

Do Business Plans Predict Venture Funding?

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Abstract

Using a sample of funding proposals submitted to an American venture capital firm, we assess whether solicitation characteristics predict successful acquisition of venture funding. We improve on prior literature by a) using a large sample (722 proposals) of known representativeness and b) exploring the theoretical link between venture investment decisions and both solicitation characteristics and the contents of associated business planning artifacts. We find that social ties are critical in attaining venture funding. Conditional on their existence, some solicitation and team attributes help cue venture capitalists to valuable opportunities.

Keywords: Business Plans, Venture Capital, Entrepreneurship, Rare-Events Logit, Prototype Theory

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1. Introduction

Within the entrepreneurship community, the preparation of a business plan has long been treated as an essential milestone on the path to a successful new venture (Timmons and Spinelli, 2007). A key purpose of the business plan is to communicate legitimacy and thereby acquire financial and other resources that are critical for new firm development. However, recent research is split as to whether the production of a business plan facilitates firm survival and promotes profitability (Delmar & Shane, 2003, Honig & Karlsson, 2004). Business plan preparation is particularly salient in the acquisition of venture capital. For example, in the academy, business plan competitions co-sponsored by venture investors have proliferated, and MBA students commonly enter entrepreneurship courses with the expectation that they will be asked to prepare a business plan (Zwahlen, 2006).

Two potential benefits of business planning have been articulated in the literature (Delmar & Shane, 2003). First, business planning may help clarify goals and aims of a venture to the entrepreneur – and thereby guide decision making.¹ Second, the output of planning activities, such as business plans and executive summaries, may convey important information to potential stakeholders. The current paper evaluates whether, indeed, they do. To this end, we examine a large sample of business planning documents of known representativeness and ask whether the information contained in them is predictive of successful venture capital fundraising. Our central results are twofold. First,

¹ More explicitly, the business plan may serve as a guide for the entrepreneurial team in the implementation of a new venture (Timmons & Spinelli 2007; Baron & Shane 2005). In theory if all the participants had agreed upon what needed to be done and the venture required no additional resources, there would be no need for a written business plan.

unsolicited requests rarely receive venture capital funding. We interpret this to mean that, consistent with other entrepreneurship research (Stuart *et al.*, 1999; Sorenson, 2003), social networks are a *necessary* condition for the acquisition of venture capital funding. Second, conditional on receiving a solicitation through a known source, the evidence that the contents of planning documents influence VC decision-making is weak.

Three central views about the role of business planning documents and their relationship to external stakeholders have been articulated in the literature. Entrepreneurs use the business plan to represent and communicate a vision of the firm they intend to create. Like a good story, an effective planning document is memorable and unique, leaving the reader or recipient excited about the prospects of the proposed venture (Lounsbury & Glynn, 2001) and thus more inclined to invest resources in it. In this view, the planning documents contain salient information that is relevant to potential stakeholders in general and venture capital investors in particular.

The business plan may also serve symbolic functions in the exchange between entrepreneur and investor (Zimmerman & Zeitz, 2002). Following Mauss (1990 [1923]), the business plan can be seen as a ceremonial gift to the investor from the entrepreneur. In effect, the entrepreneur offers the potential investor the business plan in exchange for the investor's willingness to hear the entrepreneur's plea for funding. Is it well written? Is it the right length? Is it organized in accordance with commonly accepted norms? Does it look right? In this view, the contents of the plan matter less than its conformance with expectations.

For their part, practitioners have dismissed efforts to systematically evaluate the role of business plans. Each new venture is unique, and the process of venture evaluation is more art than science. This artistry is thought to lie at the heart of the competitive advantage of the venture investor. The true skill of the venture capitalist, in this view, is his or her ability to look past the plan and other strategic actions intended to manipulate or outwit the investor's proprietary and inimitable assessment processes. Hence, practitioners might argue that neither the form nor substance of a business plan is relevant to venture decision making. In effect, the practitioner view dismisses the basic premise of our study, that is, that there are some common factors that most venture capitalists look for in solicitations. If each venture capitalist uses only idiosyncratic criteria to evaluate potential targets, then any parsimonious theory would be wrong.

Our goal is to determine which, if any, of these views is most accurate. To this end, we examine the fate of a large, complete sample of business solicitations submitted to a single venture capitalist (hereafter, the "Focal VC"). By way of clarification, we do not draw conclusions by examining the decision making of a single venture capital firm; rather we exploit the fact that many of the businesses that solicited the Focal VC received funding from *other* venture capitalists. Therefore, our results are based upon a broad swath of venture capital decision makers. We evaluate the sample's representativeness according to Goldfarb *et al.* (2005). This allows us to understand the nature of biases in the sample and thereby interpret our results. Thus, we address the three most vexing problems that have limited studies of venture capital decision making. First, where prior

work has been limited to relatively small samples of reviewed business plans (e.g., MacMillan & Narasimha, 1987, Roure & Keeley, 1990), we observe a larger sample that allows us to develop and test more constructs using more advanced analytic methods. Second, where prior studies drew upon non-random samples or samples of unknown representativeness (MacMillan & Narasimha, 1987; Roure & Keeley, 1990; Roberts, 1991), we observe every solicitation that was entered into the Focal VC's record keeping system during the sampling period and business planning documents for a subset of these firms. These features of the data allow us to ascertain representativeness with statistical rigor. While our sample is still subject to potential bias with regard to the general population of ventures that solicited funding, we can characterize these biases explicitly. Third, where prior studies have relied upon self-reporting of decision-making criteria by venture capital investors (e.g., Hisrich & Jankowicz, 1990; Hall & Hofer 1993, Zacharakis & Shepherd, 2001; Mason & Stark, 2004), we observe the actual outcomes of venture decision-making.

Our results are instructive. We find that no requests for funding that arrived unsolicited to the Focal VC *ever* received funding from *any* venture capitalist. We interpret this as strong evidence of the importance of social ties. Conditional on access to a social network that includes venture capitalists, we find, depending on specification, that solicitations describing a) larger teams, b) founders with greater entrepreneurial experience, and c) founders with prior experience in more entrepreneurially prominent firms are more likely to receive venture capital funding. Also, in some specifications, we find that solicitations that d) include full business plans and request larger sums of

money, and e) do not report biographical information are more likely to receive funding. First, our results suggest that social ties are critical in venture capital fundraising. Moreover, our results also provide some prescriptive guidance as to what information to include in business plans. Our results are not consistent with the practitioner's view that venture decision making criteria are idiosyncratic across venture capitalists, but suggest that there are elements of truth in both the salient information and symbolic views.

The paper proceeds as follows: We develop our theory in Section 2. In Section 3 we describe the rare-events methodology we use in our analysis. In Section 4, we introduce our data. Results are reported in Section 5, followed by a discussion and a conclusion.

2. Conceptual Development

The venture investment decision is made under conditions of high uncertainty and strong information asymmetries. To mitigate the well-documented “lemons” problem (Akerlof, 1970) entrepreneurs seek to provide signals of underlying quality to venture capitalists. Building on Akerlof, Spence (1974) argued that employers use educational attainment as a proxy for critical but unobservable differences among potential employees. In the context of IPO investment, Sanders and Boivie (2004) suggest that “markets may use surrogate indicators of quality as effective sources of information cues that help to filter and screen new firms in emerging industries (169).” If investors in public companies are relying upon such signals – and IPO candidates are already much more advanced than companies seeking initial funding – investors in early stage companies are even more

likely to rely upon such cues in their *initial* screening decisions. Thus, the venture investor will rely upon observable signals to discern underlying quality of the investment target. Both the signal and the underlying attributes are important loci for research.

Screening, Heuristics and Prototype Theory

Signaling theory offers little guidance about the exact content of the relevant signal, noting only that for a signal to be meaningful, it must be costly to obtain and correlated with the underlying characteristics that are relevant to the decision maker (Spence, 1974; see Weiss (1995) for a review).² For venture capitalists the problem is complicated by the sheer volume of information the venture capitalist must process. Venture capitalists screen hundreds if not thousands of solicitations annually (Goldfarb *et al.*, 2005) forcing them to make fast decisions based upon incomplete information.

In this setting, venture capitalists must categorize incoming ideas into those that are more or less attractive. Applicable theories from cognitive science include prototype theory and cue validity. Prototype theory explains the likelihood that a particular object or description will be readily classified into pre-existing mental categories. This classification allows for the “induction of invisible features” when such objects or descriptions are not exact replicas of previous instances (Kruschke, 2005). However, subtle differences in objects can generate larger differences in meaning. For example, in a seminal work, Rosch (1975) finds that “chair” invokes the cognitive category “furniture”

² Signaling theory also presumes that full information would reveal the objective value of the underlying asset; however, in the venture capital setting, idiosyncratic risk is particularly high, and hence an objective probability of success is arguably unknowable.

with greater salience than does “table”. Thus, for business planning documents to be attractive to venture capitalists, its authors need be aware of these differences. Prototype theory, therefore, suggests that business planning documents possess attributes that facilitate classification along the attractive/non-attractive dimension.³

Such attributes must possess high “cue validity”. Cue validity is the likelihood that a piece of information is associated with a particular outcome and is measured on a scale of 0 to 1. For example, the cue validity that viewing lightning is associated with electrical discharge is 1. In contrast, the cue validity that viewing lightning is associated with rain is lower. An effective signal will, by definition, possess some cue validity and allow for quick information processing by appealing to existing cognitive associations in the mind of the decision maker (Rosch, 1975). Shepherd (1999), for example, argues that cognitive cues facilitate decision making among venture capitalists.

