielded a 71 percent chance of receiving external investment.

Contributions & Future Research

Foremost, our study endorses a rich, complex view of signals and their interpretation through receiver sensemaking. We theorize about how signals complement each other in the

context of early-stage financing. Many studies on new venture signaling assume that signals operate in isolation from one another such that the combined effects are additive (Busenitz et al., 2005; Filatotchev & Bishop, 2002); some have examined how new venture signals may be contingent on certain factors or work together in different ways (Gulati & Higgins, 2003; Lee et al., 2011; Pollock et al., 2010). We, however, argue that in the context of early-stage financing, third party signals can unlock the value of signals that might otherwise go unnoticed. Signaler characteristics and actions demonstrate the entrepreneur's resolve and show they are likely to have certain capabilities and resources that may not be readily observable. Such signals might normally languish among the noise of early-stage new ventures, but become meaningful when a reputable third-party, such as a VDO, has affiliated with the firm and investors are able to make sense of the firm's characteristic and action signals, reducing uncertainty, resolving ambiguity, and overcoming a noisy signaling environment.

From a theoretical perspective, our emphasis on early-stage financing caused us to approach signaling theory from sensemaking perspective (Weick, 1995). Early-stage financing, compared to later stages, changes the nature of the signaling process under investigation. At IPO, receivers are dealing with a bounded choice set, highly regulated information, and a set of receivers with essentially all the same information (Certo et al., 2003). The context of initial external funding is precisely the opposite: there are myriad investment opportunities, information from the new ventures is uncertain, and there is tremendous variation in which receivers know what information (Cassar, 2004). This results in a noisy environment, where it is difficult for weak signals to rise above the noise.

To extend this work, scholars might build on our integration of sensemaking and signaling theory. This could go in a wide range of directions. For instance, from a sensemaking

perspective, schema are patterns of thought that organize a person's assumptions and knowledge (Thomas, Clark, & Gioia, 1993). Individuals rely on schema to react to phenomena, such as incoming signals, as they are encountered (Weick, Sutcliffe, & Obstfeld, 2005). However, scholars have shown that observers use different schema to evaluate information about issues of competence than they use to evaluate information about integrity (Ferrin, Kim, Cooper, & Dirks, 2007; Rouleau & Balogun, 2011). Kim, Ferrin, Cooper, & Dirks (2004: 106) note, "hitting a home run once makes us home run hitters in the eyes of others even if we strike out afterward. In contrast, embezzling from a company once makes us an embezzler even if we do not engage in additional thefts." Given this asymmetry in how people process information, we expect that the sensemaking role of third party affiliations could be different for signals about an entrepreneur's competence versus their integrity.

Future research could also add to our knowledge of early-stage signaling by examining other signals that might be important at this stage. For instance, new signals, such as family member endorsement or keywords in the business plan, might come to the fore. There might be important contingencies here as well. For example, given investors' focus on urban areas, geography could be an influential signal for new ventures that require human, financial, and knowledge capital. Given the large number of potential signalers and the noisy environment at this stage, firms might favor signal observability over costliness, and this might be truer in some scenarios (e.g., high-velocity industries) than in others. Future studies might also consider how signaling works at even earlier stages, when entrepreneurs are pursuing funds from family, friends, and their own social contacts (Kotha & George, 2012). Signaling at a very early-stage may swing the pendulum back toward a more defined set of investment choices, more reliable information, and more observable signals.

Limitations

There are also a number of limitations to our study that are worthy of mention. One limitation is that we hypothesize about managerial experience, which could be managerial experience in a variety of contexts. Startup experience is different than managerial experience, and senior managerial experience is different still (Stuart & Abetti, 1990). We, unfortunately, were unable to make these distinctions, but expect they could be important to potential investors. Further, while our operationalization is a count of the number of firms with which the founder has been involved, operationalizing this in years, according to the size of the firms involved, and depending on whether the manager's involvement ended in success or failure, would provide a more granular look at managerial experience.

A second limitation is that our study includes several binary variables, which are crude measures. These types of measures are broadly consistent with our theorizing about signalers versus non-signalers that do or do not reach the milestone of attaining external capital investment. However, future research might build on these ideas to explore how these relationships change when taking into account signal strength by using count or continuous variables (e.g., Pollock et al., 2010). For example, our product introduction signal could be refined by taking into account sales, market penetration, number of markets entered, or the number of products the venture has introduced. Refinements of commercial property as a signal might explore whether the property is class A, B, or C (Wiley, Benefield, & Johnson, 2010), zoning type, traffic flow, whether the property is leased or owned, the lease term or value of the property, or whether the venture has multiple locations.

