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# Signaling in Venture Capitalist—New Venture Team Funding Decisions: Does It Indicate Long-Term Venture Outcomes?

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**According to signaling theory, new venture teams (NVTs) can communicate to venture capitalists and other potential investors both a "value" signal and a "commitment" signal, based on the level of personal investment in a venture. Venture capitalists (VCs) typically want to know if a NVT is really committed to a venture and if its members truly believe that a venture has wealth creating potential. Team members can convey signals via their investment behavior. We test our hypotheses based on a sample of 183 VC-backed ventures that we tracked over a ten-year time period. These data indicate that the signals sent to VCs in the early stages of the funding process do not appear to have any significant relationship with long-term venture outcomes. We explore possible explanations for these findings, as well as their implications for signaling theory and future research.**

## Introduction

New venture teams (NVTs) pursuing high growth potential opportunities often need to obtain equity financing from outside investors. Given the uncertainty and imperfect information that typically surround these investment opportunities, potential investors must invest numerous inferences regarding their prospects. Before a venture capital firm (VC) invests, it must price the venture equity at a level that meets its yield targets while also being attractive enough for the NVT members, regardless of its terms and conditions. Moreover, NVTs possess more information than outsiders regarding a venture's prospects (Amit, Glosten, & Muller, 1990; Prasad, Bruton, & Vozikis, 2000), which complicates consummating a mutually acceptable financing arrangement.

Given the intimate knowledge that NVTs should have of their ventures, it becomes virtually impossible to communicate all that they know that could be useful to a VC

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(Williamson, 1991). Expecting the exchange of all knowledge about a specific venture is unrealistic, particularly given the specific knowledge that is often embedded in the skills and capabilities of the founders (Alveraz & Busenitz, 2001). Some of this tacit knowledge may even be unrecognized by the NVT members themselves (Barney, 1991). As a result of the information asymmetries that exist between NVTs and potential investors, NVTs can offer credible signals regarding the prospects of a venture and their commitment to it in order to attract venture capital (VC) financing. This study develops hypotheses which suggest that NVTs can signal to potential investors the expected future value of a venture based on signaling theory (Spence, 1974; Levy & Lazarovich-Porat, 1995; Janney & Folta, 2003).

A VC's decision to invest in a specific venture is more than an evaluation of a given venture's business model; it also takes into account the NVT members and numerous other criteria (MacMillan, Siegel, & Narasimha, 1985; Zacharakis & Meyer, 1998). Given the information limitations of outside investors, together with the uncertainty that usually surrounds high-growth potential ventures, it is not a trivial task for VCs to evaluate signals of team competence and perseverance.

This research investigates whether the use of signals available to outside investors can be used to predict a venture's outcome. More specifically, we investigate whether the wealth and experience of the NVT can serve as credible signals of the future value of a venture. We focus on signals available to VCs at the time of funding.

## Asymmetric Information and Signals

As already noted, the existence of information asymmetries is a central issue in the relationships among NVT members and VCs. If the market for information about new ventures were efficient, NVTs and VCs could be perfectly informed as they negotiated with each other about the cost of equity financing and the terms and conditions that will govern their relationship. In fact, there would not be much negotiating because all parties would understand the relevant issues. In a world with perfect information, failure to reach agreements would stem from a clear understanding of errant motives or because the relevant parties held competing self-interests. Misinformation or uncertainty about the future state of the world in which they will do business would not be an issue. Unfortunately, perfect information is rarely if ever possible, particularly in the context of entrepreneurial endeavors. The decision to invest in a new venture with its associated risks is central to what venture capitalists and NVTs do (Amit, Brander, & Zott, 1998; Fiet, 1995; Zacharakis & Meyer, 1998).

The presence of asymmetric information is a fundamental assumption of signaling theory (Spence, 1974; Levy & Lazaraovich-Porat, 1995; Certo, 2003). In the absence of perfect information, decision-makers often look to various indicators to signal what future outcomes are likely to be. Asymmetric information can be reduced by NVT members sending credible signals to potential investors (Janney & Folta, 2003; Morris, 1987). Signaling theory assumes that the inside parties or NVT members know more about the future prospects of a venture and their own commitment to it than outside investors are ever going to know (Keasey & Short, 1997; Marshall, 1998). Those NVTs with a superior business concept and a competent team to oversee the venture are likely to be under-funded unless they can communicate their competence to potential investors. Using signals to communicate about a venture and the team leading it can indicate a venture's likelihood for success (Morris, 1987). But to be effective, a signal must be able to indicate differences among very competent and less competent NVTs (or sellers of

business equity). Signaling theory presupposes that signaling costs are inversely related to the unambiguous nature of the signals. Moreover, a signal's veracity must be continually re-evaluated after the equity purchase (Morris, 1987).

