With a Little Help from My (Random) Friends:

Success and Failure in Post-Business School Entrepreneurship[*]

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PRELIMINARY

A central question in the entrepreneurship literature is how to encourage entrepreneurship and whether peers affect the decision to become an entrepreneur. We exploit the fact that Harvard Business School assigns students into sections, which have varying representation of former entrepreneurs. We find that the presence of entrepreneurial peers strongly predicts subsequent entrepreneurship rates of their peers who did not have an entrepreneurial background, but in a more complex way than the literature has previously suggested. A higher share of students with an entrepreneurial background in a given section leads to their peers to lower rather than higher subsequent rates of entrepreneurship. However, the decrease in entrepreneurship is entirely driven by a reduction in unsuccessful entrepreneurial ventures. The relationship between the shares of pre-HBS and successful post-HBS peer entrepreneurs is insignificantly positive. Sections with few prior entrepreneurs have a considerably higher variance in their rates of unsuccessful entrepreneurs. We argue that these results are consistent with intra-section learning, where the close ties between section-mates lead to insights about the merits of business plans.

I. Introduction

The promotion of entrepreneurship has been a major focus of policymakers in recent years (see Kanniainen and Keuschnigg [2004]). Thousands of national and local initiatives have been launched in the belief that entrepreneurial activity is associated with the creation of wealth, technological innovation, and increased social welfare. Consistent with this assertion, cross-national studies (e.g., Djankov, et al. [2002]) suggest that nations with greater barriers to entry of new firms also have poorer-functioning and more corrupt economies.

At the same time, entrepreneurship can have real costs. Individuals can be diverted from more productive careers into lucrative entrepreneurial ventures which may add little to the welfare of society as a whole (Baumol [1990]; Murphy, Shleifer, and Vishny [1991]). An emerging literature on "behavioral entrepreneurship" suggests that individuals may pursue new ventures even if the returns are predictably meager (Camerer and Lovallo [1990]; de Meza and Southey [1996]; Arabsheibani, et al. [2000]).

Thus, a core question in the study of entrepreneurship is what induces people to become entrepreneurs when projects can be forecasted to create value, on average, and what prevents people from entering into entrepreneurial ventures that are doomed to fail.

An area of particular recent interest has been the impact of peer effects. In many areas of economics, researchers have asked whether interactions among high-skilled individuals with similar interests lead to large social multipliers. In our context, the dramatic levels of entrepreneurship in regions such as Silicon Valley have led to speculation that powerful peer effects are at work in the decision to become entrepreneurs. Studies have shown that individuals who work at recently formed,

venture-backed firms are more likely to become entrepreneurs (Gompers, Lerner and Scharfstein [2005]), as are those who work at companies where colleagues become entrepreneurs (Nanda and Sorensen [2007]) and in regions where many others opt for entrepreneurship (Giannetti and Simonov [2007]). These papers suggest an unequivocally positive effect of "entrepreneurial environment" and "entrepreneurial peers."

While all these studies suggest that peer effects are important determinants of entrepreneurial activity, their inability to fully control for unobserved heterogeneity or sorting of individuals into firms and locations means our interpretation of these results must be cautious.

This paper explores peer effects in entrepreneurship in a particularly promising setting, the Masters of Business Administration (MBA) program at Harvard Business School (HBS). Unlike earlier work, we are able to exploit a truly random element when assessing peer effects: the assignment of MBAs by school administrators into sections, i.e., groups of 80 to 95 students who spend the entirety of their first year in the program studying and working together. These sections form extremely close ties, and are a setting where peer effects—if they are to be empirically observable at all—would be likely to be seen. We exploit the fact that the representation of students with entrepreneurial backgrounds varies considerably across sections to evaluate the impact of peers on the decision to become an entrepreneur, as well as on entrepreneurial success.

