Evaluating Early-Stage Ideas: Evidence from Venture Mentoring*

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Abstract

We provide some of the first clean empirical evidence that it is possible to assess the commercial viability of a venture even in the idea stage. Collaborating with the Massachusetts Institute of Technology's Venture Mentoring Service (VMS), we examine detailed data on 655 early stage venture ideas across a wide range of industry sectors. Venture ideas that receive a more positive evaluation from a large set of skilled practitioners in the New England entrepreneurship and technology community (i.e., the mentors at VMS) are significantly more likely to ultimately reach commercialization with recurring revenue and expenses in the future. This relationship is economically meaningful and statistically significant after controlling for a rich set of venture characteristics. Due to the educational nature and institutional structure of VMS, initial mentor evaluation is unlikely to affect the degree of mentoring a venture receives nor the behavior of the founding team. Econometrically, we also control for mentor-venture interactions and present several robustness checks demonstrating that the intensity of mentoring is not driving our key findings. The evaluations in our setting are based on standardized, concise, and objective venture summaries prepared by VMS staff and focus primarily on the underlying business proposition. Mentors have not met the teams at the time of evaluation. Thus, our results suggest that the business proposition of a venture, even in a very early stage, has some signal value. Leveraging the richness of our data, we further show that such signal value is relatively strong for ventures that focus on developing new technologies but weak for ventures that focus on developing new business models with existing technologies. Our results have important implications for understanding the risks of entrepreneurship and the allocation of entrepreneurial resources.

1 Introduction

New companies transform lives, ignite industries, and drive economies. Those with new and unproven technologies and/or business models are exactly those ventures with the greatest potential for value creation, but they face a high uncertainty of success. A key source of uncertainty is that the commercial viability of a new venture is unknown until their products or services reach the market. Yet, in order for this commercial viability to be realized, entrepreneurs, early employees, investors, and advisors need to devote considerable time and resources in order to develop ideas into testable products or services. Can the commercial viability of a new venture be evaluated in the idea stage? This question has important implications for understanding the underlying risk of entrepreneurship and determining the effective allocation of entrepreneurial resources.

However, empirically identifying the efficacy of new venture evaluation is difficult. There are both conceptual and practical challenges. Conceptually, in most entrepreneurial contexts (e.g., incubators and venture capital investment), the evaluation of a venture idea has a direct impact on its development through resource allocation and signaling to key stakeholders. A more positive evaluation is likely associated with more resources (e.g., investment and mentorship) directed to the venture and encourages entrepreneurs to exert more effort. Practically, it is difficult to obtain the set and track the performance of ventures that receive poor evaluation (e.g., rejected by investors).

Due to the identification challenges and data limitations, few studies examine directly whether the commercial viability of ventures and ventures ideas can be evaluated. The existing literature and anecdotal evidence provide a mixed picture. In the context of venture capital evaluation, Kerr, Nanda, and Rhodes-Kropf (2014) and Kerr, Lerner, and Schoar (2014) use variations in the positive evaluation scores of ventures at the time of financing by a large and established venture capital firm and find limited correlation between the evaluation score and subsequent performance conditional on investment. The results, however, do not allow inference regarding the efficacy of venture evaluation as the study is restricted to those venture that received investments and cannot draw conclusion regarding the firm's ability to evaluate the full spectrum of ventures in their entire choice set. Sorensen (2007) demonstrates that more experienced venture capital firms are better

at sorting (i.e., being matched to better firms ex ante), but in this context sorting is not equivalent to evaluation, as it could also be driven by selection by entrepreneurs (Hsu, 2004) as well as social capital influences (Shane and Stuart, 2002). Even the most successful investors acknowledge the difficulty of evaluation, as Sam Altman, president of Y Combinator, points out that "great companies often look like bad ideas at the beginning." [1]

In this paper, we leverage a unique empirical setting to provide some of the first clean and well identified evidence on the predictability of the commercial viability of an early stage venture. We examine early stage venture ideas brought to Massachusetts Institute of Technology Venture Mentoring Service (VMS), an educational program that connects MIT-affiliated ventures to volunteer mentors from the larger New England entrepreneurship and technology community. Founded in 2000, VMS is one of the oldest university programs that assists aspiring entrepreneurs in the formation and development of new businesses. Inline with its education objectives, VMS provides each venture with a set of mentors confidentially and at no cost. This initial venture-mentor pairing is driven primarily by mentors' expression of interest in mentoring the venture based on a standardized summary and without meeting the founding team. Consistent in tone and form, these descriptions provide an overview of the proposed venture—business model and technology, targeted customers, and current challenges—with limited information regarding the founding team. Expressing interest in a venture is a non-trivial decision that reflects a mentor's willingness to commit their time—one of their most valuable and limited resources—to a venture. Thus, the expression of mentor interest in a venture serves as an indication of their value judgment on the underlying business proposition. VMS then determines the mentor assignment based on scheduling availability and load balancing. The unique design of the venture-mentor pairing process allows us to overcome prior identification challenges and study the efficacy of mentor evaluation.

The aggregate mentor interest measures the mentors' evaluation of a venture and, unlike in most other entrepreneurial contexts, should not drive the level of resources allocated toward a venture due several institutional reasons. First, the program emphasizes entrepreneurial learning,

[1] http://blog.samaltman.com/black-swan-seed-rounds

rather than commercial performance and the type and distribution of resources are inline with these objectives. Second, only semi-random subset of mentors expressing interest in a venture have an opportunity to interact with the venture, with few, if any, mentors become heavily involved. Finally, the ventures themselves drive the extent of mentoring they receive from VMS and have no role in the selection of mentors. Furthermore, aggregate mentor interest is unlikely to drive any behavioral changes, since neither ventures nor mentors observe it.

We collect detailed data on characteristics and outcomes of 655 venture ideas that came to VMS between 2005 and 2012. We examine whether a venture idea that receives a higher level of aggregate mentor interest is more likely to be commercialized—defined as recurring revenue and expenses—in the future. Econometrically, we control for the degree of mentoring using dummies for the number of mentor-venture meetings. We further include a rich set of venture characteristics at the time of entry into VMS such as incorporation status, intellectual property, industry sector, and entrepreneurs' MIT affiliation. We find that a one standard deviation increase in the proportion of active mentors that express interest in a venture implies, on average, a 15% increase in the likelihood of commercialization (or a 3.3 percentage-point increase from the baseline probability of 22%). The relationship is statistically significant at the 5% level. These findings are robust to alternative measures of mentor interest and exclusion of outliers. We also consider likely alternative explanations and provide evidence against them.

Our results suggest that it is possible to evaluate the commercial viability of a venture in the idea stage with a large sample of experts, and that the underlying business proposition has signal value even in early stage ideas. Exploiting the richness of our data, we further examine whether the signaling value of the business proposition depends on whether the venture is primarily developing new technologies versus new business models. We use three different classifications of technology-focused ventures: having intellectual property protection, originating from academic research, or competing in sectors that have a high research and development (R&D) intensity. All three classifications for technology-focused ventures yield consistent results that the relationships between mentor interest and subsequent market validations are strongly positive, statistically significant,

and economically important. In contrast, for those ventures with unproven business models, our results remain weak and inconclusive.

This paper contributes to the literature on the evaluation and professionalization of early stage venture ideas. A large and growing literature establishes the various mechanisms through which venture capital firms professionalize ventures and improve venture outcomes, such as through active mentorship, network access, and control rights (Gorman and Sahlman, 1989; Sahlman, 1990; Lerner, 1995; Hellmann and Puri, 2002; Baum and Silverman, 2004; Hsu, 2004; Kerr et al., 2014). In contrast to the growing literature on the evaluation of scientific ideas (Cole et al., 1981; Chubin and Hackett, 1990; Marsh et al., 2008; Lamont, 2009; Lee et al., 2013; Boudreau et al., 2014), few studies directly examine the evaluation of early stage venture ideas, and existing studies focus largely on the selection criteria instead of efficacy. Contributing to this literature, we provide some of the first well-identified evidence that a venture's underlying business proposition has signal value even in the very early stage before the formation of the business entity. While Kaplan et al. (2009) note that venture capitalists should, at the margin, focus on the venture idea over the founding team in deciding to invest in a venture, Bernstein, Shai et al. (2014)find that experienced early-stage investors focus on early stage ventures founding teams for both a signal of the idea quality and the short-term operational benefits. Our results suggest that effective selection criteria may vary based on a venture's underlying value proposition.