One of the critical challenges for a NVT is for its members to send out signals that assist VCs to overcome the asymmetric information surrounding a deal. Venture capitalists typically go through multiple stages in their examination and decision processes (Wright & Robbie, 1998). The communication of signals may be particularly important during the early screening, valuation, and due diligence stages. Due diligence often evaluates intangible assets, such as tacit knowledge, together with tangible assets. Clearly, evaluating these different types of assets can cause substantial variance in the time and money required to perform the evaluations (Harvey & Lusch, 1995). Some have argued that it may be to an NVT's advantage not to disclose information that may reduce the value of a venture (Leland & Pyle, 1977; Amit, Glosten, & Muller, 1990). Unfavorable information could increase the cost of equity or even truncate the funding process entirely. Either way, NVTs "must convincingly reveal the value of their venture to potential investors in order to obtain financial support" (Prasad, Bruton, & Vozikis, 2000, p. 168). The more positive a venture's signals, the more likely it is that VCs can reduce the time and money invested in the due diligence process by VCs (Harvey & Lusch, 1995).

Given turbulent and changing conditions usually associated with high-growth potential ventures, it may be that the signals that a NVT sends are much more reliable than what they say because interpreting their motivations will always be a complex process. We define a *signal* as new information that may change our current understanding of a future state. Signals tend to be the most informative when they communicate actions because it's costly or impossible for less competent NVTs to transmit them ceaselessly (Morris, 1987). Clearly, signals embedded in actions such as investments are much more credible than words and verbal promises. According to signaling theory, an available signal must be observable and known in advance of an actual investment (Certo, Daily, & Dalton, 2001; Janney & Folta, 2003). VCs require access to this information during the inquiry and the due diligence stages so that inferences from these signals can be made (Wright & Robbie, 1998; Harvey & Lusch, 1995).

NVTs can signal the financial potential of their ventures to outside investors by their own investments of money and experience (Leland & Pyle, 1977). We assume that the commitment of NVT members to a venture is a reflection of their private knowledge about it, regardless of their forthrightness in disclosing it. To the extent that a venture's financial success is an informational problem, signals provide a means for outsiders to make judgments and predictions about actions, in this case the future of a venture. Following the lead of Prasad, Bruton, and Vozikis (2000), we focus on two types of trust-creating signals: value signals and commitment signals. Legal covenants can and are used by VCs to protect their investments (Sahlman, 1990), but such covenants can be costly and only partially effective.

## Signaling Theory and Venture Evaluation

Signals of value and commitment have the potential to provide more reliable predictors of a venture's prospects than legal covenants or other ostensible indicators (c.f., Sahlman, 1990). We now develop specific hypotheses regarding value and commitment signals.

## Signals of Value

NVTs usually pursue innovations in an attempt to penetrate new markets and obtain substantial rents. Prospective investors want to understand the potential value that a NVT sees in a firm. *Value* signals refer to potential rents from a venture. If NVT members see great potential in a venture, they are more likely to retain as much of the firm's equity as possible. Although NVTs are often overconfident in the future value of their firms (Busenitz & Barney, 1997; Simon & Houghton, 2003), an underinvestment is likely to be a negative signal for future returns on investment. The amount of equity held by a NVT represents a potentially positive signal of the future value of a firm (Leland & Pyle, 1977; Prasad, Bruton, & Vozikas, 2000). Minimal equity positions held by a NVT may signal that its members have little personal confidence in the future value of the venture, or worse yet, are attempting to raise money for a venture that they know will ultimately fail.

NVTs can communicate value signals to potential investors in several ways (Leland & Pyle, 1977). It is one thing to provide verbal projections about the future potential of a venture; it can be quite another to take an equity stake in one that backs up an optimistic forecast. A NVT's amount of equity ownership constitutes a potentially informative signal of a venture's true value, which is typically manifested at the time when a venture is taken public. It is usually only after a venture is taken public that a VC can redeem its equity investment by exiting from a deal.

**Hypothesis 1:** The percentage of venture equity held by a NVT will be positively related to performance as reflected in venture exits.