In addition to the appeal of the random assignment of students, this setting is attractive for other reasons. Many of the primary data sources most frequently used in entrepreneurship research, such as data compiled by the Bureau of the Census, the Internal Revenue Service, and in the Panel Study of Entrepreneurial Dynamics, have

substantial limitations in terms of the types of entrepreneurial activity that can be observed. As the recent literature review by Parker [2004] highlights, most empirical studies have focused on the choice to become self-employed (e.g., as a groundskeeper or consultant) rather than the founding of an entrepreneurial firm. In fact, in many databases, founders of entrepreneurial companies cannot be distinguished from employees of established firms. In this setting, we can focus on the founding of entrepreneurial firms, both in the classification of peers with entrepreneurial experience prior to entering Harvard Business School (pre-HBS entrepreneurs) and in the classification of graduates (post-HBS entrepreneurs)[1]

A second challenge facing much of the earlier empirical work is that the importance of entrepreneurial entities varies tremendously. While the bulk of entrepreneurial ventures simply replicate other entities and have a very limited growth potential, a small number of ventures create enormous wealth and have a profound economic impact. We are able to employ the extensive recordkeeping and research at Harvard Business School about its entrepreneurial alumni to assess the outcomes of these ventures. Historically, Harvard Business School students have been instrumental in founding leading firms in a variety of industries (e.g., the Blackstone Group, Bloomberg, LLP, and the modern Xerox Corporation; for many more examples, see Cruikshank [2005]). Even within our relatively recent sample, we encounter early-career HBS entrepreneurs founding highly successful firms, such as athenahealth (publicly traded,

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[1]The imprecision is particularly problematic in studies of professionals who may be unwilling to admit to being unemployed. In these cases, individuals tend to report themselves to instead be "self-employed consultants" or similar labels. By focusing on entrepreneurship by early-career professionals who are also highly sought after by consulting firms and investment banks, we avoid these issues.

with a market capitalization of $1.5 billion in November 2007) and SupplierMarket (acquired by Ariba for $581 million).

We find a striking pattern. When we look at the rate of post-HBS entrepreneurship across sections for students without an entrepreneurial background, we find that exposure to a higher share of peers with a pre-HBS entrepreneurial background leads to *lower* rates of entrepreneurship post-HBS, very much in contrast to the literature evaluating peer effects without randomization. In a number of specifications, a one standard deviation increase in the share of peers with pre-HBS entrepreneurial background in a section (evaluated at the mean of the various independent variables) drives the predicted share of the other students in a section going into an entrepreneurial role after graduation by 1.3%, or over twenty percent.

Our detailed data about the students' entrepreneurial ventures, however, also allows us to differentiate between successful and unsuccessful ventures. When we look one level deeper, we find that the negative peer effect is exclusively driven by a decrease in unsuccessful entrepreneurship. The share of students who start ventures that do not achieve critical scale or other measures of success is significantly and negatively related to the pre-HBS representation of entrepreneurs in a given section. Meanwhile, the relationship between successful post-HBS entrepreneurs and the share with previous entrepreneurial background is slightly positive, though not significant. The differences between the impact of prior entrepreneurs on the successful and unsuccessful post-HBS entrepreneurship rates are statistically significant. Finally, we show that sections with few prior entrepreneurs have a considerably higher variance in their rates of unsuccessful

entrepreneurs, beyond (mechanistic) increases in variance due to the increase in the probability of entrepreneurship.

These results are consistent with the presence of intra-section learning. The close ties between students in the same section lead to an enhanced understanding of proposed business ideas. Students seeking to start new ventures are able to benefit from the counsel of their peers. These benefits may come through different channels. One mechanism might be that peers with an entrepreneurial background help in identifying which initially promising ideas are problematic and thus not worth pursuing. This interpretation also explains the significantly higher variance of entrepreneurship rates and unsuccessful entrepreneurship rates when only one or two former entrepreneurs are present in the section (beyond the mechanistic changes in variance due to the difference in the probability to become entrepreneur). Students' assessments may be colored by the perspectives and experiences of the prior entrepreneurs (which may have been favorable or unfavorable); but, with a large enough number of entrepreneurial peers, at least one of them will have the expertise to detect the flaw in a given business idea. A related explanation is that the mere presence of entrepreneurial peers and their reports about their experiences help other students to realize the challenges involved in starting a company and, even without individual advice, discourage all but the best potential entrepreneurs from pursuing their venture. A third explanation is that the presence of entrepreneurial peers discourage students from pursuing entrepreneurial ventures in general, regardless of the success probability of the venture, and at the same time raise the quality of those ventures that are pursued nevertheless. Our analysis is consistent with all of these (closely related) interpretations.