2 Empirical Setting and Research Design

2.1 MIT Venture Mentoring Service

To fill the gap in the university's support of emerging entrepreneurial ventures, MIT Professor David Staelin from the Department of Electrical Engineering and Computer Science and MIT alumnus Alexander Dingee, both highly successful entrepreneurs, founded MIT Venture Mentoring Service in 2000 under the support of Provost Robert Brown. The founding of VMS marked an important first step towards entrepreneurship mentoring finally becoming a standalone compo-

nent to the entrepreneurial ecosystem at MIT. Through VMS, entrepreneurs from the larger MIT community - students, staff, faculty, and alumni - come to VMS with an idea, often at a very early stage, and receive hands-on mentoring from a team of elite volunteer mentors. This service is confidential and provided free of charge.

The primary objective of the program is not to help every venture idea reach commercialization or profitability, but rather to escalate the commercialization potential of the larger university ecosystem through a focus on entrepreneurship education. Sherwin Greenblatt, Director at MIT's Venture Mentoring Services states that "with mentoring, you learn by doing. With a good coach you can learn faster, helping people to develop their full potential." Success for VMS is captured in the learning opportunities even, and perhaps especially, in the venture failures. As a VMS Staff Member notes, "we think it's a success if the prospective entrepreneur decides there isn't a viable business, or that they really don't want to be an entrepreneur now that they get what you really have to do [to be successful]. Not infrequently, participants come back with new ideas and try again; with a better background for becoming successful." Echoing this sentiment, a VMS entrepreneur who decided not to continue pursuing their venture expresses that they "are grateful for [the VMS mentors'] insight and experience that helped drive us to this conclusion far faster than we could have reached on our own."

Even though VMS has an educational focus and is not driven by specific venture outcomes, the ventures associated with VMS have contributed a substantial amount to the local economy. As of July 1, 2014, VMS has worked with over 2,900 entrepreneurs on nearly 1,700 venture ideas. Of these, 188 ideas have launched as ventures raising over $1.6 billion in funding, including grants and investments. Twenty-eight ventures have reached a successful liquidity event (e.g., initial public offering or acquisition) producing over $1 billion market capital. As of the summer of 2014, VMS has nearly 200 ideas working towards a launch, enrolling over 20 new venture ideas per month, and engaging around 150 active volunteer mentors.

2.2 VMS Mentors

The mentors at VMS are experts in business formation and operations and have accumulated their entrepreneurial experiences usually in one of the three ways: founding and growing a new company, leading a new business initiative at an established company, or providing functional services (e.g. legal or financial) to start-ups. The majority of the mentors at VMS have either founded companies or joined a startup as a very early employee. A fair number are serial entrepreneurs, whereas others have stayed at the startup as it grew and become senior executives in a large company. Some mentors have spent most of their careers in established firms, but they have led new business initiatives (e.g. new product lines, new divisions, new markets) and encountered many of the same issues an entrepreneur does in their own startup. A small number of mentors are functional experts, who specialize in a particular functional area such as law and finance. While they may not have direct startup experience as the two previous categories, they have frequently interacted with startups.

Mentors are not compensated for their time and effort devoted to VMS, and the organization prohibits mentors using the service to other ends, such as scouting investments. Most prospective mentors approach VMS as referrals from existing mentors, providing an initial filter for the program. These prospective mentors are then carefully screened by VMS staff, including completing an in-depth personal interview where they must demonstrate a compelling focus and interest in helping entrepreneurs. Prospective mentors that indicate any personal or business agenda, including active professional investors, are not accepted into the program. Furthermore, every mentor must sign an agreement that specifies rigorous guidelines and a code of ethics that encourages transparency and limits conflicts of interest. VMS monitors mentor activity and takes swift action to remove mentors from the program that violate these practices. On very rare occasion, in the natural progression of the mentoring relationship a venture will seek a mentor out for a more formal role, such as CEO or board advisor, within their firm. If the mentor accepts this new role, VMS assigns a new mentor to the venture and evaluates the prior mentor on a case-by-case basis. This care is done to ensure that the program remains focused on the entrepreneurs and educational

tenets of the program.

VMS estimates that an average active mentor commits over 100 hours of volunteer time annually. Mentors report that they devote this time for a variety of reasons. Among the most common motivations are appreciating the intellectual appeal of the work, wanting to stay engaged in the greater Boston entrepreneurship community, and enjoying assisting new entrepreneurs develop. Shared among the mentors is a sense that "mentoring entrepreneurs is a way to give back for all the help that I received in my career." Another mentor says he or she joined VMS in order "[t]o add some structure, purpose and focus to life, and, hopefully, use my experience to the benefit of people just starting out. And to be challenged a bit."

2.3 Initial Screening of Venture Ideas

Given the educational nature of the program, VMS imposes only minimal requirements on the backgrounds of entrepreneurs or the quality of ideas. In order to be eligible for mentoring, the venture idea must have at least one active entrepreneur with a connection to MIT (e.g., students, alumni, faculty, and staff) and must be based in the greater Boston area.

Conditional on eligibility, the only criteria VMS impose on the venture are that the entrepreneurs exhibit seriousness about learning entrepreneurship and that the idea provides the context and focus for practical education on the venture creation process. Entrepreneurs typically come to VMS at very early stages in their idea process—before there is a business plan, a strategy and revenue model, a team, or any funding. Few entrepreneurs are pursuing the venture idea full-time when they join VMS, and most of the venture ideas are not incorporated.

2.4 Matching between Venture Ideas and Mentors

After a venture joins, VMS assigns mentors to the venture primarily based on the expression of interest by mentors. Upon initial consultation with the venture founder(s) and drawn from the venture enrollment form, a member of the VMS staff distills the venture idea into a brief written description. The same VMS staff member has prepared almost all of the summaries throughout

our sample period (from 2005 and 2012). The summary includes the following information:

- a sentence stating what the venture does in a straightforward manner, avoiding buzzwords and technical jargons;
- additional information describing potential customers and products;
- brief information on the founding team, including their MIT affiliation (e.g. student, faculty);
- the type of help needed by the venture, any relevant challenges, problems, and/or known critical issues (e.g., intellectual property and legal problems, conflicts within the founding team).

Sample anonymized written descriptions are provided in Table A.1 in the Appendix. Given the educational nature of the program, VMS presents all ventures in a positive and optimistic manner. For ventures that have a strong technological component, the underlying technology is rarely questioned. At the same time, challenges and problems are not hidden, as they provide relevant facts and issues facing the entrepreneurs and the assistance they will need.

VMS emails the venture summaries in regular batches to all active VMS mentors and also delivers them verbally at the monthly mentor meetings. The information in the verbal presentation is essentially the same as in the written description, as in most cases the summary is simply read to the group. Based on the description, mentors indicate whether they are interested in working with a specific venture. Since the mentors receive the descriptions and express their interest primarily through email, the evaluation is performed independently and only VMS knows the aggregate interest level.

Expressing interest indicates a mentor's serious willingness to commit to a venture, since time is their most precious resource. Mentor selection criteria are, of course, as varied as there are mentors. Interviews with mentors suggest that interest in the underlying technology and/or business idea is the primary driver of mentor interest. One mentor reports that his or her interest is based on the "novelty of the idea and whether it offers some positive value to some group of people and/or

the planet." Another mentor, sharing similar criteria, indicates that "I volunteer if the technology and/or the application is interesting to me." Others mentors base their evaluation partially on the relevance of their experiences and knowledge. However, not all mentors look for ventures that are similar to their own backgrounds. One mentor expresses that he or she is "most intrigued by the ventures that are the furthest from my own professional experiences," which is not a unique view among the mentors. Finally, some mentors also look for passion from the entrepreneurs, although the brief summary often provides only limited evidence. Overall, mentor interest is likely to represent a value judgement on the venture idea.