A third limitation is that our study did not allow us to study the possible role of time and the sequencing of signals on the interaction among third-party affiliations and pedestrian,

ambiguous signals (cf. Janney & Folta, 2006). Thus, we can only draw conclusions about when signals are, or are not, operating together, but we do not know which signals came first. This limitation represents an opportunity for future research. For example, some have found that the benefits of being affiliated with a high reputation venture capital firm are strongest in the earliest stages of the venture (Lee et al., 2011). Scholars might build on this to explore differences when a venture acquires a characteristic or action signal before, simultaneous to, or after becoming associated with the prestigious third party.

CONCLUSION

Of the 700,000 new ventures started each year in the United States, less than 5% will evolve into a medium-sized firm (Barringer, Jones, & Neubaum, 2005). This fact has precipitated a number of studies seeking to explain why some ventures grow while others do not (Gilbert et al., 2006). One of the most important milestones determining success resides at the point where entrepreneurs have exhausted the financial backing of their own social circles and are forced to reach out for external capital investment (Lee et al., 2001). Given that the vast majority will be unsuccessful at doing so, our study describes how entrepreneurs can improve their chances. We suggest that affiliating with a third party is the first key to success in the crowded and noisy environment of early-stage financing, and that these affiliations unlock the power of more mundane signals by allowing them to be interpreted positively by potential investors.

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TABLE 1 – Descriptive Statistics and Correlations of Study Variables

	Variables	Mean	s.d.	1	2	3	4	5	6	7	8
1	Capital Received (dummy coded)	0.14	0.35								
2	VDO Affiliation (dummy coded)	0.34	0.47	0.43							
3	Managerial Experience (count)	0.49	0.93	0.11	0.11						
4	Product Introduction (dummy coded)	0.14	0.35	0.29	0.34	0.03					
5	Commercial Property (dummy coded)	0.51	0.50	0.18	0.16	0.11	0.09				
6	Size (natural log, number of employees)	0.87	1.24	0.03	0.03	0.11	0.05	0.20			
7	Age (years)	7.45	2.39	-0.02	-0.10	0.01	-0.27	0.01	0.03		
8	Distance to Urban Core (miles)	18.90	25.96	-0.09	-0.07	-0.05	-0.06	-0.16	-0.10	0.03	
9	University Proximity (dummy coded)	0.26	0.44	0.11	0.15	-0.03	0.11	0.13	-0.01	-0.02	-0.10

N = 986. Correlations exceeding |.06| are significant at $p < 0.05$.

TABLE 2 – Results of Logit Regression for Signals and Investment Outcome

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variables	β (s.e.)	**a.m.e.**	β (s.e.)	**a.m.e.**	β (s.e.)	**a.m.e.**	β (s.e.)	**a.m.e.**	β (s.e.)	**a.m.e.**	β (s.e.)	**a.m.e.**
Size, Logged	0.027 (0.04)	**0.003**	-0.087 (0.85)	**-0.008**	-0.087 (0.09)	**-0.008**	-0.088 (0.09)	**-0.008**	-0.087 (0.09)	**-0.008**	-0.086 (0.09)	**-0.008**
Venture Age	-0.034 (0.06)	**-0.004**	0.085 (0.05)†	**0.008†**	0.086 (0.05)†	**0.008†**	0.078 (0.05)†	**0.007**	0.083 (0.05)†	**0.007**	0.077 (0.05)	**0.007**
Distance to Urban Core	-0.027 (0.01)**	**-0.003****	-0.018 (0.01)	**-0.002†**	-0.018 (0.01)	**-0.002**	-0.019 (0.01)†	**-0.002†**	-0.019 (0.01)	**-0.002**†	-0.019 (0.01)†	**-0.002**†
University Proximity	0.623 (0.16)**	**0.081****	0.224 (0.14)	**0.021**	0.239 (0.13)†	**0.022†**	0.212 (0.14)	**0.019**	0.225 (0.15)	**0.020**	0.226 (0.13)†	**-0.020**†
Managerial Experience			0.196 (0.04)**	**0.018****	0.105 (0.12)	**0.018****	0.195 (0.04)**	**0.017****	0.189 (0.04)**	**0.017****	0.109 (0.13)	**0.018****
Product Introduction			1.163 (0.13)**	**0.124****	1.169 (0.13)**	**0.125****	-0.114 (1.23)	**0.091****	1.174 (0.13)**	**0.125****	-0.048 (1.23)	**0.091****
Commercial Property			0.664 (0.17)**	**0.059****	0.651 (0.16)**	**0.058****	0.689 (0.18)**	**0.061****	0.271 (0.46)	**0.060****	0.343 (0.43)	**0.061****
VDO Affiliation			2.394 (0.19)**	**0.249****	2.312 (0.26)**	**0.248****	2.244 (0.21)**	**0.250****	2.048 (0.40)**	**0.247****	1.877 (0.39)**	**0.248****
VDO Affiliation x Managerial Experience					0.131 (0.18)	**0.039***					0.119 (0.20)	**0.032**†
VDO Affiliation x Product Introduction							1.406 (1.30)	**0.271****			1.351 (1.31)	**0.259****
VDO Affiliation x Commercial Property									0.544 (0.59)	**0.139****	0.465 (0.57)	**0.129****
Intercept	-1.80 (0.63)**		-4.44 (0.46)**		-4.40 (0.42)**		-4.31 (0.44)**		-4.19 (0.64)**		-4.06 (0.58)**	
Log-Likelihood	-385.7		-288.7		-288.6		-287.6		-288.2		-287.0	
χ^2	347**		1198**		1156**		3528**		2458**		14233**	