In addition to helping understand peer effects in entrepreneurship, our analysis is relevant to policy-makers, business schools faculty and administrators.[2] Business schools are putting significant energy and resources into the promotion of these activities, often with public subsidies. For instance, during the 1990s and early 2000s, U.S. business schools created over 300 endowed chairs in entrepreneurship, typically paying salaries that were significantly higher than those in other business disciplines (Katz [2004]). Several hundred business plan contests for business school students were also launched during these years. The results of this paper suggest a slight redirection in educational and policy initiatives. Much of the benefit from exposure to entrepreneurship appears to come not from encouragement of more entrepreneurship but from help in weeding out ventures that are likely to fail. Rather than focusing on the attraction of more people into entrepreneurship, schools and policy-makers may want to ensure that only promising ventures receive funding or provide support to entrepreneurs in critically evaluating and identifying their most promising ideas.

The plan of this paper is as follows. In Section II, we review the relevant literature on the determinants of entrepreneurship. Section III describes the role of sections at Harvard Business School. We describe the construction of the sample in Section IV. Section V presents the analysis. The final section concludes the paper.

II. Peer Effects and the Determinants of Entrepreneurship

An extensive literature has examined the determinants of entrepreneurship. On the theoretical side, the choice to become entrepreneur has been attributed to differences in

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[2]To our knowledge, the only papers examining entrepreneurial choices among MBAs are Lazear [2005] and Eesley, Hsu and Roberts [2007], both with quite different focuses.

risk aversion (Khilstrom and Laffont [1978]), the skills engendered by diverse career experiences (Lazear [2005]), and differences in marginal tax rates (Kanbur [1981]). The literature has also highlighted barriers to entry into entrepreneurship, such as capital constraints (Evans and Jovanovic [1989]).

One area which is attracting increasing attention is the literature on the impact of behavioral biases on entrepreneurship. A suggestive finding in Evans and Leighton [1989] was that individuals with a greater "locus of control"—a belief that their performance depends largely on their actions—are more likely to become entrepreneurs. Bernardo and Welch [2001] present a model where the overconfident entrepreneurs can survive and contribute to overall welfare, even if they are more likely to make poor decisions than other entrepreneurs, who herd to decisions made by the group. Landier and Thesmar [2007] classify French entrepreneurs into optimists and pessimists based on their financing choices (e.g., the use of long- and short-term debt) and find that firms run by optimists tend to grow less, die sooner, and be less profitable, despite the fact that these owners tend to put in more effort.

The determinant we focus on is the role of peer effects, which have been attracting particular interest in the entrepreneurship literature. Previous studies have focused on the impact of working in an entrepreneurial environment, such as venture-backed firms (Gompers, Lerner and Scharfstein [2005]), companies where other colleagues become entrepreneurs (Nanda and Sorensen [2007]), and regions where many others opt for entrepreneurship (Giannetti and Simonov [2007]). The approach in these papers to measuring peer effects is to use observational data and to regress entrepreneurship outcomes on entrepreneurship among peers. There are several

difficulties in interpreting coefficients estimated with this approach (Manski [1993], Sacerdote [2001]). The most important issue is that individuals self-select into firms and locations. This makes it difficult to separate out the selection from actual peer effects. In fact, an extensive literature on peer effects in the economics of education shows that peer effects found in non-randomized settings tend to disappear once the analysis is redone exploiting true randomization (or vice versa), regardless of how extensively observables are controlled for in the non-randomized settings. Kremer and Levy [2003], for example, study the peer effects of college students who frequently consumed alcohol prior to college on the GPA of their roommates and find systematic differences in the sample of randomly assigned and the sample of self-selected roommates.