## Signals of Commitment

*Commitmen*t signals refer to the determined actions of NVTs to overcome obstacles and achieve venture success. Because NVT members often possess very limited funds, they are frequently unable to purchase an amount of equity, which would reflect their true confidence in the venture (Prasad, Bruton, & Vozikas, 2000). If a NVT member has a net worth of $50,000 and invests 80% of it in a venture, this could represent a rather small percentage of total venture funding, but a substantial personal commitment. In such cases, the low equity holdings by a founder would not accurately represent his or her level of commitment (Prasad, Bruton, & Vozikas, 2000).

Leland and Pyle (1977) rely on the simplifying assumption that NVTs would have unlimited wealth. Because NVT members generally possess limited initial wealth (Amit, Glosten, & Muller, 1990), the amount of their stock may not be a valid "value" signal. Prasad, Bruton, and Vozikis (2000) add that "an entrepreneur's shareholding level as a signal of value may not always provide an accurate perception because an entrepreneur's limited initial wealth and consequently low shareholding level could not adequately reflect the true value an entrepreneur expects from a project" (p. 170). Prasad, Bruton, and Vozikas (2000) suggest that a more reliable measure of the value of a new venture is the proportion of the initial wealth of NVT members invested in the venture.

Given these two perspectives on how entrepreneurs can signal value and commitment, we test the Prasad, Bruton, and Vozikas (2000) measure to compare its support for signaling theory with that provided by the simplifying assumption of unlimited initial wealth. In this instance, we use NVT members as the test sample.

**Hypothesis 2:** The percentage of individual wealth that NVT members invest in a venture will be positively related to performance as reflected in venture exits.

As with the previous hypothesis, venture exits are important because they capture all of exits, from those ventures that perform very poorly to the highly successful.

## Methodology

### Data Collection and Time Horizon

We identified 837 ventures that received venture capital financing in the 1987–1989 editions of the *Venture Capital Journal*. We used surveys to collect initial information about the venture firms and to identify the venture capital firms that provided first round financing. From the surveys mailed in early 1990, we received replies from 235 firms, for a response rate of 28 percent. Thirty of these firms indicated that they received funding exclusively for seed money or for a leveraged buyout, and consequently, did not qualify for this study. These procedures yielded a final sample of 205 firms. We obtained additional data from the *Venture Capital Journal* to check for possible response bias, however there were no significant differences between respondents and nonrespondents with regard to the amount of funding [$F_{(1,688)} = 1.53$, $p = 22$] or the stage of funding [$X^2_{(5,N=779)} = 7.672$; $p = .17$]. We also evaluated the representativeness of the sample by comparing the lead VCs in this research with those examined by Gupta and Sapienza (1992). There were no significant differences in industry investment preferences ($t_{351} = 1.58$, $p > .05$) or geographic preferences ($t_{351} = 0.61$, $p > .05$).

### Dependent Variable

Based on previous research (Ruhnka, Feldman, & Dean, 1992; Manigart, Baeyens, & Van Hyfte, 2002; Busenitz, Fiet, & Moesel, 2004), we categorized the final disposition of VC-funded ventures as: (1) *out-of-business*, (2) s*till-private*, (3) *merged or acquired*, and (4) *IPOs.* This categorical approach was chosen because continuous measures of performance are readily available only for IPO firms, thus eliminating the inclusion of out-of-business, still-private, as well as ventures that have been acquired by another firm. This categorization represents a way of capturing the outcomes of all ventures that have received VC funding (Ruhnka, Feldman, & Dean 1992; Gladstone, 1989).

To determine a venture's exit status, we searched the Lexis-Nexis business database, specifically the *business news* and *company financial* sections. Lexis-Nexis catalogues stories about both publicly and privately held ventures from such sources as news articles, wire and transcript articles, magazines and trade magazines, newsletters, journals, disclosure reports, and bankruptcy reports. We also recorded the year that a change in a venture exit status occurred. We classified a firm as *out-of-business* if a report/article indexed by Lexis-Nexis explicitly stated this to be the case or if no trace of information was found on the specified firm for at least two consecutive years. As a final check, we examined the online business phone directory at "http://www.switchboard.com" for a possible listing before a firm was categorized as *out-of-business.*

### Independent and Control Variables

To measure the amount of equity held by a NVT for testing the first hypothesis, we asked respondents what the percentage of total outstanding shares were held by the employees of the firm. We labeled this variable *NVT equity* (We assumed that virtually all

of the shares held by employees were held by the NVT). We measured *founding experience* as the percentage of key managers who had experience with one or more previous business start-ups. *NVT experience with VCs* was coded as "1" if one or more members of a venture team had worked for an earlier VC-backed venture and "0" if none had done so. We measured *NVT industry experience* by calculating the average number of years NVT members had worked in the current venture industry. *NVT wealth invested* was measured by asking respondents to note the percentage of net worth of key managers in their company immediately before it received first round financing. The responses for each manager were then averaged for the score used here to test hypothesis 2.