We view the solicitation process and the submission of associated business planning documents as an effort by the entrepreneur to cause the venture capitalist to categorize the associated business as attractive. Business planning documents and entrepreneurial behavior associated with the solicitation are potential cues to invoke this categorization. The researcher’s challenge, therefore, is to identify which information makes up relevant cues. To this end, we pursue the following strategy: if a given factor or attribute has been shown in the literature to be a determinant of new venture outcomes (i.e., predictive of

³ Prototype theory has been used frequently to explore managerial decision making. For example, Dutton & Jackson (1987) suggest that cognitive categorization enables managers to identify potential threats and opportunities. Porac, Wade & Pollock (1999) apply categorization theory to explain the processes by which executives establish peers to calibrate compensation. Prototype or categorization theory has thus far not been applied to the context of venture decision making.

the presence of funding, a successful business launch, or achieving growth and scale), then this same factor may, in principle, be a cue to professional venture investors. In the development of our formal hypotheses below, we focus attention on the logical link between the information in the artifact and the underlying success factor that has been identified in the literature. For the sake of brevity, we limit our reviews of the actual relationship between the factors and success.

The logical link between business planning documents, attribute of the venture, and entrepreneurial outcome requires several further assumptions. One must assume that business plans are carefully considered and crafted with the goal of acquiring external resources.⁴ Each statement appears in the business plan because the author(s) of the plan believed its inclusion would bring about the categorization of the venture into the “appropriate for funding” group. A corollary to this assumption is that business plans do not deviate from the actual attributes of the underlying venture, or if they do deviate, they do so systematically. As an example, if entrepreneurs are overly optimistic, then revenue projections will be biased upward, but if all investors know that entrepreneurs are optimistic, they will discount the projections accordingly. In this setting, if we identify a significant relationship between revenue projection and acquisition of funding, the fact that the expected revenue stream was believed by all to be lower than promised would not invalidate the underlying relationship between planning document and outcome. In contrast, if low quality entrepreneurs do not truthfully report their own personal histories,

⁴ Per note 1 above, business plans can serve multiple functions. Given the present sample and the environment from which it was drawn, our assumption about the search for venture capital funding is reasonable.

then we might not detect a significant connection between the underlying attributes of the founding team and the outcome of the venture.

Social Nature of the Interaction

In settings characterized by high levels of information asymmetry and uncertainty information arriving via social networks is likely to be viewed more favorably than information that arrives anonymously (Kilduff and Tsai, 2003; Shane, 2003:181-184 and references therein). Given the characteristics of venture capital decision making described above, this social network theory is clearly relevant. This leads to the following hypothesis:

H1: Businesses associated with solicitations that arrived through referral are more likely to receive venture capital funding.

Business Plan as Standard Artifact

Leading entrepreneurship texts strongly encourage business plan authors to follow conventional formatting when constructing a business plan and, moreover, are generally in agreement as to the information that should be included in a plan. These texts implicitly assume that conformity to a standard simplifies identification of particular cues that in turn facilitate categorization by decision makers. Given the opportunity cost of a venture capitalist's time, the extra cost of extracting cues from a non-standard artifact may increase the probability that the opportunity associated with such an artifact is

categorized as “unattractive” (Shepherd 1999). This discussion leads to the following hypotheses:

H2a: Ventures associated with the submission of a standard document such as a business plan or executive summary will be more likely to receive venture capital funding.

Inclusion of information in Business Plans

Business plans are voluntary disclosures of information about a company to interested parties. Given that the new venture is the source of information, and the new venture has strong motivations to present the opportunity in a positive light, an investor may be wise to view information in the plan skeptically. With this in mind, the creator of the business plan must make two decisions: The entrepreneur must first decide whether or not to include specific information in the plan and then, conditional on the inclusion of this information, whether or not to disclose the information truthfully.

Inclusion of information in a plan indicates that the author believes that this information is an important signal to a venture capitalist. A failure to include a potentially positive signal may indicate that either the entrepreneur believes that the information is irrelevant, or alternatively, the entrepreneur believes that disclosure of this information may decrease the probability of funding (c.f., Bull and Watson 2004). Bull and Watson examine evidence disclosure in a court of law in the context of contracts of bi-lateral or multi-lateral trade. They conclude that positive evidence is forthcoming and negative evidence is withheld, unless there is a punishment for withholding evidence that is sure to be discovered. If venture capitalists understand the strategic nature of information

disclosure, the inclusion of information will be seen as an important cognitive cue, just as the omission of a presumed cue may suggest that the founders have something to hide. Assuming that, say, biographical information is easily and accurately discovered in the diligence process, its omission from the planning artifact would likely result in negative categorization.⁵ We use this basic theoretical information in the formulation of specific hypotheses below.

H2b: Controlling for the submission of a standard business plan, ventures associated with business plans that are complete – in the sense that they conform to norms dictating which information should be included – are more likely to receive venture capital funding.

Previous Financing and Funding Request: Prior capital commitment indicates that another entity has positively evaluated a business. In effect, previous funding is an endorsement of a venture and conveys increased legitimacy to subsequent potential investors (Stuart *et al.*, 1999). Accordingly, we hypothesize:

H3a: Ventures associated with planning documents that include statements of prior non-VC outside private equity funding will be more likely to receive venture capital funding.

Due to strong information asymmetry, finance scholars have long recognized that internal financing is a costly signal that conveys quality to a potential stakeholder. An entrepreneur would not be willing to invest her own resources in a venture unless she believed the venture to have high potential. In effect, the entrepreneur is “putting her money where her mouth is” (Leland & Pyle 1977; Lazear, 1999). Therefore, internal investment is a potential positive cue:

⁵ Another possibility is that biographical information is irrelevant, in which case failure to include such information would be unrelated to funding outcome.

H3b: Ventures associated with planning documents that include statements of prior founding team funding will be more likely to receive venture capital funding.

Finally, the size of venture capital firms has grown over time (Gompers & Lerner, 2000). However, managerial expertise is not necessarily scalable. Hence, venture capitalists tend to finance in larger amounts than other non-venture private equity investors (Fenn *et al.*, 1995). A request for too little money will cue the venture capitalist that the opportunity is not of sufficient size to be of interest and / or the entrepreneurs are not particularly savvy. We hypothesize:

H3c: Ventures associated with planning documents and related communications that request greater amounts of financing will be more likely to receive venture capital funding.

Organizational and Team Structure.

Structural attributes of the entrepreneurial team are related to the performance of new ventures. In particular, large founding teams bring more social capital, provide more managerial resources, and enable greater role specialization (Sine *et al.*, 2006). In general, founding team size has been shown to be positively related to revenue growth in new ventures (Eisenhardt & Schoonhoven, 1990). Moreover, a person named in the planning document is indirectly endorsing the proposed venture (Sarasvathy, 2007); larger teams therefore signify stronger endorsements. Planning documents that do not refer to any specific individuals might reasonably suffer due to the omission effects

identified above. Conversely, reporting a large founding team may be a cue that increases the likelihood that a solicitation is categorized as attractive. More formally:

H4a: Ventures associated with business planning documents that reference management team information are more likely to receive funding.

H4b: Conditional on referencing management team information, ventures associated with business planning documents that reference more management team members are more likely to receive funding

Extending the pioneering work of Stinchcombe (1965), recent research has identified the importance of organizational structure in increasing the performance of new ventures in emerging industries (Burton *et al.*, 2002). Consistent with the idea of organizational completeness and the observed importance of top management team role formalization and specialization (Sine *et al.*, 2006), the articulation of greater organizational structure may serve as a cue that will facilitate positive categorization of the opportunity by potential funders.

H4c: Ventures associated with business plans showing evidence of increased management team role formalization, role specialization and greater organizational completeness are more likely to receive funding.

Human Capital:

The business plan showcases the characteristics and qualifications of the founders and management team. Recent evidence suggests a relationship between human capital and the ability to acquire resources (Colombo *et al.*, 2004, Almus & Nerlinger, 2003).

Moreover, folk wisdom in the new venture community supports the idea that VCs “invest in people as much as, if not more than, they invest in technology” (Grossman, 2006).

Thus, we expect that human capital characteristics of the founders and management team will serve as cues in the VC selection process.

Education, the most common measure of human capital, is positively associated with resource acquisition (Bates, 1997). Receiving an advanced degree signifies acquisition of human capital (Colombo *et al.*, 2004, Almus & Nerlinger, 2003, Becker 1962). This would, in turn, suggest that the inclusion of formal human capital information will be interpreted as a positive cue in the categorization of an associated opportunity.

Alternatively, it is not clear that formal education provides the specific human capital necessary to successfully start a business, in which case the inclusion of this information might be viewed as a negative cue by a potential VC funder. Nevertheless, we hypothesize in the affirmative.⁶

H5a: Ventures associated with business planning documents that refer to prior educational human capital attainment are more likely to receive venture capital funding.

Entrepreneurial experience.

Research on the phenomenon of serial entrepreneurship suggests that new venture creation is a complex skill that can be honed through practice. Specific attributes of work history such as related industry experience have been shown to be related to resource acquisition (Colombo *et al.*, 2004). Our conversations with venture capitalists suggest that entrepreneurial experience may also be a proxy for the existence of social

⁶ It may also seem interesting to consider whether the quality of this education might matter. However, as we shall see, in general, only a small share of business plans include educational experience. Hence, our data do not support testing of hypotheses about educational quality. In the interest of brevity, we do not develop formal hypotheses here. We refer the interested reader to Storey, (1994).

networks. Entrepreneurs with greater entrepreneurial experience may be better connected to venture capital networks. This suggests that prior entrepreneurial experience will serve as a positive cue for the prospective venture capitalist. Moreover, given our discussion above about the inclusion of information, a failure to report any entrepreneurial experience may be interpreted as a negative cue. Taken together, we hypothesize:

H5b: Ventures associated with business planning documents that refer to the prior *entrepreneurial* experience of founding team members are more likely to receive funding. Conditional on business planning documents containing a reference to the prior entrepreneurial experience of founding team members, ventures associated with business planning documents that report more prior entrepreneurial experience, are more likely to receive funding.