Mentor interest is not used as a program metric or in program evaluation. VMS uses the interest data only for the initial mentor-venture pairing process. Since VMS sets the mentor team size to two to four volunteer mentors and there are often more mentors expressing interest than the team size, usually only a semi-random subset of mentors expressing interest in a venture have the opportunity to interact with the venture. Conditional on indication of interest, VMS assigns mentors to ventures primarily based on mutual scheduling constraints and load balancing. Ventures neither select their initial set of mentors nor know their aggregate mentor interest.

2.5 Mentoring at VMS

Given the emphasis on entrepreneurial education, VMS ensures that access to mentoring resources is evenly distributed across ventures. The ventures alone, however, determine the extent of mentoring they receive from VMS. After being paired with their mentors, ventures are solely responsible for initiating meeting requests whenever they need assistance. These meeting request are almost always accommodated. However, since venture requests come at random times and mentors typically have hectic schedules, only a subset of paired mentors usually meets with a venture in a given meeting. Over time, the actual active mentor group may change as different knowledge, skills, and experiences become more useful as the venture proceeds along its path. These later-stage mentors are not restricted to those mentors that initially expressed interest in the venture. In fact, in many cases these mentor-venture pairings may be initiated based on the specific skills of the mentor

and/or facilitated through informal meetings at VMS events. As a result, few mentors who express initial interest in a venture become heavily involved in the venture.

While VMS program assessment is outside the scope of this paper, the program is highly regarded by entrepreneurs, the entrepreneurship community, and university educators alike. Venture founders report that they seek out VMS as "a safe zone... and forum to discuss aspirations, risks and potential solutions" and to obtain specific, constructive feedback to establish and scale their ventures. One interviewed entrepreneur comments that VMS "provided the critical help when it was the most dangerous to make [the] decisions... that could make or break the company." Another one says that they "never could have anticipated the depth and quality of support" provided.

VMS has received the Adolf F. Monosson Prize for Entrepreneurship Mentoring and the National Consortium for Continuous Improvement in Higher Education Leveraging Excellence Award. It has also been recognized for innovation in entrepreneurship education and identified as a model program by the Ewing Marion Kauffman Foundation. VMS has attracted inquiries and visits from academic institutions, economic development organizations, and entrepreneurship programs worldwide. Over forty organizations worldwide have established mentoring programs based on the VMS model, including Harvard University, Yale University, Boston University, Washington University in St. Louis, Pennsylvania State University, Columbia University, New York University, Duke University, and the University of Pittsburgh.

2.6 Advantages of the Research Design

For the purpose of this research, the VMS setting provides several advantages for identifying the evaluation of commercial viability of venture ideas. First, there is minimal pre-screening of venture ideas by VMS, and thus mentors are evaluating a wide range of ideas. Second, mentors are evaluating ventures based on standardized information and the evaluation is performed independently. Finally, as a result of the unique institutional structure at VMS, mentors' aggregate evaluation is unlikely to drive differential degrees of mentoring and is unknown to the ventures.

3 Data and Descriptive Statistics

3.1 Venture Sample

Our sample for analysis includes all ventures ideas that joined VMS between 2005 and 2012. We exclude the initial cohorts of ventures from when VMS first started in 2000 as there were only a small number of ventures and mentors, both of which may have been selected through their connections with the founders of VMS. By late 2004, however, VMS had grown substantially, undertaken considerable effort to increase awareness of their services in the larger MIT community, and introduced systematic electronic record keeping. Figure 1 plots the number of new ventures joining VMS during our sample period. We also exclude for the purposes of this study seven ventures that were already funded upon joining VMS, leaving 655 ventures.

Table 1 presents the definitions and summary statistics of the full observed venture characteristics upon entry to VMS during our sample period. Given the connections to MIT, it is not surprising that a fair proportion of the ventures have a strong technological component. Around 24% of the ventures have intellectual property protection (e.g., patents or patent pending) at the time of entry while 16% are based on academic research. The most common industry sectors are consumer web and mobile (27%), B2B software (18%), hardware (15%), and life sciences and medical devices (14%). Other sectors represented include consumer products (13%), energy (6%). The remaining 7% of ventures combine ventures in finance or consulting as well as non-profits and life style businesses. Overall, sectors with high research and development intensities (life sciences and medical devices, hardware, and energy) reflect 35% of the sample.[2]

Only 17% of the ventures are incorporated when they join VMS. Around 38% and 36% of the venture ideas come from students and alumni, respectively. The rest primarily comes from post-doctorate fellows, research associates, and staff (24%), and only two percent coming from faculty members.

[2]We follow the definition used by the National Science Foundation at http://www.nsf.gov/statistics/seind06/c8/c8.cfm?opt=9.

3.2 Measuring Initial Mentor Interest

Our main independent variable, *MENTOR_INTEREST,* is calculated as the percent of active mentors who express interest in a venture shortly after the venture joins VMS. This measure accounts for the size of the active mentor pool. In addition, we use the number of mentors expressing interest (*MNTR_INTEREST_COUNT*) as an alternative measure. As discussed in Section 2.5, most of the mentors who express interest in a venture either never meet the venture or interact with it only briefly. Thus, *MENTOR_INTEREST* and *MNTR_INTEREST_COUNT* include all mentors who express initial interest regardless of whether they would meet the venture later. For robustness checks, we split *MENTOR_INTEREST* into two ratios: the percent of active mentors who express initial interest and would meet with the venture later (*MENTOR_INVOLVE*) and the percent of active mentors who express initial interest and would never meet with the venture (*MENTOR_INTERESTONLY*).

We exclude the full-time VMS staff from the active mentor pool as they meet with all prospective entrepreneurs prior to venture evaluation to discuss the VMS program and summarize the venture's idea for disclosure to the volunteer mentors. The number of active mentors increases during our sample period from 81 in 2005 to 172 in 2012, with over 120 mentors active on average per year. In total, there are 244 mentors who have been active during our sample period.

Since mentors may take their time to respond to the descriptions and their responses may not immediately be recorded in the system, we include all indications of interests expressed within two months after a venture becomes eligible for mentoring.[3] However, it is not uncommon for a mentor not initially interested in a venture to become interested as the venture develops. We exclude these cases when calculating initial interest as they may be driven by a venture's positive progress, information provided by other mentors, and/or other interactions and events within VMS.

On average, a new venture interests around 4.6% of the active mentors when it joins VMS, with variance in percent interested from less than 0.6% to more than 12% (Table 1). An average new venture attracts around 6.4 mentors, which is larger than the typical mentor team size (two to four).

[3]Our empirical results are also robust to using 1.5 months or three months as the cutoff.

Table A.2 lists the frequency of the initial mentor interest by the count of mentors. The majority of ventures attract interest from between three and eleven mentors. Comparing *MENTOR_INVOLVE* to *MENTOR_INTERESTONLY* in Table 1 suggests that interested mentors more often would not meet with the venture.

3.3 Measuring Venture Outcomes

We collect a rich set of venture outcomes to measure the progress of and the market response toward each venture. Our primary outcome of interest, $COMMERCIALIZATION$, captures the commercial viability of the venture. It is an indicator that equals one if the venture successfully reached the stage of commercialization, with recurring revenue and expenses associated with the sales of products and/or services that are the business objective of the company. In other words, there is a reasonable expectation of repeated business and new customers. This would not include revenue from one-off "consulting services" or "pilot test fees," which are often employed as bootstrap financing vehicles but do not establish the business objective. Commercialized ventures have created products and/or services that received validation from the customers,

We also consider other venture milestones. $LAUNCH$ is an indicator that equals one if at least one of the founding entrepreneurs ever pursued the venture full-time. This would exclude those that pursued the venture part-time while enrolled in and/or employed at the university. $INVESTOR$ is an indicator that equals one if the venture ever received funding from angel investors and/or venture capitalists. We exclude crowd funding, grants from government, and investments from friends and family in this definition, since the criteria and purposes of those funding channels vary widely. $ACTIVITY$ is an indicator that equals one if the venture ever generated meaningful economic activities. These include hiring employees, renting space, investing in physical assets, consuming services, paying taxes and fees and more. During this period, the venture may use funding from various sources (primarily grants and investment capital) to provide for the resources needed to operate. $EXIT$ is an indicator that equals one if the venture ever had a liquidity event such as an acquisition or Initial Public Offering. Collectively, these measures depict a clear image of the

growth and impact of a venture idea.