Numerous control variables were used to rule out alternative explanations. The availability of venture capital tends to be quite cyclical. To allow for market cyclicality, we controlled for the year of first round funding. Only ventures launched during 1988 and 1989 exerted a statistically significant influence, so we collapsed these two years into one variable representing the *first round funding era*.

To consider the impact of NVT investments, it is important to control for the amount of funding that was raised at the time of receiving first round venture capital financing. *First round funding amount* is the total amount of capital raised in first round venture capital financing. We also controlled for *venture age* by inserting the year the firm was founded. Because the size and early performance of a venture could exert more influence on a venture's final disposition, we controlled for *venture size, which we did* by noting the annual sales for the first full year after first round funding.

We also controlled for several NVT experience factors. We measured the *firm-specific skills* by asking, "How easy would it be for key managers in your company to apply the same managerial skills in other organizations?" Another measure of human capital specificity related to the transferability of "technical/engineering skills." We assessed the answers to these two questions about human capital on a scale ranging from "All could easily be transferred" (1) to "None could be easily transferred" (4). We combined these two items and divided by two to find their mean.

## Data Analysis

We collected data on venture outcomes over a ten-year period. The collection and analysis of this sort of data required special care. Besides being quite intolerant to missing values, some ventures that were *still private* could change to *out of business*, *merged*, or an *IPO*, which would create a right censoring problem. In addition, a change in the timing of the status changes of only a few ventures could have a major impact on the interpretation of results. Finally, a firm that undergoes an IPO after only two years is more likely to be profitable than one that takes nine years. We used an event history analysis to accommodate the time sensitive nature of the longitudinal data (Allison, 1984, 1995; Yamaguchi, 1999).

In event history analysis, the dependent variable is the hazard rate, which is a function of the probability that a firm in the risk set will have a particular outcome during a particular time interval. We calculated the hazard rate by multiplying a venture's status by the number of years from the beginning of the study to the year of change.

# Results

Table 1 contains the Spearman correlations, means and standard deviations for the variables used in this study.

Table 1

Means, Standard Deviations, and Correlations

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Venture exits | | | | | | | | | | | |
| 2. First round funding era | −.14 | | | | | | | | | | |
| 3. First round funding amount | .29** | .07 | | | | | | | | | |
| 4. Venture age | .01 | .51** | .11 | | | | | | | | |
| 5. Venture size | −.02 | −.01 | .05 | −.31** | | | | | | | |
| 6. NVT founding experience | .07 | .03 | .16* | .04 | −.15 | | | | | | |
| 7. Firm-specific skills | −.15* | −.04 | −.03 | −.08 | .10 | −.14 | | | | | |
| 8. NVT experience with VCs | .10 | .03 | .21 | .03 | −.09 | .53** | −.04 | | | | |
| 9. NVT industry experience | .03 | −.14 | .11 | .01 | −.15 | .10 | −.21** | .13 | | | |
| 10. NVT wealth invested | −.02 | −.07 | −.24** | −.25** | .31 | −.05* | .11 | −.16 | −.06 | | |
| 11. NVT equity | −.15* | −.25** | −.42** | −.30** | .12 | .01 | −.05 | .01 | .07 | .29** | |
| Means | 2.75 | 0.48 | $2.7 M | 5.1 | 4.54 | 0.21 | 1.82 | 0.45 | 13.8 yr | $13.5 | 36.7% |
| Standard Deviations | 1.15 | 0.50 | $2.1 M | 3.2 | 8.8 | 0.31 | 0.63 | 0.50 | 5.9 yr | $20.2 | 20.1% |

*$p < 0.05$, **$p < 0.01$.