Non-entrepreneurial work history may be indicative of important skills necessary to manage a new business. Cooper *et al.* (1997) found that industry-specific experience contributed to both survival and growth, but they observed no significant relationship between general professional experience and either venture survival or growth. Again, we therefore expect prior professional experience to serve as a cue for venture capitalists. We hypothesize:

H5c: Ventures associated with business planning documents that refer to the prior *professional* experience of founding team members are more likely to receive funding. Conditional on reference to professional experience, ventures associated with planning documents that refer to greater prior professional experience of management team members are more likely to receive funding.

The implied endorsement of having worked at a high status firm may convey legitimacy to would-be investors (Stuart *et al.*, 1999). Moreover, Burton *et al.* (2002) argue that entrepreneurs may inherit entrepreneurially specific legitimacy if their former employer possesses a reputation for spawning higher quality startups than others. Hence, we

hypothesize that the source of professional experience may also be a cue for venture capitalists:

H5d: Conditional on a business planning document containing a reference to the prior professional experience of management team members, ventures associated with planning documents that reference prior experience at entrepreneurially prominent firms are more likely to receive funding. In addition, ventures associated with planning documents that reference prior experience at Fortune 1000 firms are more likely to receive funding.

3. Empirical Method

In our analysis below we explicitly test whether information in business plans predicts venture capital funding. Our dependent variable is dichotomous, implying a discrete choice analysis (Probit and Logit are common implementations). In our data only 5% of the plans in our sample were funded after solicitation. This presents a challenge as to test our hypotheses we need sufficient variation in the dependent variable.⁷ Insufficient variation will create a downward bias on estimated coefficients. To correct for this, we use a rare-events Logit model (King & Zeng, 2001).

To see why there is a bias, consider a hypothetical case where firms above a certain (observed) quality threshold received venture capital funding.⁸ The goal of the empirical analysis then would be to identify that threshold. Conditional on sample size, if the probability of observing firms on each side of the threshold were equal, and if the distance from this threshold were randomly distributed, then the data would provide a significant amount of information to estimate the threshold. Now imagine that the dataset

⁷ To see this, consider the case where none of the companies in the sample received venture capital funding. In such a case, the data would be completely unsuitable for our theoretical framework.

⁸ For a formal description of the econometric reasoning, see King & Zeng (2001).

was reduced in size by randomly eliminating observations. This exercise would, in general, reduce the number of observations above and below the threshold equally. In this case, while we would be able to estimate the threshold with less precision, the expected point estimate would remain unchanged. Now consider a case where the probability of observing a plan of sufficient quality were small, say 5%. Each high quality draw is particularly important in identifying the threshold. Moreover, each such draw is from the tail of the distribution which in turn teaches us about the extent of this tail. Since the likelihood of observing extreme observations is low, we will infer that the ones we do observe are the most extreme, and systematically underestimate the size of the tail. In a rare-events scenario, this tail is of interest: these “border” firms provide the bulk of information with which to estimate the threshold. In the extreme case, if there are very few firms with quality measures beyond the “border”, then the information with which to estimate the threshold becomes negligible. An uninformed regression will not take this into account and hence will tend to bias the estimate towards zero. An informed regression, however, will overweight the firms with positive values (i.e., the events). In this way, the high quality firms will more strongly influence the estimates – in essence magnifying the information of the rare events.

Ideally, we would use population-level information about the propensity of firms to receive venture capital funding. Unfortunately, the propensity of technology firms to receive venture capital funding is not known generally, and hence we are unable to correct for this problem (the rare events methodology that we use assumes that the sample is representative). However, following the logic behind the rare-events bias, we

can state with certainty that this problem will attenuate our estimates. In this regard, our hypothesis testing exercise is particularly conservative.

4. Data

To explore the relationship between the content of business plans and the observed outcome of the proposed venture, we exploit a sample of solicitations submitted to a single venture capitalist based in the Northeast from April 1999 to February 2002. The solicitations in the sample were submitted during the peak of the Dot Com bubble and its immediate aftermath. The venture capital firm that received the solicitations partnered with a major internet portal; over 89% of the solicitations proposed to create Dot Com firms (defined with reference to the taxonomy of internet business models proposed in Afuah & Tucci (2003)). The potential implications of sampling during this period are addressed more fully in the discussion below.

The sample consists of 1063 solicitations seeking first round venture capital funding for which the Focal Venture Capitalist maintained paper records. In our discussion, we consider an additional 93 firms seeking later round funding. These paper records include business plans, executive summaries, emails and memos, one page venture summary documents, private placement memoranda, press kits, press releases, related news articles, financial statements, and power point presentations.

684 of these solicitations subset contained at least a full business plan and/or an executive summary. (Some of these included other documents as well). An additional 54 included

only alternative forms of documents. For these solicitations, we coded data from any document that was submitted to the venture capitalist. 428 of these 738 solicitations contained management team information. These 428 solicitations describe 3,773 individuals, 2,763 in managerial roles, 660 served on board of directors and 602 on advisory boards (some served in multiple roles). 704 individuals are noted as founders. The median management team had 5.23 individuals, while the largest had 33. These managers had previous (reported) experience in 4,652 firms, and reported graduating from 711 universities/schools. In this sense there is much variation in the nature of information included in these documents.

As this is a convenience sample, we seek to understand whether there are any potential biases associated with it. Ideally, we would compare attributes of the studied population to attributes of a representative sample of the general population along observable dimensions. Unfortunately, we know of no representative sample of Dot Com firms. Instead, we exploit the fact that of the 1,063 firms soliciting first round funding, 58 were eventually successful. We then compare the attributes of these firm's funding rounds with those of the general population. This allows us to determine if and to what degree the funded companies from the studied population are different from the entire population of venture funded companies along several dimensions. We then assume that these differences and similarities also characterize the contrast between our studied sample of solicitations and the entire population of venture capital funding solicitations.⁹

⁹ Goldfarb *et al.* (2005) contains a detailed description of the sample and an evaluation of the extent to which it is representative of the overall population of solicitations submitted to American venture capital funds during this period. Because it is not possible to identify this larger population, they compared the firms in the sample that received venture capital funding with all financings reported in the VentureXpert

VentureXpert categorizes US-based venture capital deals that are entrepreneurial focused as “PWC” deals.¹⁰ In our benchmarking analysis, we include only PWC or angel deals. 16 of the firms that received funding do not meet this criterion, generally because they were either non US-based firms or alternatively, because they were funded by non US-based venture funds.¹¹ We report the results and details of this comparison in Appendix A. As in Goldfarb *et al.* (2005), the funded plans received less first round financing amounts than the general population, and appear to have been systematically valued at amounts less than the mean firm in the population. This suggests that we under-sample high-quality firms. This sample characteristic may lead to a general paucity of VC funding events.

Our sample spans the time before, during and after the Dot Com Era, where the Era is defined as the period between the Netscape IPO and the peak of the NASDAQ in March 2000. This poses two important problems. First, we are studying an era of early industry emergence. There was no tried and true “way to do business” on the internet during this period (See Goldfarb *et al.*, forthcoming). Second, our sample is internet specific. It is unknown to what extent our results generalize to business plans for mature industries or

database. On that basis, they concluded that the firms in the sample received less funding and were less California-centric than the typical firm in VentureXpert, but were otherwise similar.

¹⁰ PWC Money Tree deals include “cash-for-equity investments by the professional venture capital community in private emerging companies in the U.S. The survey excludes debt, buyouts, recapitalizations, secondary purchases, IPOs, investments in public companies such as PIPES (private investments in public entities), investments for which the proceeds are primarily intended for acquisition such as roll-ups, change of ownership, and other forms of private equity that do not involve cash such as services-in-kind and venture leasing. Investee companies must be domiciled in one of the 50 US states or DC even if substantial portions of their activities are outside the United States (see <http://www.pwcmoneytree.com/moneytree/nav.jsp?page=definitions>).” Because of our interest in angel financing, we also included all deals of individual investors and angels regardless of the deal’s PWC status. (Angels were either self-identified or listed as “individuals” in Venture Economics.) The results are insensitive to including all venture deals ignoring fund origin.

¹¹ The results of the comparison are qualitatively similar when we include the non-PWC deals.

to business plans in other emerging industries, such as, say biotechnology. This problem is mitigated somewhat as our sample also includes solicitations received during the post-bust era when the industry was (slightly) more mature.

Finally, as the Focal VC did not invest in any of the companies that we observe, the analysis implicitly assumes that the cues identified in the business planning documents submitted to the Focal VC were the same or substantially similar to those submitted to the eventual funders.

Dependent Variable

Acquisition of desired funding: Our unit of observation is the business associated with the solicitation.¹² We used archival methods to establish whether or not the venture succeeded in raising the funds sought in the solicitation. In particular, if we identified a funding round in the Thompson Financial Venture Economics (VentureXpert) database after the solicitation date and that round was classified as a PWC deal or readily identifiable as an angel deal, the dependent variable took the value of 1. Otherwise, it received the value of 0.

Independent Variables:

Social Ties: The Focal VC tracked the source of the solicitations it received. This action in itself indicates the importance of social networks in venture capital decision making. 277 of the solicitations were unsolicited. The social network of founders associated with

¹² We are careful not to use the language “firm” as some of the solicitations we observe never resulted in the creation of a firm.

referred solicitations, by definition, included venture capitalists. Strictly speaking, we can only conclude that the social networks of entrepreneurs associated with unsolicited requests did not include the Focal VC. However, it is likely that these social networks did not include venture capitalists in general. Therefore, the source of the solicitation is the relevant cue to the venture capitalist. As we elaborate in the results section, none of the unsolicited funding requests *ever* received venture capital funding. Hence, these observations were dropped from the analysis (including all subsequent tabulations reported in the text).