In this paper, we are able to move beyond the limitations of previous literature on peer effects in entrepreneurship by exploiting truly exogenous variation in the exposure to entrepreneurial peers. Our identification strategy is discussed in more detail in the next section.

Another confounding issue in the prior literature on entrepreneurial peer effects is the distinction between on the one hand the effect of one peer on others and common shocks affecting the entire peer group on the other hand. In the context of school outcomes, Sacerdote [2001] finds a significant correlation in the GPAs of randomly assigned college roommates but little evidence that students are affected by their roommate's pre-college academic background (SAT scores and high-school performance). Hence, as discussed in Kremer and Levy [2003], common shocks due to dorm room characteristics, infections, or joint class choices might be affecting both roommates and explain part of the results. Focusing on pre-determined characteristics,

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such as entrepreneurial activities prior to graduate school in this paper, avoids this problem.

Much of the literature on entrepreneurship has also been hampered by identifying a broad range of smaller and larger types of self-employment without distinction. In this paper we are able to distinguish between (ex post) good and bad decisions to become entrepreneur, by obtaining information about the scale and success of the entrepreneurial ventures. Hence, our paper provides not only a cleaner (and different) answer to the question whether exposure to entrepreneurial peers increases entrepreneurship, but also whether entrepreneurial peers help to make the "right" decision.

III.   Sections at Harvard Business School

Harvard Business School has long used a section system. Students spend their first year of the MBA program in a single classroom, taking a fixed slate of classes (e.g., accounting, finance, and marketing) with a set group of peers. While in their second year of the program, students take elective courses with the entire student body, the social ties established in the first year remain extremely strong. For instance, even at 25th reunions of HBS alumni, fundraising and many activities are arranged on a section-by-section basis.

The power of the social experience engendered by HBS sections has been observed upon in both journalistic accounts and academic studies. For instance, in his account of Harvard Business School life, Ewing [1990] observes:

> If the Harvard Business School has a secret power, it is the section system. A first-year section has a life of its own, bigger than any student, more powerful than any instructor… All first-year instructors I know agree

about the awesome power of the section. They may not like the way it works in all cases—who does—yet it drives B-school students to learn, influencing them in countless ways.

Similarly, in a field-based analysis of the first-year HBS experience, Orth [1963] highlights the extent to which students in sections, "in order to insure feelings of safety and, if possible competence in a situation that is initially perceived to them to be threatening," adopt "norms" that affect study patterns, social interactions, and even choices regarding employers with which to interview. He notes that "some norms appeared to be common to all first-year sections and others appeared to develop as a result of a particular section's pattern of adaptation to the conflicts and pressures of the first year."

Moreover, there is a considerable degree of diversity in terms of the backgrounds of the students across sections, which allows us to exploit the differences across sections empirically. Unlike other professional schools, HBS students have considerable professional experience prior to matriculation: in the classes under study, the median student had between three and five years of post-college work experience.[3]

Students are assigned into sections by school administrators whose assignment procedure is a mixture randomization and stratification. From conversations with the responsible administrators we learned that the primary considerations behind the stratification of students into sections appear to be:

- *The desire to achieve a diverse section experience.* School administrators attempt to ensure rough parity in the gender, race, ethnicity, and nationality of the students across sections.

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[3]http://www.hbs.edu/about/mba.html (accessed November 17, 2007) and unpublished tabulations.

- *The need to balance functional skills.* HBS relies on "participant-centered learning," where much of the analysis is driven by the students themselves, rather than the instructors. As a result, school administrators attempt to have a mixture of students with backgrounds in such disciplines as finance, manufacturing, and marketing—regardless of the specific context in which the students acquired these skills—in each section.