Since we are interested in the furthest progress a venture has ever made to date, our outcomes do not necessarily describe the current status of a venture. Rather, our outcomes intend to capture the potential economic impact that a venture has ever created. Furthermore, survival metrics do not measure venture performance effectively since they are likely driven by the underlying technology or industry of the venture (e.g., life science ventures may take longer to fail than web-services ventures) (Arora and Nandkumar, 2011).

VMS tracks the funding received by the ventures and the liquidation events. We hand collected the outcome measures other than *INVESTOR* and *EXIT* for the purpose of this research using the rich archival data at VMS and internet search. These additional outcome measures are not used for program evaluation by VMS or its stakeholders.

In our sample, approximately 22% of the ventures commercialized, 47% launched, 19% raised funding from investors, 38% generated meaningful economic activities, and 2.1% had liquidity events (Table 1). Not surprisingly, these variables are positively correlated (Table 2). Among the 147 ventures that reached commercialization, 72 ventures never received funding from professional investors, but they all have generated meaningful economic activities.[4] Thirteen out of the fourteen ventures that had liquidity events commercialized, and one venture was acquired before reaching commercialization.

4 Venture Outcomes and Mentor Interest: Empirical Results

4.1 Regression Specification

We use the following specification to examine the relationship between the aggregate level of initial mentor interest and the subsequent commercial viability of the venture:

[4]Some ventures avoid diluting equity by boot strapping, relying on personal finances, help from friends and family, small grants, one-off consulting services, crowd funding, and/or winnings from business plan competitions.

$$Pr(COMMERCIALIZATION_i) = \alpha + \beta MENTOR_INTEREST_i + \gamma D_i^{START_YEAR} + \delta(Controls)_i + \varepsilon_i \quad (1)$$

where i denotes a venture, *COMMERCIALIZATION* is as discussed in Section 3.3, and *MENTOR_INTEREST* is as described in Section 2.4.

The key coefficient of interest is β, which measures whether a venture that attracts more mentor interest in its very early form is more likely to be commercialized in the future. Since we do not observe the outcomes over time, we cannot control for calendar year fixed effects as well as start-up age fixed effects. Instead, we include dummies for the values of *START_YEAR*. Some of the newer ventures may still be working towards commercialization as of the summer of 2014 when we collected the outcomes data. Because of this truncation, our data may underestimate the likelihood that the ventures in our sample would eventually reach commercialization. This should bias against finding a positive relationship between *MENTOR_INTEREST* and $COMMERCIALIZATION_i$.

We also include a rich set of venture characteristics observed when the ventures join VMS, since these characteristics could drive both mentor interest and commercial viability. Thus, we examine whether mentors could evaluate a venture's commercial viability beyond picking up on the obvious venture characteristics, such as its primary industry sector or underlying technological intensity. The main empirical concern is that *MENTOR_INTEREST* may directly affect a venture's growth and outcomes in two ways. First, it may change the degree of mentoring that a venture receives from VMS. As discussed in detail in Section 2, this is unlikely given the educational focus and practical structure of VMS. Second, it may somehow change the entrepreneurs' behaviors. This is also unlikely since ventures do not receive any information on the aggregate level of mentor interest.

Econometrically, we control for the intensity of mentoring using the number of meetings that a venture has had with VMS. While we do not observe all of the interactions between VMS mentors

and ventures[5] or their causal effect on ventures' progress, we expect that, on average, ventures that had a higher number of mentor meetings should have received more mentoring. We use the total number of meetings as opposed to the frequency of meetings to capture the total impact that VMS may have had on a venture.[6] Table 1 shows that on average, a venture only meets with VMS mentors around three times. Table A.3 shows that nearly 56% of the ventures have met with the VMS mentors twice or fewer times, with less than 23% of the ventures meeting with VMS more than four times. Table 2 shows that the correlation between *MENTOR_INTEREST* and number of meetings is 0.19.

4.2 Main Results

Table 3 presents the OLS estimates of Equation (1) using different levels of controls as well as alternative measures of mentor interest. The Logit estimates are nearly identical (see Table A.4 in the Appendix).

Column (1) shows that a venture that receives more interest from mentors when it first joins VMS is also more likely to successfully commercialize later. The magnitude of the coefficient estimate is economically meaningful and statistically significant at the 1% level. A one standard deviation increase in *MENTOR_INTEREST*, which is 2.57 percentage points, implies on average a 5.14 percentage point increase in the probability of recurring revenue and expenses (a 23.4% increase from the baseline probability of 22%).

Columns (2) through (4) show how the estimated relationship between commercialization and mentor interest changes with the inclusion of additional controls for observed venture characteristics at entry to VMS. Column (2) controls for the characteristics that may reflect the maturity or underlying value of the venture idea at entry—having intellectual property, being based on academic research, and/or establishing incorporation. The coefficient estimate on mentor interest is still positive and significant, although the magnitude decreases. Consistent with our interviews,

[5]For instance, we do not track email exchanges between them.

[6]Also, it is difficult to measure frequency without errors, especially for venture ideas that have failed, since it is hard to know the precise timing of a failure.

the comparison between Columns (1) and (2) suggests that mentors are not expressing their interest randomly, even though there are no financial investment or professional relationships involved. Rather, at least some of their evaluation is based on venture characteristics that positively predict commercial viability. Columns (3) and (4) show that adding entrepreneurs' MIT affiliation and industry controls has little impact on the coefficient estimate.

Column (5) includes the number of meetings in addition to all of the observed venture characteristics, and Column (6) uses dummy variables for each number of meetings[7] to impose only minimal assumptions on how the number of meetings may influence the likelihood of commercialization. Not surprisingly, the number of meetings with VMS mentors is positively correlated with the outcome on average, but the standard errors are also large. For the purpose of this paper, we do not need to distinguish between meetings with VMS having a causal impact on a venture's growth or a venture that grows more needing more support. Importantly, the coefficient estimate on *MENTOR_INTEREST* remains unchanged. Including number of meetings or its dummies also does not impact the other coefficient estimates or the adjusted R^2.

Our preferred specification is Column (6), which controls for all of the observed venture characteristics as well as dummies for the number of meetings. Even with the rich set of controls, *MENTOR_INTEREST* still has an economically meaningful, positive, and statistically significant relationship with the likelihood of commercialization. A one standard deviation increase in *MENTOR_INTEREST* (2.57 percentage points) implies on average a 3.34 percentage-point (or 15.2%) increase in the probability of commercialization, and the relationship is statistically significant at the 5% level. In comparison, a one standard deviation increase in number of meetings implies on average only a 1.2 percentage-point increase in the likelihood of commercialization, which is also statistically insignificant.

To show that the results are not driven by the extreme outliers in mentor interest, Column (7) winsorizes the outliers at the top and bottom 5% levels to reduce their influence, and the estimated relationship between mentor interest and the likelihood of commercialization is almost identical

[7] ventures whose number of meetings is nine or above serve as the base group

to the one estimated in Column (6). Column (8) uses the count of mentor interest (i.e., how many mentors express interest) as an alternative measure of mentor interest and yields the same finding qualitatively and quantitatively. A one standard deviation increase in the count of mentor interest (3.7) implies on average a 3.33 percentage-point increase in the likelihood of commercialization.

4.3 Excluding Alternative Explanations

The main concern is that *MENTOR_INTEREST* may directly affect the resources that a venture receives from VMS or the behaviors of the entrepreneurs, both of which in turn may influence its future outcomes. In addition to the institutional details, we also provide econometric evidence in Table 4 to exclude these alternative explanations.