Structure of Solicitation: We observe significant variance in the types of documents included in remaining 786 solicitations. We observe a full business plan or executive summary artifact for 494 of these solicitations. There are an additional 234 solicitations in which we observe other types of documents (such as press kits, private placement memoranda etc) but do not observe a full business plan or an executive summary. 2 of these received venture capital funding. Beyond the nature of the document solicited and the revenue model coding (see below) further information was not coded for these observations. There were an additional 58 solicitations that included no company-generated documents. Records of these solicitations were generally one-page handwritten forms completed by the Focal VC summarizing the basic elements of the business. Table 1 reports the count values of different types of submitted documents associated with the 728 solicitations that included documents, along with the eventual funding success rates. The average solicitation included 1.97 documents (s.d., 1.0) though some contained up to 7 documents. We observe 197 business plans and 340 executive

summaries. If a business plan also included an executive summary with in the same artifact, then this executive summary was not counted separately. 493 of the observations are accompanied by some sort of introductory communication. 33 solicitations included a press kit or newspaper article. We also observe 68 solicitations accompanied by documents best described as company profiles, 140 documents entitled “background information”, 36 solicitations with financial information under separate cover, 44 private placement memoranda, 39 PowerPoint presentations, 29 product descriptions, and 42 screenshots. It would appear from the table that solicitations with public relations materials, investment information and product information were eventually more successful than others. We test the robustness of these results in the regression analysis below. However, observed variance clearly suggests that many entrepreneurs either believe that strict conformity to a solicitation protocol is counter-productive or such a protocol does not exist. Table 1 also describes the names of the dummy variables later used in the regression analysis.

Plan completeness: To measure structural conformity we identified whether any of the following eight elements (or their equivalents) were in the plan: a description of the Product/Process, a description of the Target Market/Industry Analysis, the Value Proposition (i.e., why the product or process was a solution to a problem in the target market), the firm’s Competitive Advantage, the Business Stage, a description of the Team, the Marketing Plan, Financials and the revenue model. These are the sections commonly referred to in entrepreneurship textbooks (cf., Timmons & Spinelli, 2007, p. 229 or Baron & Shane, 2005, p. 169). PLAN COMPLETENESS is the number of these

sections identifiable in the plan. In coding this information, we used only business plans or executive summaries because our goal was to measure conformity to document conventions rather than the existence of the underlying information in the solicitation. The mean number of sections identifiable in the plans was 4.7. A standard deviation of 3.6 indicates significant variation in this variable.¹³

Human capital: We collected basic information about every person listed as a member of the management team, board of directors, or advisory board. For each person we directly coded information contained in the business plan: name, title and other attributes such as educational and professional background and prior entrepreneurial experience. Where information was not reported in the plan, we made basic inferences based on the information that was included. For instance, if an individual claimed to have an advanced degree, but there is no mention of a bachelor's degree, we assume that a bachelor's degree was earned as a prerequisite.

Although our unit of analysis is the solicitation, much of our information pertains to individual team members. To aggregate information about team members we took either team means, maximums, or alternatively, we used dummy variables that took the value of

¹³ We also experimented with a measure of quality of the presentation, the clarity and precision of communication and the style of presentation were evaluated. We note that these assessments are inherently subjective. Keeping with the purpose of the document, if the coder was able to understand what the Product/Process was, what the Target Market and targeted industry were, what the value proposition was, the firm's described competitive advantage, business stage, team composition, marketing plan and financials, then the plan received a high score. The coders were not asked to evaluate the quality of the ideas, rather whether they understood what they were. Quality was measured on a scale of 1 to 5, with 5 being highest. To control for differences in scaling among coders, scores were normalized by coder. We emphasize, we explicitly did not ask coders to rate the strategic viability of the plan. We found no relationship between this variable and the dependent variable, nor did it affect any of the other regressors.

1 if any of the team members had a particular attribute. For example, as described below, we used the mean number of prior companies in team member's work experience, and used a dummy variable to indicate whether *any* of the members reported receiving an MBA degree. These aggregation decisions are arbitrary and hence we explore the robustness of our results to different aggregation assumptions in the Results section.

Educational Human Capital: We code whether educational attainment was reported and if so, the degrees attained. Educational attainment was not generally disclosed in the documents. Only 18% of the solicitations report any BA experience of team members. Similarly, only 18% report any MBA and 16% report advanced technological degrees (D_BACH_DEGREE, D_MBA, D_MASTERS_TECH, respectively, Table 2).¹⁴

Absolute size. We record the total number of named executives listed in the business planning documents. We exclude individuals associated solely with the board of directors or other advisory roles. For regressions referring to the founding team alone, we

¹⁴ We investigated whether there were any systematic differences in venture outcomes as a function of status or ranking for those that reported such information. The relative status of the granting institution was determined from the US News & World Report yearly university rankings. We used the 1999 US News & World Report University rankings for several reasons. First, The US New & World Report ranks undergraduate, graduate, MBA, engineering, and liberal art schools. Other rankings (i.e., Business Week and the Financial Times) are restricted to only MBA programs. Second, the US News and world report has a yearly ranking survey, and was conducted during the time the data business plans were submitted to the focal VC. Additionally the survey ranks schools in both individual and tier fashions. Some individuals reported graduating from non-ranked programs. When this occurred, we assigned these individuals to a ranking one below the lowest US News & World Report ranking. For example, US News & World Report ranks the top 50 MBA programs. Each US News & World Report ranked MBA program received a ranking (50 as best, and 1 as worst), while each unranked program received a ranking of 0. (Parsimony dictated this approach even though it implies assigning cardinal values to an ordinal ranking.) In our analysis we use the mean ranking of team members MBA program status. We did the same for all degrees types: national undergrad and liberal arts institutions, MBA, and, engineering. Following Sorenson et al., we also explore the entrepreneurial prominence of the institution. Prominence is defined as the number of times a certain program was represented in our sample. We tested prominence both separately per type of degree and per school, i.e. regardless of the degree type. One concern is that a school might be prominent simply because it is large. Hence, we adjusted the prominence scores by size-based measures, where available. Our empirical analysis failed to reveal any measurable patterns.

record the reported number of individuals identified by the planning document as founders. The variable TEAM SIZE is skewed, hence, in the regressions we use the natural log of management team (LN(Team Size)). As opposed to arbitrary scaling, to avoid taking the natural log of 0, we set $\ln(0)$ to 0 and included a dummy variable, NO TEAM REPORTED, that took the value 1 to distinguish between $\ln(0)$ and $\ln(1)$.

Entrepreneurial experience: From the summary biographies we extract work histories, former entrepreneurial experience, and entrepreneurial prominence of former employers. According to the statements in the planning documents, we recorded which of the managers' former employers were startups. NB OF PRIOR STARTUPS was calculated as the total number of past claimed startup experiences. Of those solicitations that included team information, 35% failed to report any startup experience (D_NO STARTUP EXPERIENCE). Conditional on reporting, the mean number of prior entrepreneurial companies averaged over all management team members per solicitation was 0.6 (NB OF PRIOR STARTUPS).

Professional Experience: We coded the total reported number of companies at which management team members worked prior to the venture described in the solicitation. If the plan did not indicate prior company experience, we assumed it zero. Of those solicitations that included team information, only 18% failed to report any prior company experience (D_PRIOR_COS). The average number of prior companies reported by management team members in each solicitation was 1.85 (NB PRIOR COS). That is,

management team members generally had 3 times more corporate experience than startup experience.

Entrepreneurial prominence: Following Burton *et al.* (2002), who argue that firms that possess high entrepreneurial prominence are also more likely to generate startups, ENTREPRENEURIAL PROMINENCE is measured as the relative frequency that a former employer appears in the dataset. The mean entrepreneurial prominence averaged over management team members was 5.26. That is, the mean management team reportedly held jobs from companies at which 5-6 other management team members in the *dataset* had worked.

Fortune 1000: We checked if the managers' professional background included any Fortune 1000 firms. We used the 1999 Fortune 1000 list for reference. Since multiple experiences for each team member were sometimes listed, we took the maximum ranking of any prior management team member's job, and then averaged that maximum across team members. For the variable FORTUNE RANK, the top ranking firm is associated with a value of 1001, and the lowest with rank 1. Firms that were not in the Fortune 1000 received a rank of 0. The mean ranking was 673.

Team completeness and specialization: Following Sine *et al.* (2006), we measure team completeness (TEAM COMPLETENESS) as the number of the following managerial roles reported in the planning documents (out of 17): Chairman, Chief Executive Officer, Business Administration, Chief Financial Officer, Marketing, Corporate Development,

Chief Engineering Officer, Human Resources, International sales, Manufacturing, Management and information systems, Purchasing, Quality control, Research & development, Sales, Strategic planning, Technology transfer, Nonisomorphic role or Insufficient information provided for classification¹⁵. A higher score reflects higher team completeness. Conditional on reporting team information, the mean score in the sample was 3.22. Our measure of team specialization, TEAM SPECIALIZATION, is measured as the number of management team members divided by the number of roles filled. A low number indicates less specialization. For example, a score below one indicates that a single individual is filling multiple roles. The results indicate a substantial degree of role duplication (mean = 1.39).

Commitment of resources. Many of the solicitations came from companies that had already received financial support of one kind or another. When reported, we document the number of non-venture capital rounds identified in the plans (ANGEL ROUNDS). The mean reported number of private equity rounds was 0.21. We are unable to identify the source of these rounds (i.e., either founder rounds or outside private equity) from all solicitations. For those that we can identify, 64% of these firms had rounds that came from founders. The dummy variable D_FOUNDER_INVESTED takes the value 1 if the planning documents report that any insider invested in the plan and 0 otherwise.

Control variables

¹⁵ Nonisomorphic role and Insufficient information are not counted in the denominator.