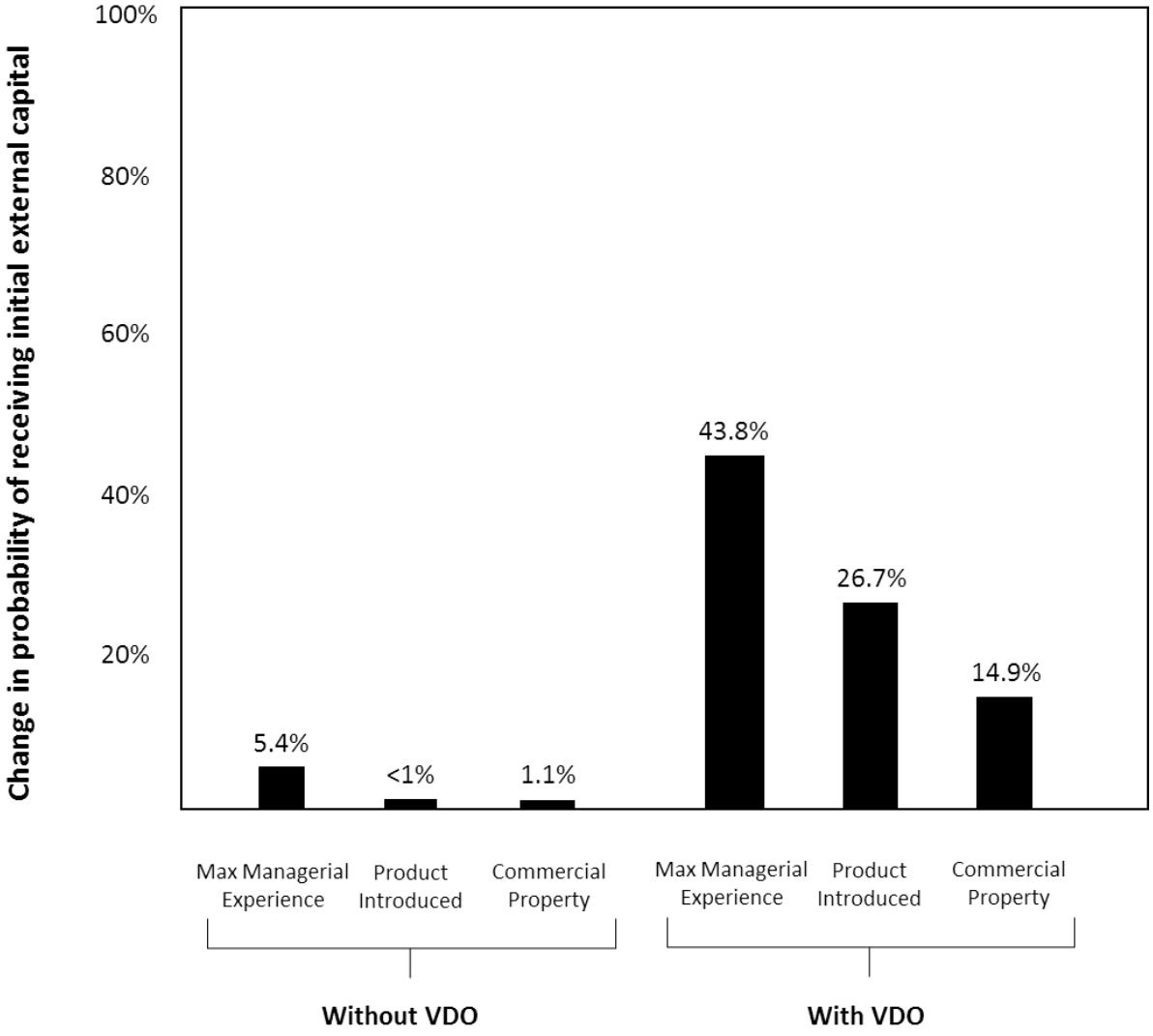
For all models: N = 986, robust/clustered standard errors, industry and sector dummy variables included but not reported, two-tailed significance tests.

† $p < 0.10$

* $p < 0.05$

** $p < 0.01$

FIGURE 1 – Interaction Effects of VDO Affiliation with Managerial Experience, Product Introduction & Commercial Property



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