Since the dummies for the number of meetings may not capture all of the influence that the mentors may have had on a venture, we split *MENTOR_INTEREST* into two ratios, one for mentors who expressed interest and met with the venture (*MENTOR_INVOLVE*) and the other for mentors who expressed interest but then never met with the venture (*MENTOR_INTERESTONLY*). This is a conservative distinction since many mentors only meet with a venture once or twice. Column (1) shows that the coefficient estimates on both variables are positive but only significant for *MENTOR_INTERESTONLY,* suggesting that the relationship between overall mentor interest and likelihood of venture commercialization is not driven by the percentage of mentors actively involved with the venture.

Next, we consider the possibility that ventures that have few interested mentors may have received disparate or less mentor engagement. When few mentors express interest to work with a venture, VMS formally recruits mentors and/or VMS staff to complete the mentor team. Though it is against VMS principles, one may be concerned that the recruited mentors may not be as engaged as those who expressed initial interest in a venture. Furthermore, there is a small possibility that a venture which receives few mentor interests and has a small mentor team may take the size of the mentor team as a negative signal and feel discouraged about pursuing the venture.[8] In Column

[8]Even though ventures do not know the average mentor team size.

(2), we only include the ventures that received interest from four or more mentors, since a typical mentor team has two to four mentors excluding the VMS staff. The magnitude of the coefficient estimate on *MENTOR_INTEREST* is slightly larger compared to Column (6) in Table 3 and the estimate remains statistically significant at the 10% level. Columns (1) and (2) in Table 4 lend further support that, inline with their institutional goals, VMS does not differentiate access to mentoring resources based on mentors' initial interest.

Finally, another alternative explanation for our main finding is that mentors select on the same criteria as professional start-up investors, who may or may not be evaluating venture ideas effectively. In other words, venture capitalists and angel investors may have a specific bias or preference for which ventures to fund and such bias may not be optimally aligned with ventures' potential commercial viability (for instance due to investors' risk preferences or lack of capability to evaluate viability). In this case, some of the ventures that receive a high level of mentor interest may not be more commercially viable ex ante, but they would receive subsequent access to funding and resources from early-stage investors who share the same bias and thus are more likely to be commercialized. To test the likelihood of this explanation, Column (3) estimates the relationship between *MENTOR_INTEREST* and *COMMERCIALIZATION* separately for ventures that have received funding from professional investors and ventures that have not received such investments. Conditional on receiving funding, *MENTOR_INTEREST* does not have a strong or significant relationship with the likelihood of commercialization. However, the correlation is strong and significant at the 5% level for ventures that are not funded by professional investors. This suggests that the relationship between mentor interest and venture commercialization is not driven by the potential sharing of bias between mentors in our sample and early-stage investors.

4.4 Using Other Venture Milestones as the Outcome

We examine the relationships between mentor interest and various venture milestones—$LAUNCH$, $INVESTOR$, $ACTIVITY$, and $EXIT$—which are defined in Section 3.3. We use the same specification as Equation (1) and include the same control variables as in Column (6) of Table 3. Figure **3**

plots the coefficient estimates and 95% confidence intervals for *MENTOR_INTEREST* with the different milestones being the dependent variables. Initial mentor interest has an increasingly strong and significant relationship with each milestone between *LAUNCH* and *COMMERCIALIZATION*. However, the coefficicent on *MENTOR_INTEREST* for *EXIT* is negative and almost signicant.

4.5 Interacting with Technological Intensity

Finally, we study how the relationship between initial mentor interest and subsequent commercialization varies by whether a venture is technology-focused. We estimate:

$$\begin{aligned} Pr(COMMERCIALIZATION_i) &= \alpha + \beta_1 MENTOR_INTEREST_i * (X_i = 1) \\ &\quad + \beta_2 MENTOR_INTEREST_i * (X_i = 0) \\ &\quad + \beta_0 X_i + \gamma(Controls)_i + \varepsilon_i \end{aligned} \tag{2}$$

where X_i is one of three measures of whether a venture is technology-focused: whether it has intellectual property protection when joining VMS (*ENTRY_IP*), whether it is based on academic research (*RESEARCH_BASED*), and whether it is in a sector with high R&D intensity (*RD_SECTOR*). Thus, β_1 measures the relationship between mentors' initial interest and venture outcomes for technology-focused ventures, and β_2 measures the relationship for other ventures. We use the same controls as our preferred specification reported in Column (6) of Table 3.

Table 5 shows that the prior relationship between initial mentor interest and subsequent commercialization is mainly driven by technology-focused ventures, and the results are consistent across all three classifications of technology-focus. For ventures that are not focused on technology, the coefficients on *MENTOR_INTEREST* are weaker and have no statistical significance. Figure 4 plots the coefficient estimates and 95% confidence intervals across venture milestones separately for technology-focused ventures and non technology-focused ventures. Similarly, the relationships between *MENTOR_INTEREST* and the other venture outcomes are also driven pri-

marily by technology-focused ventures.

These results suggest that the signal value is strong for technology-focused ventures, where new technologies are a critical part of the value proposition. This is not driven by unique technological expertise among the mentors in our sample, as nearly half of the mentors in our sample do not have graduate degrees. Mentors are also evaluating ventures mostly outside of their functional and industry expertise. For non-technology-focused ventures, our results are inconclusive. The primary explanation is that the signal value is weak for these ventures. However, it is also possible that the mentors in our sample exert more effort in evaluating the technology-focused ventures, or that the non-technology-focused ventures in our sample have a high variance.

5 Conclusion

We leverage the unique empirical context and rich archival data at Massachusetts Institute of Technology's Venture Mentoring Service to show that it is possible to assess the commercial viability of a venture in its idea stage based only on succinct summary and without meeting the team. Ventures that attract more aggregate mentor interest when they join VMS at the idea stages are also more likely to subsequently reach commercialization as a company. We provide both institutional and econometric evidence that this initial evaluation is unlikely to affect a venture's natural development through differential mentoring resources or influence on the entrepreneurs' behaviors. Our results suggest that even in the early stages, a venture's underlying business proposition has signal value that can be extracted with a large sample of experts. Such signal value is particularly strong for ventures that focus on developing new technologies as opposed to ventures that develop new business models with existing technologies.

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Tables and Figures

Table 1: Descriptive Statistics for Venture Characteristics, Interactions with VMS, and Venture Outcomes

Variable	Definition	Obs	Mean	Std. Dev.	Min	Max
Venture Characteristics						
START_YEAR	Year the venture joined VMS	655	2009.9	1.96	2005	2012
ENTRY_IP	Whether the venture has intellectual property at the time of entry	655	0.24	0.43	0	1
RESEARCH_BASED	Whether the venture is based on academic research	655	0.16	0.37	0	1
SECTOR_CP	Venture sector: consumer products	655	0.13	0.34	0	1
SECTOR_CWM	Venture sector: consumer web/mobile	655	0.27	0.45	0	1
SECTOR_ENGY	Venture sector: energy	655	0.06	0.23	0	1
SECTOR_HW	Venture sector: hardware	655	0.15	0.36	0	1
SECTOR_SW	Venture sector: B2B software	655	0.18	0.38	0	1
SECTOR_LSMD	Venture sector: life sciences and medical devices	655	0.14	0.35	0	1
SECTOR_OTHER	Venture sector: consulting/life style/finance	655	0.07	0.25	0	1
RD_SECTOR	SECTOR_LSMD + SECTOR_HW + SECTOR_ENERGY	655	0.35	0.48	0	1
ENTRY_INCORP	Whether the venture is incorporated at the time of entry	655	0.17	0.38	0	1
AFFLI_STUDENT	Whether the primary contact person is an MIT student	655	0.38	0.49	0	1
AFFLI_ALUMNI	Whether the primary contact person is an MIT alumni	655	0.36	0.48	0	1
AFFLI_FACULTY	Whether the primary contact person is an MIT faculty	655	0.02	0.12	0	1
Interactions with VMS						
MENTOR_INTEREST	$\frac{\text{Num. mentors expressing interest}}{\text{Num. active mentors}} \times 100$	655	4.58	2.57	0.56	12.17
MNTR_INTEREST_COUNT	Num. mentors expressing interest	655	6.40	3.70	1	20
MENTOR_INVOLVE	$\frac{\text{Num. mentors expressing interest \& having met with the venture}}{\text{Num. active mentors}} \times 100$	655	2.14	1.61	0	9.09
MENTOR_INTERESTONLY	$\frac{\text{Num. mentors expressing interest \& having not met with the venture}}{\text{Num. active mentors}} \times 100$	655	2.44	2.22	0	9.84
MEETINGS	Num. meetings with VMS mentors	655	3.25	3.11	0	21
Main Outcome of Interest						
COMMERCIALIZATION	Whether the venture has recurred revenue and expenses	655	0.22	0.42	0	1
Other Milestones						
LAUNCH	Whether the venture has had an entrepreneur pursuing it fulltime	655	0.47	0.50	0	1
INVESTOR	Whether the venture has received funding from investors	655	0.19	0.39	0	1
ACTIVITY	Whether the venture has generated meaningful economic activities	655	0.38	0.49	0	1
EXIT	Whether the venture has had a successful liquidation event	655	0.02	0.14	0	1