Proposed revenue model. Due to high uncertainty in the context of the emerging internet marketplace, we coded the revenue model of each solicitation using a taxonomy developed by Afuah & Tucci (2003). In addition to demarcating the boundaries of the emerging industry, the revenue model describes how the founding team proposed to exploit the purported opportunity. The revenue model coding also tracks how many different revenue models a given firm chooses to exploit. We describe the revenue models and their relative incidence in Table 3.

Firm Age & Timing of Solicitation. We measure the timing of the observed solicitation. If the solicitation occurred before or during March of 2000, the variable D_PRE_BUST took the value 1. If the solicitation occurred after March of 2000, the variable D_PRE_BUST took the value 0. 47% of the firms solicited funding before March 2000.¹⁶

Financial projections and amount requested. Venture capitalists often manage large funds, which in turn dictates that investments need be of sufficient size to be a worthwhile allocation of a VCs time (Gompers *et al.*, 2006). The amount requested, AMOUNT REQUESTED, was extracted either from the planning documents or from communications between the Focal VC and the soliciting firm. 40% of firms did not request a specific amount of money. The dummy variable D_NO_AMOUNT_REQUESTED took the value 1 if the planning document contained no specific request and 0 otherwise. Conditional on the presence of an amount, the average request was for \$3.47M.

¹⁶ We also tried controlling for firm vintage. The reported founding dates are highly correlated with the date of solicitation, so we are unable to simultaneously control for each. We report results using the solicitation measure, but our results are robust to this decision.

5. Results

None of the opportunities associated with the 277 unsolicited requests ever received venture capital funding. The data, therefore, strongly suggest that the cues contained in the business planning documents were ignored by the venture capitalists unless they had a personal connection to the artifacts' source. Therefore, we find strong support for Hypothesis 1. As mentioned in the Data section, we condition the remainder of the analysis on the solicitation arriving through a referral and drop these 277 firms from the analysis, leaving 786 firms in the sample.

Only 34 of the 728 firms (4.7%) that submitted any planning document eventually received funding.¹⁷ Moreover, only 19 of the 428 firms (4.0%) that include management team information in their solicitations eventually received funding. From a methodological perspective, this small number of events suggests that the rare-events logit methodology is appropriate.

We report pair-wise correlations in Tables 4. We report our central regression results in Tables 5 and 6.¹⁸ In Model 1 we test Hypothesis 2a. The regression model controls for revenue models (described in Table 3) and also includes the controls `D_PRE_BUST`,

¹⁷ We count only those that received "typical" US-based venture capital funds (or funds from individuals or self-identified angels that were reported in the Venture Economics database; see footnote 10). While our results are robust to the inclusion of atypical rounds (i.e., rounds associated with non-US based firms or VCs, roll-ups and leveraged buy-out deals), selection criteria for these types of VCs, firms and deals are likely to be substantially different than more typical deals. Hence, we excluded them to increase the level of homogeneity in the sample.

¹⁸ The above described rare-events logit is implemented using the `relogit` routine in Stata 8. We also estimated the models using a standard logit framework and the results are weaker – as predicted by the econometric theory.

ANGEL ROUNDS, D_NO AMOUNT REQUESTED, and, AMOUNT REQUESTED.

The dummy variables representing the types of documents included in the solicitation are not mutually exclusive; hence the reference group is the solicitation that includes no documents. We find that having a press kit or a private placement memorandum in the solicitation is positively associated with venture capital funding, and inclusion of a business plan is not significant at conventional levels

($\beta_{D_BUSINESS\ PLAN} = .64; p > |z| = .16$).¹⁹ We find no evidence that including an executive summary is associated with successful venture capital outcomes. Thus, we interpret these models interpret as a lack of support for Hypothesis 2a: submission of a “standard” business plan document does not appear helpful, although the submission of less standard documents such as press kits does. In Model 2 we repeat the regression without control variables. We find a similar result with regard to private placement memoranda, but none of the other results appear without the controls. However, a Wald test reveals that the series of document type dummy variables are jointly significant

($\chi^2(11) = 24.09; p > \chi^2 = 0.01$).

In Model 3 we include PLAN COMPLETENESS so as to test Hypothesis 2b.

Conformity, as proxied by PLAN COMPLETENESS, does not predict successful funding

($\beta_{PLAN\ COMPLETENESS} = -1.15; p > |z| = .12$). In Model 4, when we exclude revenue models dummies and financial information controls, we find a *negative* and marginally significant result: $\beta_{PLAN\ COMPLETENESS} = -0.15; p > |z| = .07$.²⁰ In both Models 3 and 4. we

¹⁹ A private placement memorandum often contains a business plan.

²⁰ One might be concerned that our business plan result is related to the amount of information as proxied by the number of pages. In unreported regressions, we a) found no relationship between the length of the

find that after controlling for conformity, inclusion of a full business plan strongly predicts venture capital funding. In Model 3, for example, we find

$\beta_{D_BUSINESS\ PLAN} = 1.30; p > |z| = .02$. This effect is large: the mean predicted probability of venture capital receipt in the sample population rises from 0.04 to 0.07 for solicitations that include a business plan as compared to those that do not. However, the 95% confidence interval is 0.01 to 0.17, i.e., our measurement is imprecise. Thus, we conclude that there is support for Hypothesis 2a – submitting a full business plan is helpful – but only if it is abbreviated.²¹

In Models 1, 3 and 5 we test Hypotheses 3a, 3b and 3c. (In Models 1 and 3, we include solicitation characteristics). We find no evidence that prior equity funding is related to venture capital funding. The coefficients on ANGEL ROUNDS are not statistically distinguishable from zero in any of the three regressions. In Model 5 we also include a dummy (D_FOUNDER INVESTED) and remove controls. The coefficient on this variable is also statistically indistinguishable from zero. To eliminate the possibility that this negative result is driven by multi-collinearity between D_FOUNDER INVESTED and ANGEL ROUNDS, we conducted a Wald test. We fail to reject the hypothesis that both coefficients are jointly zero ($\chi^2(2) = .28; p > \chi^2 = .87$). Hence, we find no support for Hypotheses 3a and 3b. We do find weak support for Hypothesis 3c: In Models 1 and 3 the coefficient on AMOUNT REQUESTED is positive and significant at the 10% level.

documents (in pages) and funding outcomes, b) no relationship when pages was interacted with plan completeness or type of document along the business plan-executive summary dimension.

²¹ In Models 6,7, 9, 11, 13, and 15 which include only observations for which we observe full team characteristics, the business plan effect goes away (that is, inclusion of a full business plan is not related to successful outcomes). Thus, it appears that the submission of the full business plan is only important as compared to submission of documents that do not contain much biographical information.

However, the result is not robust to the removal of controls, as evidenced in Model 5. A failure to articulate a specific funding request amount is not related to eventual funding success, (i.e., the coefficient on D_NO AMOUNT REQUESTED is statistically indistinguishable from zero in all three models).

To test Hypothesis 4a, we note that of the 485 solicitations in our reduced sample that included business planning documents, 57 failed to report team information. Only two of these 57 (3.5%) eventually received funding. Similarly, 17 of the 428 (4.0%) that included team information were successful. However, this implies that there is little information in the data to test this particular hypothesis. We were unable to implement a rare-events logit that included the dummy variable D_NO TEAM REPORTED. Instead, we ran linear probability, Probit and Logit models and also ran a rare-events logit specification that used the full sample that included solicitations that did not have business planning documents (which clearly also did not report team information). In none of these specifications did we find a statistically significant relationship between the inclusion of team information and successful funding outcomes. We report the results of the logit model in Table 5 (Model 6). In this specification the coefficient on D_NO TEAM REPORTED is positive, but not significant at conventional levels. More generally, in this model we cannot reject the null hypothesis that all coefficients are simultaneously zero ($\chi^2(15) = 11.97; p > \chi^2 = .7$). While this is an extreme test, as it does not account for the known attenuation bias associated with the rare-events characteristic of the data, we conservatively conclude that there is little evidence to support Hypothesis 4a.

Hypothesis 4b is tested in Model 6 as well. In this specification, we find that the natural log of team size (LN(TEAMSIZE)) is positive and significant at the 10% level.²² As we explore below, this result strengthens when we control for additional team characteristics and use the rare-events methodology.

To test Hypothesis 4c, in Model 7 we include TEAM COMPLETENESS, TEAM SPECIALIZATION and a dummy that indicates whether information about the either the board of directors or advisory board is included (D_BOD). LN(TEAMSIZE) and TEAM COMPLETENESS are highly correlated (see Table 4), hence both coefficients tend towards zero when included simultaneously. Therefore, LN(TEAMSIZE) is excluded from this regression. The results do not reveal any significant patterns in the data. Moreover, a Wald test that all variables in the regression are jointly zero cannot be rejected ($\chi^2(15) = 19.13; p > \chi^2 = .2$). Thus, we find no support for Hypothesis 4c.

In Table 6, Model 8 we test the four human capital hypotheses (H5a, H5b, H5c and H5d). First, we reject the null hypothesis that all the coefficients in the regression are jointly zero ($\chi^2(10) = 28.10; p > \chi^2 = .001$). While we report the regression results without additional regressors, with the exception of ENTREPRENEURIAL PROMINENCE, the results in this regression are robust to the inclusion of document type dummies, AMOUNT REQUESTED and the D_PRE_BUST.

²² We report the natural log of team size as opposed to the absolute number as this variable has a long right tail. The results reported are the *strongest* we found in the data. Including a team size variable without taking the natural log is not significant. Second, we also experimented with a quadratic form – and failed to find a relationship.