Table 2

Change in Venture Capital Backed Firm Status

| | Year of Venture Status Change | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | Total |
| IPO | 3 | 9 | 12 | 15 | 10 | 5 | 6 | 4 | 3 | 1 | 67 |
| Acquired | 2 | 4 | 3 | 2 | 5 | 4 | 4 | 6 | 2 | 4 | 37 |
| Out-of-Business | 4 | 9 | 12 | 3 | 4 | 1 | 2 | 0 | 0 | 0 | 35 |
| Living Dead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| Total by Year | 9 | 22 | 25 | 20 | 19 | 10 | 12 | 10 | 5 | 5 | |

Table 2 details the dependent variable and changes in venture firm status. Following a similar analysis conducted by Kaplan (1991) and Wright, Thompson, Robbie, and Wong (1995), we wanted to understand the pattern and nature of VC exits. Along the horizontal axes, we indicate the year in which the change in venture statues first occurred and along the vertical axes we show the type of exit that occurred. With first round funding occurring in 1989 or before, we started tracking possible exits in 1990 and continued for ten years. The ten year timeframe was chosen because this encompasses the length of time needed by VCs to complete their cycle. When VCs raise money for a specific investment fund, they often retain the investment capital for a couple of years until they identify suitable ventures. Most VCs project exiting a venture within 6 years, and for sure within 8 years. As shown in Table 2, the number of exits increases over the first several years and

Table 3

Bivariate Analysis of Entrepreneur Signals and Venture Exits

| | 1<br>Out-of-Business | 2<br>Still-Private | 3<br>Merged or Acquired | 4<br>IPO |
|---|---|---|---|---|
| Hypothesis 1: | | | | |
| NVT Equity Held | 34.9% | 43.2% | 41.9% | 31.2% |
| | (17.3) | (24.1) | (21.4) | (16.8) |
| Hypothesis 2: | | | | |
| NVT Wealth Invested | 12.2 | 15.8 | 14.3 | 12.5 |
| | (20.1) | (22.2) | (20.7) | (19.7) |

*Notes*: *The* number of observations in each category are as follows: "*Out-of-Business*" = 36; "*Still-Private*" = 44; "*Merged or Acquired*" = 36; "*IPO*" = 67.
The standard deviations are in parentheses.

peaks in 1993 at 29 and then gradually declines fairly consistently through 1999. Both out-of-business and IPO exits individually peaked in 1993 but acquisition exits occurred much more consistently throughout. In eight out of the ten years, there were at least three acquisitions but never were there more than six. To test this statistically, we used a multinomial logit model as suggested by Allison (1995). The variable *years* (or number of spels to the change in venture classification) was significant ($\chi^2 = 20.13$; $p < .001$), indicating significant, nonproportional differences in the hazard functions.

Table 3 contains the overall means and standard deviations for the independent variables across the four types of venture exits: (1) *out-of-business*, (2) *still-private*, (3) *merged or acquired*, and (4) *IPO*. The procedural justice and dismissal variables are associated with the most noticeable differences in venture status, as indicated in Table 3.

We used Cox regression to conduct an event history analysis of venture exits. This semi parametric method is quite robust in its accommodation of nonproportional hazards, which it does by including time as part of the interaction term in the dependent variable (years X venture exits—essentially the data shown in Table 2). Cox regression also uses a maximum partial likelihood approach, enabling the estimation of β coefficients. Because we had numerous ties among cases of the dependent variable (e.g., ventures in the sample having an IPO in the same year), we invoked the "exact" SAS option as suggested by Allison (1995). The results of the Cox regression analysis are shown in Table 4.

We were unable to find support for the first hypothesis, which tested NVT equity. In looking at the percentage of equity held by the NVT at the time of first round funding, there is apparently no systematic effect across the four categorical outcomes of IPO, acquired, still private and out-of-business.

These data also failed to support the second hypothesis, which tested the percentage of individual wealth invested. There is apparently no significant relationship between the percentages of individual NVT member wealth invested in a venture and its eventual disposition. The findings from testing both of these hypotheses do not support the predictions of signaling theory nor the positive effects predicted for NVT investments.

Table 4

Cox Regression Analysis Testing VC Experience

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Parameter | β | s.e. | β | s.e. |
| H1: NVT equity | 0.01 | 0.01 | | |
| H2: NVT wealth invested | | | –0.01 | 0.01 |
| Control Variables: | | | | |
| First round funding era | –1.01** | 0.26 | –0.99** | 0.26 |
| First round funding amount | 2.33** | 6.37 | 2.20** | 5.84 |
| Venture age | –0.03 | 0.05 | –0.05 | 0.05 |
| Venture size | 0.02* | 0.01 | 0.01 | 0.01 |
| Firm-specific skills | –0.48* | 0.28 | –0.59* | 0.24 |
| NVT founding experience | 0.96+ | 0.57 | 0.99 | 0.55 |
| NVT experience with VCs | 0.01 | 0.28 | 0.01 | 0.27 |
| NVT industry experience | –0.04* | 0.02 | –0.04 | 0.02 |
| Model chi-square for covariates | 40.7*** | | 37.93*** | |