Table 2: Correlation Table

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) COMMERCIALIZATION	–													
(2) LAUNCH	0.57	–												
(3) INVESTOR	0.45	0.50	–											
(4) ACTIVITY	0.68	0.83	0.58	–										
(5) EXIT	0.25	0.16	0.20	0.19	–									
(6) MENTOR_INTEREST	0.15	0.15	0.12	0.19	-0.02	–								
(7) MNTR_INTEREST_COUNT	0.07	0.07	0.04	0.10	-0.09	0.93	–							
(8) MENTOR_INVOLVE	0.25	0.33	0.24	0.33	0.13	0.52	0.29	–						
(9) MENTOR_INTERESTONLY	0.00	-0.07	-0.03	-0.02	-0.12	0.78	0.87	-0.13	–					
(10) MEETINGS	0.19	0.34	0.21	0.36	0.06	0.19	0.09	0.43	-0.10	–				
(11) START_YEAR	-0.29	-0.28	-0.22	-0.28	-0.20	-0.17	0.15	-0.58	0.22	-0.25	–			
(12) ENTRY_IP	0.26	0.30	0.30	0.34	0.19	0.23	0.15	0.24	0.09	0.21	-0.23	–		
(13) RESEARCH_BASED	0.18	0.21	0.22	0.23	0.08	0.22	0.17	0.25	0.08	0.26	-0.14	0.67	–	
(14) RD_SECTOR	0.10	0.18	0.13	0.20	0.02	0.29	0.26	0.19	0.19	0.09	-0.10	0.47	0.42	–
(15) ENTRY_INCORP	0.38	0.39	0.25	0.42	0.19	0.09	0.02	0.27	-0.09	0.22	-0.28	0.34	0.17	0.17

Table 3: Estimated Relationship between COMMERCIALIZATION and Mentor Interest in OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MENTOR_INTEREST	0.020***	0.013**	0.012*	0.014**	0.013**	0.013**		
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)		
MENTOR_INTEREST							0.014**	
(Winsorized at 5%)							(0.007)	
MNTR_INTEREST_COUNT								0.009**
								(0.004)
ENTRY_IP		0.060	0.064	0.064	0.066	0.064	0.064	0.064
		(0.051)	(0.051)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
RESEARCH_BASED		0.048	0.063	0.097*	0.087	0.075	0.076	0.076
		(0.058)	(0.058)	(0.057)	(0.057)	(0.056)	(0.056)	(0.056)
ENTRY_INCORP		0.322***	0.315***	0.308***	0.303***	0.314***	0.314***	0.312***
		(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
MEETINGS					0.004			
					(0.006)			
Meeting Dummies	No	No	No	No	No	Yes	Yes	Yes
Sector Controls	No	No	No	Yes	Yes	Yes	Yes	Yes
Entrepreneur Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Start Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	655	655	655	655	655	655	655	655
Adjusted R^2	0.10	0.19	0.19	0.21	0.21	0.21	0.21	0.21

Notes: Coefficients estimated from Linear Probability Model. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. See Table 1 for variable definitions. Meeting Dummies include indicator variables for the values of MEETINGS. "Sector Controls" include SECTOR_CP, SECTOR_CWM, SECTOR_ENGY, SECTOR_HW, SECTOR_SW, and SECTOR_LSMD. "Entrepreneur Controls" include AFFLI_STUDENT, AFFLI_ALUMNI, AFFLI_FACULTY. "Start Year Dummies" include indicator variables for all the values of START_YEAR.

Table 4: Robustness Checks on Estimated Relationships between COMMERCIALIZATION and MENTOR_INTEREST in OLS

	(1)	(2)	(3)
Sample	Full	MNTR_INTEREST_COUNT$\geq$ 4	Full
MENTOR_INVOLVE	0.012		
	(0.014)		
MENTOR_INTERESTONLY	0.014*		
	(0.008)		
MENTOR_INTEREST		0.016*	
		(0.009)	
MENTOR_INTEREST x (INVESTOR = 1)			0.003
			(0.014)
MENTOR_INTEREST x (INVESTOR = 0)			0.013**
			(0.006)
INVESTOR			0.412***
			(0.088)
N	655	496	655
Adjusted R^2	0.21	0.21	0.31

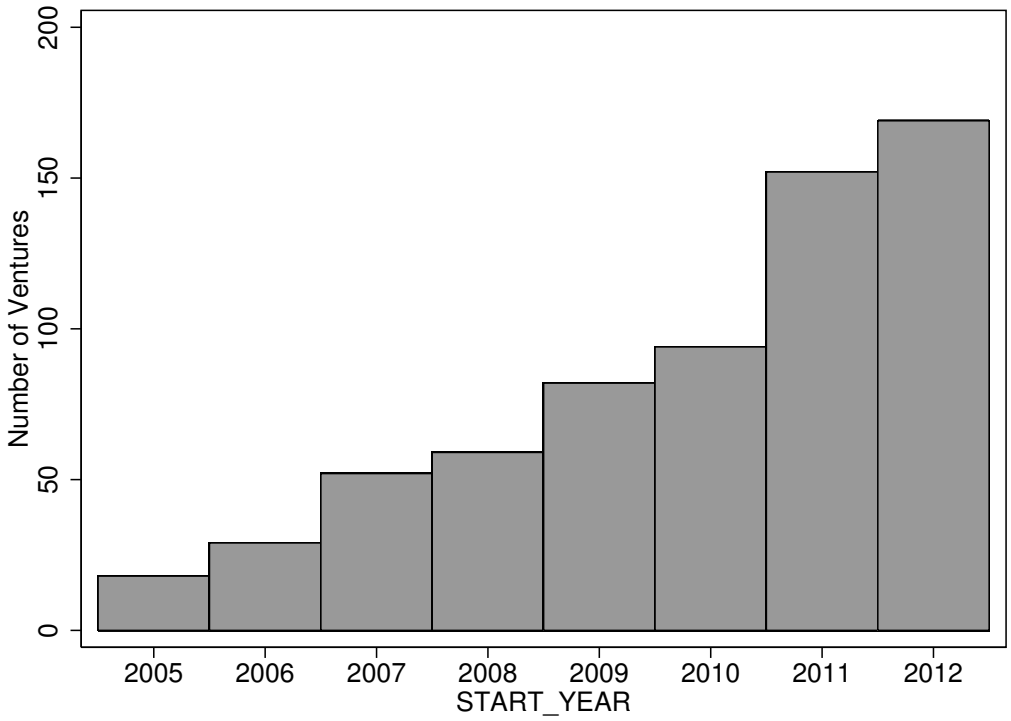
Notes: Coefficients estimated from Linear Probability Model. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. See Table 1 for variable definitions. All specifications include indicator variables for the values of MEETINGS, ENTRY_IP, RESEARCH_BASED, ENTRY_INCORP, AFFLI_STUDENT, AFFLI_ALUMNI, AFFLI_FACULTY, SECTOR_CP, SECTOR_CWM, SECTOR_ENGY, SECTOR_HW, SECTOR_SW, SECTOR_LSMD, and indicator variables for the values of START_YEAR.