Entrepreneurs do not consider educational human capital, as proxied by educational attainment, to be of interest to venture capitalists.²³ In particular, we find no evidence in support of Hypothesis 5a (see coefficients for D_BACH_DEGREE, D_MASTERS_TECH, D_MBA). The failure to reject the hypotheses for individual coefficients is not related to multi-collinearity. The Wald test for the null hypothesis that all three coefficients are jointly zero cannot be rejected at any significance level ($\chi^2(3) = .29; p > \chi^2 = .96$).

We find no support for the first part of Hypothesis 5b (reporting of entrepreneurial experience). $\beta_{\text{NO STARTUP EXPERIENCE}} = .48; p > |z| = .53$. However, we do find weak support for the second part of Hypothesis 5b ($\beta_{\text{NB PRIOR STARTUPS}} = .35; p > |z| = .09$). If the reported number of prior entrepreneurial companies averaged across management team members is one more than the mean of 0.33, the sample predicted probability increases by 0.015 (95% confidence interval = [-.00,.04]), which is an increase of 37%.

Conditional on reporting prior experience, we find no support for Hypothesis 5c ($\beta_{\text{NB PRIOR COS}} = -.18; p > |z| = .4$). However, not only do we fail to find support for Hypothesis 5c, we find the opposite. The dummy variable D_PRIOR_COS is negatively and significantly related to venture capital funding outcomes

($\beta_{\text{COMPANY INFO REPORTED}} = -3.23; p > |z| = .03$). While this measured effect is very large, it

²³ We note that this may be a sample-driven result. It is likely that this is of greater importance in science-driven fields such as biotechnology. Indeed, there is substantial evidence in the literature that affiliation of intellectually prominent advisory board members and technical management team members is related to IPO valuations {cf., Stephan and Everhart 1998}

is also imprecise. The baseline predicted probability of funding is .04 (95% confidence interval = [.02 to .07]). The decrease in the sample mean predicted probability of funding for a solicitation that includes team information as compared to one that does not is 0.34 (95% confidence interval = [.83,.01]).

We find weak support for Hypothesis 5d ($\beta_{\text{ENTREPRENEURIAL PROMINENCE}} = .06; p > |z| = .09$).

This effect is small – the change in the mean predicted probability of funding for the sample after a one unit increase in this measure is 0.002 (95% confidence interval = [-.000 to .004]), which is a 5% increase. Moreover, FORTUNE RANK is also marginally significant ($\beta_{\text{FORTUNE RANKING}} = .003; p > |z| = .06$). If the prior company ranking (averaged across team members) increases from 250 to 750, then the mean sample predicted probability of funding increases by 0.04 (95% confidence interval = [-.00, .06]). That is, the probability of funding almost doubles.

Finally, we also note that after including these human capital variables, we find strong support for the importance of team size on the likelihood of venture capital funding (H4b). In particular, Model 8 predicts an increase in reported team size from 4 to 5 increases the mean predicted probability of venture capital funding by .004 (95% confidence interval [.00,.01], which is a 10% increase. This result is robust to using a linear measure of team size as opposed to the natural log, although in this latter case the coefficient is only significant at the 10% level.

In Model 9 we explore the robustness of these results to the inclusion of solicitation characteristics. The results remain qualitatively unchanged.

Robustness checks: We made two assumptions in our analysis that are somewhat arbitrary. First, we used characteristics of the full management team, as opposed to the founding team. It is conceivable that venture capitalists are most concerned with the founding team alone. Second, we used averaged human capital measures across team members. It is plausible that the maximum values are more important. To investigate the robustness of our results to these assumptions, we repeat Models 8 and 9 using: maximum values for top management team members (Models 10 and 11), mean values for founders (Models 12 and 13) and maximum values for founders (Models 14 and 15).

In contrast to Models 8 and 9, in Models 10 and 11 we find that if one member of the management team hails from an entrepreneurial prominent firm, the likelihood of funding increases. In Model 10, LN(TEAMSIZE) is significant at the 10% levels, but it is significant at the 5% level in Model 11. D_PRIOR_COS is no longer significant. We note that we are unable to estimate a model that simultaneously includes both ENTREPRENEURIAL PROMINENCE and FORTUNE RANK for these specifications.

In Models 12 and 13 we find that the NB OF PRIOR STARTUPS of the founding team significantly predicts venture capital funding; a result that only obtains weakly for the full management team. However, we are only able to estimate these models including a small number of controls. Finally, in Models 14 and 15 we find that maximum levels of human

capital variables are not predictors of venture funding outcomes. An astute reader will notice that the educational attainment dummies are omitted from the latter four models. This is because reporting MBA experience of any founding team member completely determines a (negative) funding outcome and none of the other two educational human capital variables are significant nor do they affect any of the other coefficients.

To summarize: first, businesses associated with submissions that arrive unsolicited do not receive funding. Second, businesses associated with submissions that include full business plans are positively associated with venture capital funding. Submissions that include investment documents such as private placement memoranda and press materials are more likely to receive funding. Third, venture capitalists prefer businesses associated with planning documents that describe larger teams. Fourth, venture capitalists also prefer businesses associated with planning documents that describe entrepreneurs who have started companies before, but are less concerned with the startup experience of other management team members. Venture capitalists prefer entrepreneurs that come from entrepreneurially prominent firms and perhaps those ventures with management team members with experience in Fortune 1000 companies. Fifth, there is no evidence that businesses associated with plans that report educational human capital, angel- or self-funded rounds are more likely to receive funding. Finally, we also find that venture capitalists are unlikely to invest in firms requesting small amounts of money.

6. Discussion

We find that information in business planning solicitations and artifacts predicts funding. However, there are four important limitations to our theory and its implementation. First, our theory is incomplete: additional cues almost certainly exist.

Second, decision-relevant cues may be acquired through alternate channels. To illustrate this concern, we estimated a model that predicted financing success for firms that had received at least one round of venture investment prior to their solicitation of the Focal VC. In this unreported regression, we distinguished between venture capital funding amounts that were reported in the planning documents and those that were reported exclusively in public databases. Not surprisingly, both measures of previous funding are positive, significant and large. However, the coefficients of these variables are statistically (and numerically almost) identical. This finding suggests that information about previous funding is collected and processed by venture capitalists independent of whether the entrepreneurs choose to include it in a planning document. Whether this pattern holds true for the other variables of interest is unknown. If the prior funding result generalized to other independent variables, it would suggest that the business planning artifacts are not important sources of information for venture decision-makers. Given that these artifacts are so commonly associated with requests for funding, such a result would suggest that the submission of planning documents is a symbolic act and be inconsistent with the view that documents' contents are important for decision making.

Third, and importantly from the viewpoint of theory completeness, these alternate channels may be mediators who / that affect the information's interpretation. For

example, information may be interpreted differently when received from a trusted source. This would be problematic if some information systematically came from such channels. Finally, in the extreme case, our hypothesized cues may be correlated with unobservable, decision-relevant characteristics of the business opportunities.

At the very least, even if venture capitalists ignore all information in planning documents, and this information is correlated with other unobservables, our results indicate that planning documents include information that is predictive of venture outcomes. However, we are likely understating the value of this information due to the retrospective nature of the sample. Information about the proposed business idea is most likely important to venture decision-makers. Unhappily, today, in 2006, it is not possible to reliably evaluate the quality of business planning materials of pre-Dot Com Bust companies – as any such evaluation would be colored by the events of the last several years. An alternative research design would examine proposals as they arrived for a sample of venture capitalists. For every proposal that was eventually funded, a matched proposal that was rejected would be chosen. At that point, either an internal evaluation of the proposals would be collected or alternatively, the proposal would be rated by an unbiased panel. A central problem with this proposed design is that very few solicitations are actually funded. Hence, the study would require the recruitment of a fair number of participants. While we do not believe this to be impossible, we do believe it would be challenging.

7. Conclusion

We have examined whether objective information contained in business plans predicts funding outcomes. The study advances the literature by explaining venture capital decisions based on a large sample of business planning documents and associated solicitations. Our results suggest that while business planning artifacts may be helpful to venture capitalists, very few businesses that seek venture capital ever receive it. Second, we find that social ties are critical in venture capital fundraising. Without them, entrepreneurs will be very unlikely to succeed in raising capital.

We also find that solicitations that include business plans, private placement memoranda and press documents are more likely to receive funding. Moreover, we find that particular signals of human capital cue venture investors: larger teams, founders with greater entrepreneurial experience, founders with experience at entrepreneurial prominent firms, and management team members hailing from higher ranked Fortune 1000 firms are all associated with opportunities that are more likely to receive venture capital funding. Other potential cues, such as previous private equity funding or self funded rounds and educational human capital, are not.

Finally, while our study advances our understanding of the role of business plans, it also underscores the need for further research. We have articulated the study's shortcomings and have suggested ways in which to evaluate the primary question we seek to answer: What can we learn from Business Plans? We hope that our research will lead to further investigation of the relationship that that has been assumed to exist between the production of a business plan and the successful acquisition of outside funding.

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Table 1: Solicitation Characteristics

	Total Solicitations	Successful Solicitations	Successful %	Dummy Variable
Business Plan	197	14	7.10%	D_BUSINESS PLAN
Executive Summary	340	11	3.23%	D_EXECUTIVE SUMMARY
Intro Communication	493	18	3.65%	D_MEMO OR EMAIL
Public Relations Material	33	4	12.12%	D_PR MATERIAL
Company Profile	68	3	4.41%	D_COMPANY PROFILE
Background Information	140	10	7.14%	D_BACKGROUND INFO
Financial Information	36	1	2.78%	D_FINANCIAL INFO
Investment Information	44	5	11.36%	D_INVESTMENT INFO
PowerPoint Presentation	39	2	5.13%	D_POWERPOINT
Product Information	29	3	10.34%	D_PRODUCT INFO
Screenshot	42	3	7.14%	D_SCREENSHOT

Note: Solicited requests only. Requests generally included more than one document; The totals list documents submitted as separate artifacts. In general, most business plans include executive summaries. On occasion, executive summaries are submitted separately.