$+p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

## Discussion

Given the information asymmetries that exist in new firms, NVTs must signal to communicate to VCs and other potential investors about their venture's value and their commitment to it, based on their own financial investments in a venture. VCs typically want to know if a NVT is committed to a venture and if its members truly believe that a venture has great potential. NVTs can communicate via their own investments the future potential of a venture. A NVT's amount of share ownership and the proportion of individual wealth invested in a venture should theoretically communicate its *commitment*, as well send an important *value* signal.

This research represents the first known field study to empirically examine phenomena explained by signaling theory. Furthermore, this study utilizes venture outcome data on VC-backed firms collected over a long-term horizon. Although most signaling studies are theoretical, some empirically based research is starting to surface (e.g., Levy & Lazarovich-Porat, 1995; Certo, Daily, & Dalton, 2001). We predicted that the amount of ownership equity and personal net worth invested in a venture by NVT members would be a signal of commitment to a venture as well as a venture's long-term value. However, this study did not find support for either type of NVT investment. Even after controlling for alternative explanations, the proportion of NVT equity at the time of first round VC funding and the percentage of personal net worth invested in the firm prior to first round VC funding had no significant effect on the long-term venture outcomes. These findings do not support recent laboratory findings (Levy & Lazarovich-Porat, 1995) not signaling as is alleged to exist in publicly traded firms (Janney & Folta, 2003).

## Empirical Implications

These findings raise numerous questions regarding the study itself and the potential insights offered by signaling theory as it applies to the VC-NVT relationship. When nonsignificant findings emerge from a study, probing for an empirical and/or theoretical rationale logically follows. We now discuss empirical questions that arise with the sampling frame, measurement, and analyses.

We used a U.S.-based sample of firms that received VC funding in the 1984–89 time frame. Tests for a biased response from this sample proved to be negative. However, VC funding is cyclical and it is possible that different results might be obtained if a comparable study were conducted in another time frame or another country.

This study focused on NVT members and their aggregate equity stake in a venture, as well as their average amount of personal wealth invested. Although *forming* a team of entrepreneurs *to* found a venture is usually considered advantageous, it is possible that the investments made by the top entrepreneur (CEO/president) would be more consistent with signaling theory than the aggregate team investments made in the venture. Consequently, we conducted a post-hoc analysis of the investments made by the top entrepreneur. However, this analysis was nonsignificant.

## Theoretical Implications

The lack of support for this study's hypotheses and signaling theory raises some challenging theoretical issues. Although a lack of empirical support does not disprove a theory, this study's longitudinal design provides evidence to challenge conventions thinking and to offer suggestions for future research.

Even though this study's results were unexpected, they clearly draw attention to an unaddressed question—"Do VCs look for richer signals that essentially substitute for the traditionally examined financial investment signals?" Perhaps VCs develop a richer set of evaluation tools and heuristics about the future potential of a given venture and the motivation of the entrepreneurs to see their venture succeed. Such tools could conceivably offer more effective decision support when a VC takes the time to thoroughly investigate. For example, VCs may glean important signals from interactions with the NVT and their personal commitment to the venture.

We also think that it may be possible that different VCs will key in on a variety of signals and have differing views of the validity, interpretation, and importance of any one signal. It would be interesting to observe how each VC reacts to a particular signal and whether any of them attends to specific signals when investing. Furthermore, some signals may be treated as floor or ceiling thresholds only, whereas others may be treated as black or white (signal is on or off) or as continuous. For example, some VCs may believe that a NVT's equity makes little difference unless it drops below 10%, whereas others may believe it has a very limited effect beyond a certain level.

Finally, perhaps the information gap that is widely purported to exist among owners and managers of publicly trade firms (Jensen & Meckling, 1992) may be much smaller in the VC-NVT relationship. Once a VC has made an initial commitment, a due diligence process follows during which a detailed examination of the business is usually made. By the time an exchange of money occurs, the VCs may know so much about a business and its NVT that the information gap becomes relatively small. Financial signals may simply be too distant to be of much assistance to VCs and early stage investing. Future research could probe the extent of any information gaps between VCs and NVTs at the time of funding.

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