Table 5: Estimated Relationship between COMMERCIALIZATION and MENTOR_INTEREST by Technological Intensity in OLS

	(1)	(2)	(3)	(4)
MENTOR_INTEREST	0.013**			
	(0.007)			
MENTOR_INTEREST x (ENTRY_IP = 1)		0.021*		
		(0.013)		
MENTOR_INTEREST x (ENTRY_IP = 0)		0.010		
		(0.008)		
MENTOR_INTEREST x (RESEARCH_BASED = 1)			0.033**	
			(0.014)	
MENTOR_INTEREST x (RESEARCH_BASED = 0)			0.008	
			(0.007)	
MENTOR_INTEREST x (RD_SECTOR = 1)				0.025**
				(0.011)
MENTOR_INTEREST x (RD_SECTOR = 0)				0.005
				(0.008)
F-Statistics	–	0.61	2.32	2.24
ENTRY_IP	0.064	0.007	0.058	0.066
	(0.052)	(0.084)	(0.052)	(0.052)
RESEARCH_BASED	0.075	0.068	-0.061	0.073
	(0.056)	(0.057)	(0.097)	(0.056)
N	655	655	655	655
Adjusted R^2	0.21	0.21	0.21	0.21

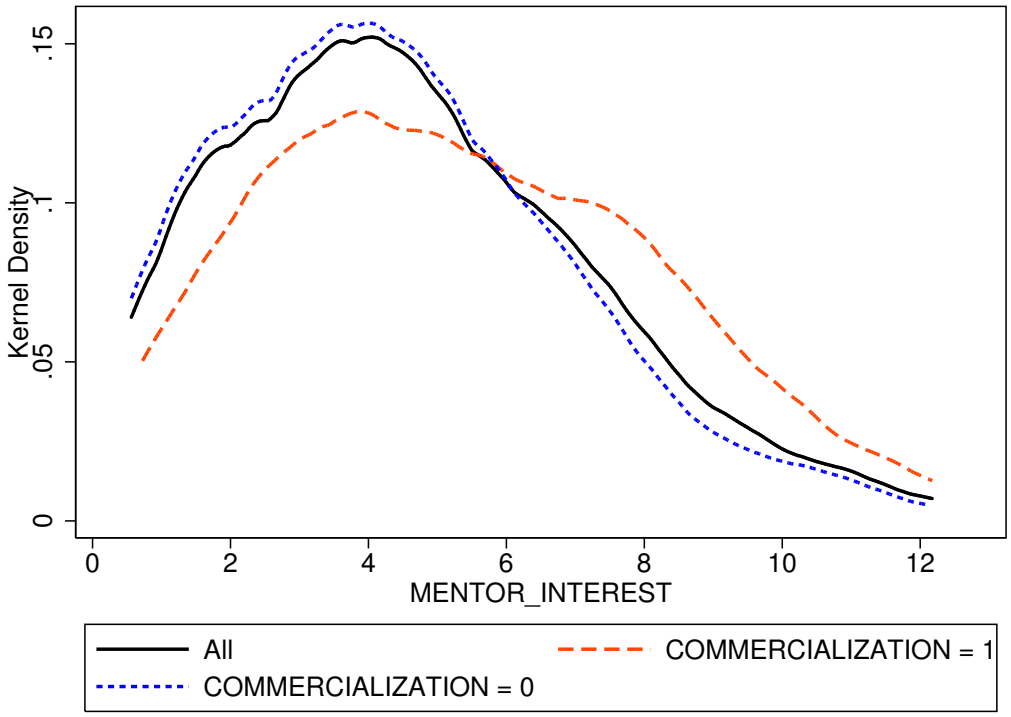
Notes: Coefficients estimated from Linear Probability Model. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. See Table 1 for variable definitions. All specifications include indicator variables for the values of MEETINGS, ENTRY_INCORP, AFFLI_STUDENT, AFFLI_ALUMNI, AFFLI_FACULTY, SECTOR_CP, SECTOR_CWM, SECTOR_ENGY, SECTOR_HW, SECTOR_SW, SECTOR_LSMD, and indicator variables for the values of START_YEAR.

Figure 1: Number of Ventures by Start Year at VMS



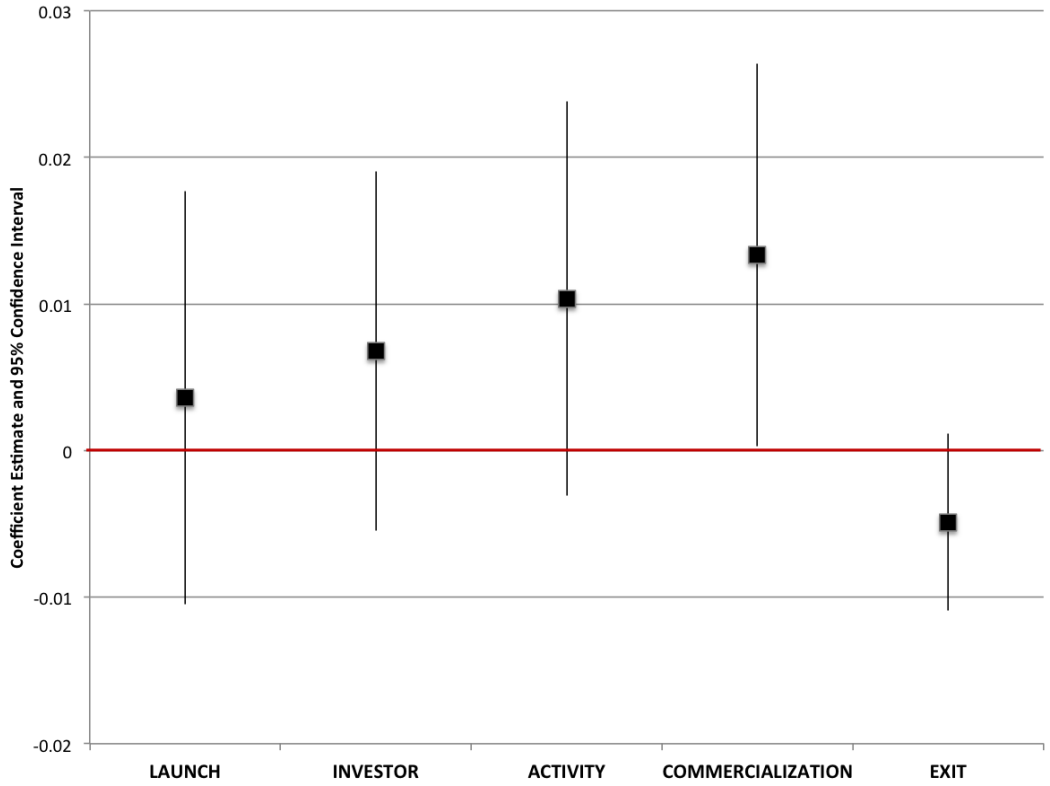
Notes: See Table 1 for variable definitions.

Figure 2: Distribution of Mentor Interest



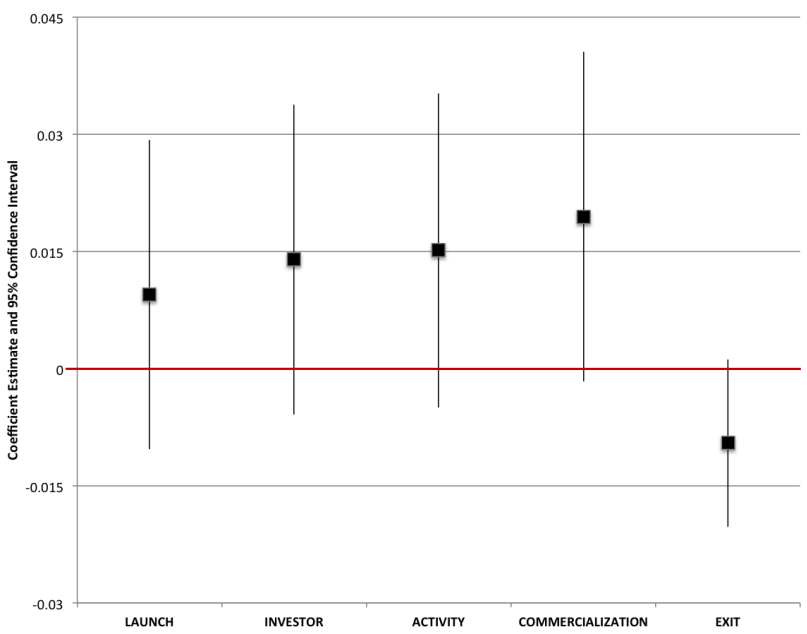
Notes: See Table 1 for variable definitions.