(mean = 1.07, s.d. 1.0, min 0, max 7)

Table 2: Descriptive Statistics

General	Obs	Mean	Std. Dev.	Min	Max
D_PRE_BUST	786	0.482	0.500	0	1
D_PLANNING DOCUMENT	786	0.617	0.486	0	1
D_NO_AMOUNT_REQUESTED	786	0.403	0.491	0	1
AMOUNT REQUESTED	786	3.466	6.318	0	60
PLAN COMPLETENESS	728	4.716	3.624	0	9
D_NO TEAM REPORTED	728	0.412	0.493	0	1
ANGEL ROUNDS	786	0.209	0.502	0	5
D_FOUNDER_INVESTED	428	0.638	0.481	0	1
Full Management Teams (mean of means)	Obs	Mean	Std. Dev.	Min	Max
LN(Team Size)	428	1.214	0.696	0	3.43
D_BACH_DEGREE	428	0.175	0.381	0	1
D_MASTERS_TECH	428	0.161	0.368	0	1
D_MBA	428	0.180	0.385	0	1
D_NO STARTUP EXPERIENCE	428	0.353	0.478	0	1
NB OF PRIOR STARTUPS	428	0.603	0.810	0	6
D_PRIOR_COS	428	0.818	0.386	0	1
NB PRIOR COS	428	1.849	1.438	0	8
FORTUNE RANK	428	673.334	393.259	0	1001
ENTREPRENEURIAL PROMINENCE	428	5.262	6.523	0	45.75
TEAM COMPLETENESS	428	3.215	2.161	0	11
TEAM SPECIALIZATION	382	1.394	1.013	0.4	9
Full Management Teams (mean of maximums)	Obs	Mean	Std. Dev.	Min	Max
NB STARTUP EXPERIENCE	428	0.988	1.579	0	20
NB PRIOR COS	428	2.981	2.217	0	9
ENTREPRENEURIAL PROMINENCE	428	14.072	19.363	0	73
Founding Team (mean of means)	Obs	Mean	Std. Dev.	Min	Max
TEAM SIZE	485	0.990	1.145	0	7
D_BACH_DEGREE	485	0.159	0.366	0	1
D_MASTERS_TECH	485	0.076	0.266	0	1
D_MBA	485	0.054	0.225	0	1
D_NO STARTUP EXPERIENCE	485	0.645	0.479	0	1
NB OF PRIOR STARTUPS	485	0.392	0.992	0	14
D_PRIOR_COS	485	0.441	0.497	0	1
NB PRIOR COS	485	1.045	1.484	0	8
FORTUNE RANK	485	394.112	474.092	0	1001
ENTREPRENEURIAL PROMINENCE	485	2.846	6.963	0	73
Founding Team (mean of maximums)	Obs	Mean	Std. Dev.	Min	Max
NB STARTUP EXPERIENCE	485	0.489	1.383	0	20
NB PRIOR COS	485	1.262	1.795	0	9
FORTUNE RANK	485	563.450	497.038	0	1001
ENTREPRENEURIAL PROMINENCE	485	4.361	11.297	0	73

Table 3: Revenue Models

Revenue Model	Explanations:	Examples*	Means**
Commission-based	A fee that is imposed on a transaction by a third party (usually an intermediary)	Inst-cash International Unibarter.com	0.22
Fee-for-Service	Pay as you go option, charged for professional service as you use it.	Metalogics, Inc. Flash Gordon	0.50
Advertising	Business of attracting public attention to a good or service, achieved through banner ads, pop ups, permanent buttons, etc.	RealTraveling.com Fidget	0.36
Subscription	Company charges a flat rate to use a service for a certain period of time.	Tendersys.com Homesmart.com	0.22
Referral	Fees for steering customers to another company, can either be a flat fee or a fee per click-through.	E-sitting Insureconnection	0.11
Production	Manufacturer sells directly over the Internet, cuts out middleman.	Games Interactive 100x.com	0.21
Mark-up Based	The Middleman, business not in production but in resale.	RealLegends.com Smartenergy	0.18
Other	Either not enough information to classify, or the revenue model was outside the scheme of an Internet Business.	Avatar Project	1.20

* Given examples are not part of the current study

** Means are based on current sample of 786 observations

Table 4: Correlations

Variable	a	b	c	d	e	f	g	h	i	j	k	l	m
a POST SOLICITATION VC FUND	1												
b PLAN		1											
c AMOUNT REQUESTED			1										
d D_BUSINESS PLAN			0.08	1									
e D_EXECUTIVE SUMMARY			-0.09*	-0.83*	1								
f D_MEMO OR EMAIL	-0.22*					1							
g D_PR MATERIAL					0.10		1						
h D_COMPANY PROFILE	-0.10*					0.09		1					
i D_BACKGROUND INFO	-0.18*			0.08			0.11*		1				
j D_FINANCIAL INFO	-0.09*			0.11*	-0.11*		0.08			1			
k D_INVESTMENT INFO				0.12*		0.12*			0.13*		1		
l D_POWERPOINT				0.13*	-0.10*		0.11*	0.13*			0.12*	1	
m D_PRODUCT INFO			-0.08	0.09*				0.10*				0.19*	1
n LN(TEAMSIZE)	-0.14*			0.24*	-0.19*				0.13*			0.08	0.09
o D_BACH_DEGREE				0.19*	-0.22*								
p D_MASTERS_TECH				0.18*	-0.17*			0.14*					0.09*
q D_MBA	0.09*			0.25*	-0.20*						0.11*	0.08	
r D_NO STARTUP EXPERIENCE				-0.31*	0.24*					-0.10*	-0.09*		
s NB OF PRIOR STARTUPS				0.23*	-0.11*						0.09		
t D_PRIOR COS				0.16*	-0.13*						0.08		
u NB PRIOR COS				0.20*	-0.15*		-0.11*	0.08			0.09		
v FORTUNE RANK				0.29*	-0.24*					0.11*			0.09
w ENTREPRENEURIAL PROMINENCE				0.10*			-0.08		0.09		0.13*		

Pairwise correlations reported.

Coefficient omitted if not significant at the 10% level.

* significant at the 5% level.

Table 4: Correlations (Continued)

Variable	m	n	o	p	q	r	s	t	u	v	w
m D_PRODUCT INFO	1										
n LN(TEAMSIZE)	0.09	1									
o D_BACH_DEGREE			1								
p D_MASTERS_TECH	0.09*	0.25*	0.20*	1							
q D_MBA		0.21*	0.17*	0.15*	1						
r D_NO STARTUP EXPERIENCE		-0.44*	-0.18*	-0.22*	-0.22*	1					
s NB OF PRIOR STARTUPS		0.26*		0.13*	0.15*	-0.59*	1				
t D_PRIOR COS		0.21*	0.16*	0.15*	0.19*	-0.39*	0.24*	1			
u NB PRIOR COS		0.10*	0.27*	0.13*	0.18*	-0.40*	0.30*	0.61*	1		
v FORTUNE RANK	0.09	0.44*	0.30*	0.22*	0.23*	-0.63*	0.40*	0.61*	0.75*	1	
w ENTREPRENEURIAL PROMINENCE		0.27*	0.17*	0.16*	0.14*	-0.27	0.24*	0.32*	0.42*	0.42*	1

Pairwise correlations reported.

Coefficient omitted if not significant at the 10% level.

* significant at the 5% level.

Table 5: Rare Events Logit Regressions – Solicitation Characteristics

Dependent variable: Venture Capital Acquisition							
Independent Variable	1	2	3	4	5	6	7
D_PRE_BUST	1.009*		0.968*		1.144*	1.115*	1.127+
	(2.16)		(2.12)		(2.04)	(2.04)	(1.79)
ANGEL ROUNDS	-0.058		-0.050		-0.002		
	(-0.18)		(-0.16)		(0.00)		
D_FOUNDER_INVESTED					0.289		
					(0.53)		
D_NO_AMOUNT_REQUESTED	0.248		0.154		0.880		
	(0.57)		(0.34)		(1.45)		
AMOUNT REQUESTED	0.046+		0.048+		0.032	0.004	-0.016
	(1.86)		(1.95)		(0.74)	(0.12)	(-0.25)
D_BUSINESS PLAN	0.641	0.425	1.303*	1.116*		0.288	0.790
	(1.41)	(1.08)	(2.40)	(2.20)		(0.32)	(0.86)
D_EXECUTIVE SUMMARY	0.177	-0.216	0.83	0.474		-0.277	0.038
	(0.41)	(-0.56)	(1.44)	(0.91)		(-0.32)	(0.05)
D_MEMO OR EMAIL	-0.313	-0.617+	-0.300	-0.599		-0.411	0.051
	(-0.82)	(-1.70)	(-0.78)	(-1.64)		(-0.81)	(0.09)
D_PR MATERIAL	1.064+	0.885	1.087+	0.875		1.250	1.611*
	(1.83)	(1.44)	(1.83)	(1.40)		(1.38)	(1.98)
D_COMPANY PROFILE	0.276	0.088	0.272	0.051		0.479	1.085
	(0.40)	(0.13)	(0.39)	(0.08)		(0.43)	(0.86)
D_BACKGROUND INFO	0.653	0.317	0.575	0.243		0.298	0.037
	(1.39)	(0.79)	(1.26)	(0.62)		(0.49)	(0.05)
D_FINANCIAL INFO	-0.033	-0.364	-0.155	-0.377		-0.230	0.349
	(-0.03)	(-0.35)	(-0.13)	(-0.35)		(-0.21)	(0.32)
D_INVESTMENT INFO	1.113*	1.084*	0.990+	0.996+		0.418	0.855
	(2.11)	(2.03)	(1.86)	(1.87)		(0.36)	(0.74)
D_POWERPOINT	0.005	-0.009	-0.057	-0.014		-0.524	-0.182
	(0.01)	(-0.01)	(-0.09)	(-0.02)		(-0.45)	(-0.22)
D_PRODUCT INFO	0.803	0.878	0.863	0.952		0.315	0.587
	(1.33)	(-1.51)	(1.40)	(1.64)		(0.29)	(0.58)
D_SCREENSHOT	0.687	0.520	0.613	0.441			
	(1.05)	(0.76)	(0.93)	(0.64)			
LN(TEAM SIZE)						0.593	
						(1.47)	
TEAM COMPLETENESS							0.114
							(1.08)
TEAM SPECIALIZATION							0.168
							(0.81)
D_BOD							-0.521
							(-0.82)
PLAN COMPLETENESS			-0.154	-0.150+		-0.088	
			(-1.55)	(-1.80)		(-0.57)	
D_NO TEAM REPORTED						0.767	
						(0.77)	
Revenue Models	Yes	No	Yes	No	No	No	No
Observations	728	728	728	728	428	485	382