Figure 3: Estimated Relationships between Venture Outcomes and MENTOR_INTEREST

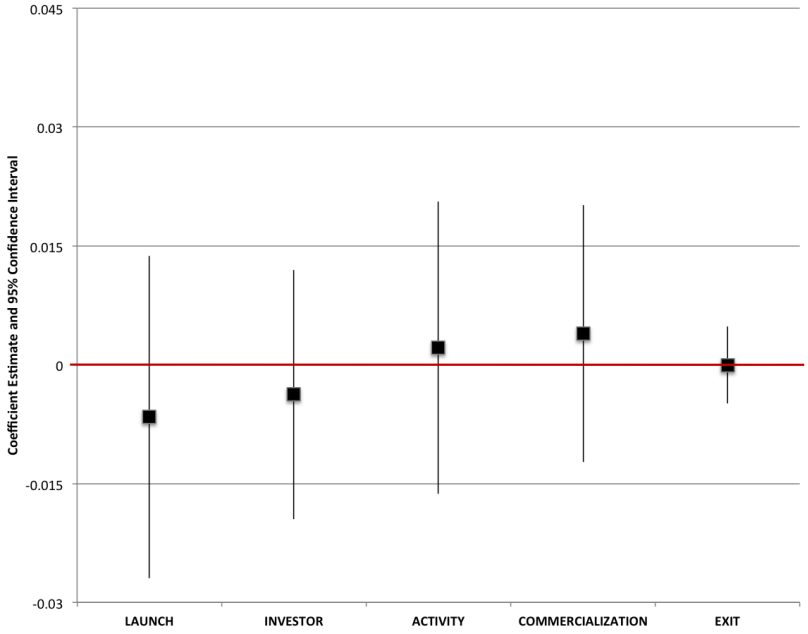


Notes: See Table 1 for variable definitions.

Figure 4: Estimated Relationships between Venture Outcomes and MENTOR_INTEREST by Technological Intensity



Technology-focused



Not Technology-focused

Notes: "Technology-focused" ventures include those with *ENTRY_IP = 1*, *RESEARCH_BASED = 1*, or *RD_SECTOR = 1.* Ventures that are not technology-focused have *ENTRY_IP = 0*, *RESEARCH_BASED = 0*, and *RD_SECTOR = 0.*

Appendix Tables and Figures

Table A.1: Anonymized Sample Venture Descriptions

VentureA – Grad Students. The company intends to deliver high-accuracy prediction for consumers of digital media. Potential customers would include retailers, hardware manufacturers and any firms that sell or distribute media. Founders are two grad students finishing their PhDs with expertise in machine learning, data mining, and language processing. They would like to determine if there is a business opportunity, if there is a viable business model and what it will take to launch a startup. They have passion and zeal. While they have shown their technology to work in the lab, this is early stage. The founders need to investigate questions concerning the IP.

VentureB – Faculty. This company makes blood from adult stem cells. This will help ensure a reliable global supply of safe, disease free blood. Currently, the blood supply is unpredictable because it is largely based on voluntary donations that can fluctuate. In low income countries donations are scarce and greater reliance is placed on family members and paid donors. The threat of contaminants and disease transmission is significant. The technology is early stage and has shown very promising results in the lab. The founder is seeking guidance on how to approach organizing a business, understanding the regulatory process, identifying customers and partners, and how to raise funding. There are questions that must be investigated concerning the IP and licensing.

VentureC - Student. This is a social entrepreneurship venture that will convert unused value on gift cards and stored-value cards into cash for charities. By going to the website, entering the card number, and stipulating the amount to give, cardholders can donate to the charity of their choice. The actual cash conversion is accomplished by VentureX debiting the card and liquidating the value (at a discount) on one of the well-established secondary markets. VentureC will take a percentage of the transaction, transfer the balance to the charity, and issue a tax receipt to the donor. In the future the service may extend its coverage to frequent flier miles and other readily convertible loyalty rewards. An alpha version of the site exists. The founders include a serial entrepreneur and a PhD student. They are seeking help on building their venture, advice on partnering with charities, and on fundraising.

VentureD - Students. The idea is to deliver individualized and relevant content to subscribers, customizing the content delivered according to each subscriber's interests and tastes. The service will feature a proprietary behavioral system which monitors user behavior and solicits user tagging and feedback to teach the system. VentureD also will offer tools for sharing interests among close friends to create an "addicting social network." Revenue will come from targeted advertising based on users' interests and demographics, and from partnerships with magazines and newspapers. Two student founders are doing the technical development. They have finalized the design and are currently building the prototype. They have come to VMS for practical advice on their business plan, getting to market, building a team, and obtaining funding.

Table A.2: Frequency of MNTR_INTEREST_COUNT

Num. Mentors Interested	Frequency	Percentage	Cumulative Percentage
1-2	95	14.5%	14.5%
3-4	132	20.2%	34.7%
5-7	204	31.1%	65.8%
8-11	161	24.6%	90.4%
12-14	39	5.9%	96.3%
15-20	24	3.7%	100%

Table A.3: Frequency of MEETINGS

Num. Mentors Interested	Frequency	Percentage	Cumulative Percentage
0	16	2.4%	2.4%
1-2	349	53.3%	55.7%
3-4	145	22.2%	77.9%
5-8	105	16.0%	93.9%
9-14	32	4.9%	98.8%
15-21	8	1.2%	100%

Table A.4: Estimated Relationship between COMMERCIALIZATION and Mentor Interest in Logit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MENTOR_INTEREST	0.019***	0.013**	0.012**	0.014**	0.014**	0.013**		
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)		
MENTOR_INTEREST							0.014**	
(Winsorized at 5%)							(0.006)	
MNTR_INTEREST_COUNT								0.010**
								(0.004)
INTERESTONLY_PERCENT								
ENTRY_IP		0.047	0.050	0.047	0.048	0.046	0.046	0.046
		(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
RESEARCH_BASED		0.037	0.050	0.080*	0.074*	0.070	0.070	0.070
		(0.044)	(0.044)	(0.044)	(0.045)	(0.044)	(0.044)	(0.044)
ENTRY_INCORP		0.218***	0.213***	0.209***	0.206***	0.216***	0.216***	0.214***
		(0.032)	(0.033)	(0.033)	(0.034)	(0.034)	(0.034)	(0.034)
MEETINGS					0.003			
					(0.005)			
Meeting Dummies	No	No	No	No	No	Yes	Yes	Yes
Sector Controls	No	No	No	Yes	Yes	Yes	Yes	Yes
Entrepreneur Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Start Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	655	655	655	655	655	655	655	655
Adjusted R^2	0.10	0.18	0.18	0.21	0.21	0.23	0.23	0.23

Notes: Marginal effects estimated from Logit regressions. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. See Table 1 for variable definitions. Meeting Dummies include indicator variables for all the values of MEETINGS (top-coded at 9 meetings). "Sector Controls" include SECTOR_CP, SECTOR_CWM, SECTOR_ENGY, SECTOR_HW, SECTOR_SW, and SECTOR_LSMD. "Entrepreneur Controls" include AFFLI_STUDENT, AFFLI_ALUMNI, AFFLI_FACULTY. "Start Year Dummies" include indicator variables for all the values of START_YEAR.