Robust z statistics in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Table 6: Rare Events Logit Regressions – Management Teams

Dependent Variable: Venture Capital Acquisition

Independent Variable	Top Management Team				Founding Team			
	Means		Maximums		Means		Maximums	
	8	9	10	11	12	13	14	15
LN(TEAM SIZE)	0.606** (3.39)	0.852** (3.84)	0.391+ (1.71)	0.512* (2.07)				
FOUNDING TEAM SIZE					-0.056 (-0.22)	-0.001 (0.00)	-0.127 (-0.52)	-0.051 (-0.20)
D_BACH_DEGREE	0.275 (0.33)	0.039 (0.05)	0.493 (0.63)	0.218 (0.28)				
D_MASTERS_TECH	-0.011 (-0.02)	-0.155 (-0.19)	0.016 (0.02)	-0.092 (-0.11)				
D_MBA	0.162 (0.22)	-0.210 (-0.30)	-0.081 (-0.11)	-0.554 (-0.81)				
D_NO STARTUP EXPERIENCE	0.475 (-0.62)	0.793 (0.97)	0.069 (0.10)	0.329 (0.47)	0.341 (0.64)	0.482 (0.89)	0.231 (0.39)	0.336 (0.54)
NB OF PRIOR STARTUPS	0.354 (-1.68)	0.412* (1.98)	0.086 (1.17)	0.089 (1.14)	0.22* (2.15)	0.228* (2.45)	0.07 (0.93)	0.093 (1.11)
D_PRIOR_COS	-3.23* (-2.17)	-2.814* (-2.03)	-0.906 (-1.26)	-0.768 (-1.09)	0.297 (0.26)	0.257 (0.22)	0.343 (0.32)	0.434 (0.40)
NB PRIOR COS	-0.178 (-0.86)	-0.154 (-0.60)	-0.080 (-0.67)	-0.058 (-0.45)	0.183 (-1.04)	0.119 (-0.69)	0.099 (-0.62)	0.075 (-0.49)
FORTUNE RANK	0.003 (1.88)	0.003 (1.72)			0.000 (0.18)	0.000 (0.05)	0.000 (0.02)	0.000 (0.13)
ENTREPRENEURIAL PROMINENCE	0.062 (1.69)	0.070 (1.70)	0.024* (2.16)	0.029* (2.21)	0.033 (1.37)	0.027 (1.24)	0.023 (1.21)	0.022 (1.22)
D_PRE_BUST		1.371* (2.02)		1.177+ (1.87)		0.968* (2.04)		1.002* (2.21)
AMOUNT REQUESTED		-0.007 (-0.18)		-0.01 (-0.22)		0.008 (0.25)		0.004 (0.10)
D_BUSINESS PLAN		0.494 (0.59)		0.649 (0.72)		0.452 (0.72)		0.463 (-0.71)
D_EXECUTIVE SUMMARY		-0.324 (-0.43)		-0.232 (-0.29)		0.018 (0.03)		0.025 (0.04)
D_MEMO OR EMAIL		-0.11 (-0.21)		-0.189 (-0.38)				
D_PR MATERIAL		1.708* (2.20)		1.586* (2.11)				
D_COMPANY PROFILE		1.530 (1.23)		1.374 (1.10)				
D_BACKGROUND INFO		0.088 (0.13)		-0.008 (-0.01)				
D_FINANCIAL INFO		0.550 (0.49)		0.674 (0.63)				
D_INVESTMENT INFO		0.850 (0.96)		0.286 (0.26)				
D_POWERPOINT		-0.333 (-0.40)		-0.100 (-0.13)				
D_PRODUCT INFO		0.901 (0.93)		0.867 (1.03)				
Observations	428	428	428	428	485	485	485	485

Robust z statistics in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Appendix

Goldfarb *et al.* (2005) find the focal VC to be a modest VC that invested in smaller deals than the average VC during the period. They find that “the focal VC round sizes were about 30% lower than the VC Industry mean; internet companies financed by the focal VC received less than half the average amount of internet VC targets, the total fund size was much smaller than the industry mean, and the focal VC financed a similar number of companies as the average VC management firm. Given the additional information that this was the only VC fund ever affiliated with this company, [they] conclude that this was not a top-tier VC and would have likely received lower-quality solicitations than high-status VCs” (p. 5).

We compare 36 VC-backed firms from the sample to the general population of entrepreneurial focused VC deals (see footnote 4; including non-PWC deals does not change the results of the comparison). In this way we determine if the funded solicitations in our sample are measurably different from the funded solicitations as judged by the venture community. As our sample was focused on firms soliciting capital between 1998 and 2002, and given our selection on first round funding solicitations, none of our sample firms received funding before 1998, the relevant subset of the general population to be those firms that received first rounds after 1997 and before 2004. This choice is validated in Table A2 where we see that the mean founding year of the business plan sample is not statistically different from the mean founding date of the general population, and the mean first round date for the sample population is only 31 days later

than the general population (this difference is also not statistically significant). We also exploit the Venture Economics Industrial Classification (VEIC) and compare the studied sample to the general population by industry category.

Table A1 reports sample and non-sample VC investment targets by primary and secondary Venture Economics Industry Classification (VEIC). A non-sample target is a company that did not solicit funding from the focal VC, while a sample target is one that did. Subtotals are implied by indentations, e.g., there were 4832 information technology investments, 1183 of which had a secondary VEIC of “Communications and Media”, 559 of which had a tertiary VEIC classification of “Internet Specific”. Just over 42.1% of the sample firms are categorized in the “Internet-specific” subcategory of the broader “Communications and Media” or “Computer Related” categories. These two groups represent only 35.2% of the non-sample firms. 2 of the sample firms were unclassified. Because all but 4 of the funded firms in the sample were information technology (IT) firms, to make the comparison meaningful, we compare summary statistics of only VC-funded IT firms.

Table A2 compares funding round attributes of VC-backed non-sample IT firms to VC-backed sample IT firms. VC-backed non-sample IT firms are all VC target IT companies that did not solicit funding from the Focal VC. VC backed sample IT firms are all VC IT target companies that solicited funding from the focal VC. There are no statistically significant differences between the two samples in the number of first round investors, the average founding date, date of first round, first round amount, first round valuations

and the number of days from founding to first investment. The number of rounds and total invested are lower and date of last investment is earlier for VC-backed sample firms and these differences are statistically significant. The table suggests that VC-backed sample firms were less likely to receive follow up funding than the general population, which presumably reflects the internet specific nature of our sample.

Table A1: Industry Classifications of VC-backed Firms

Industry Major Group	All VC-backed Firms		All VC-backed Firms	
Industry Minor Group	#	as % of VC-backed firms	#	as % of VC-backed BPA firms
Information Technology	4,832	39.3%	34	89.5%
Communication and Media	1,183	19.7%	8	21.1%
Communication and Media	624	10.4%	5	13.2%
Internet Specific	559	9.3%	3	7.9%
Computer Related	3,195	53.1%	24	63.2%
Computer Hardware	206	3.4%	0	0.0%
Computer Software and Services	1,433	23.8%	11	28.9%
Internet Specific	1,556	25.9%	13	34.2%
Semiconductors/Other Electronic	454	7.5%	2	5.3%
Medical/Health/Life Sciences	683	11.4%	1	2.6%
Biotechnology	272	4.5%	0	0.0%
Medical/Health/Life Sciences	411	6.8%	1	2.6%
Non High-Technology	500	8.3%	3	7.9%
Consumer Related	126	2.1%	1	2.6%
Industrial/Energy	100	1.7%	0	0.0%
Other Products	274	4.6%	2	5.3%

Source: Venture Economics, Business Plan Archive

Table A2
Comparison of the Population of VC-backed Firms to VC-backed Sample Firms

Variable	VC-Backed IT Firms	VC-Backed BPA IT Firms	\Delta	Ha: diff \neq 0, t-statistic	Nb VC- Backed IT Firms	Nb VC- Backed BPA IT Firms
Company Rounds	2.76	1.79	0.97	3.96**	4832	34
Nb 1st Round investors	2.51	2.71	0.20	-0.52	4832	32
Total invested (\$K)	26046.00	12632.00	13414.00	5.02**	4720	34
Founding Date	9/15/05	9/10/05	5 days	0.05	4832	34
First Round Date	10/31/00	12/2/00	31 days	0.04	4832	34
Time from founding to first investment (days)	587.60	726.95	139.35	1.16	4644	22
First Round Amount (\$K)	7543.08	6968.77	574.31	0.45	4654	34
Date of last investment (through 2004)	6/3/02	6/13/01	354 days	3.50**	4832	34
Company 1st round valuation	27251.52	26884.63	366.89	0.05	1713	8

Notes: Source: Venture Economics, Business Plan Archive

* Significant at the 95% level, ** significant at the 99% level.