Hence, the primary dimensions along which students are sorted are also orthogonal to the ones of interest of our study. Secondary consideration in assigning students to sections are the scores students had on admission tests, the mixture of undergraduate institutions—e.g., Ivy League vs. state university graduates—and the specific regions where the students grew up, such as the Midwestern or Southern states. The latter dimensions are not completely orthogonal to the variable of interest. However, stratification along these dimensions does not bias our identification; it only lowers the power of our analysis. Interestingly, the School does not sort on whether the student had a background as an entrepreneur, because this information is not coded in the class-cards in a way that is readily sortable.

IV. The Data

Our analysis draws on three primary sets of data. These data sources characterize the sections in which the students spend their initial years, their career choices upon graduation, and the ultimate outcomes of the entrepreneurs' ventures respectively.

First, we collected data on the characteristics of each HBS section for the classes between 1997 and 2004. The starting date was dictated by data availability, the end date

by the need to have several years after HBS graduation in order to identify which entrepreneurs were successful.

The source of section information are student "class cards," which students prepare before matriculation (and may update while enrolled at HBS) to provide background information for other students and faculty. Information provided includes marital status, education, employment history, home region, and interests. From these cards, we determined a variety of information for nearly 6,000 HBS students:

- First, we determined gender, nationality (in particular, sole or joint U.S. citizenship), and family status. For the last item, we used their response to a query as to whether they had a partner, as well as whether they indicated children among their interests or other descriptive material.

- Second, we identified the industry where each student in the section had worked between the time of graduation from college and prior to entry into HBS. We coded the students who worked in multiple industries (e.g., investment banking and private equity) as having participated in both.[4]

- We characterized the educational background of the students in two ways. First, we identified primary degrees from Ivy League Schools. Second, we used "Ivy Plus" schools (an association of administrators of leading schools), which includes the Ivy League schools as well as the California Institute of Technology,

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[4]We employed a sixty-industry scheme employed by in the hiring and compensation database of Harvard Business School's Career Services (see description below). In an unreported analysis, we explore the robustness of the results to assigning students to a single field—the one in which he or she spent the most time (If a student worked an equal amount of time in two fields, we choose the area in which he or she worked most recently before beginning business school, as they are likely to have had more responsibility there.) The results are little changed.

the University of Chicago, Duke University, the Massachusetts Institute of Technology, Stanford University, and the Universities of Cambridge and Oxford. In unreported analyses, we also added to this the top non-U.S. schools (as defined by the *Times Higher Education Supplement*) in addition to Cambridge and Oxford: the Ecole Polytechnique and the London School of Economics. These changes make little difference to the results.

- We also attempted to characterize students risk attitudes, given some suggestive evidence in the entrepreneurship literature on lower risk-aversion of entrepreneurs (Parker [2004]). As an imperfect proxy, we characterized the riskiness of the activities listed by the students based on the injury data from American Sports Data [2005].[5] We employed their compilation of "Total Injuries ranked by Exposure Incidence," which gives the number of injuries per 1000 exposures for each sport. The most risky activity (boxing) causes 5.2 injuries per 1000 exposures and got a risk score of 1. Other activities were scaled accordingly. Lacrosse, for example, causes 2.9 injuries per 1,000 exposures and got a risk score of $2.9/5.2 = 0.558$, etc. We computed the top risk score for each student in

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[5]The data is based on a survey of 25,000 households in 2003, which obtained a 62% response rate. Several injury measures are provided, e.g. also injuries resulting in an emergency room visit, which tend to be quite correlated with the measure we employ. A number of the sports listed by the students are not included in the American Sports Data list. In these cases, we substituted the closest sport (e.g., baseball for cricket, day hiking for orienteering). For some activities we found no comparable listing by American Sports Data, some of which appear to be very high risk (e.g., motorcycle racing) and others more moderate (for instance, fencing). We assigned these the top and median risk rankings respectively. We excluded activities that did not involve physical exertion (e.g., fantasy football and pigeon racing) or entries were too vague to be classified (for instance, "athletics" or "all sports").

the section. In unreported robustness checks, we employed the average across all activities listed by the students in the sections.

- Finally, and most critically for our analysis, we identify students who have worked as a founder or co-founder of an entrepreneurial venture prior to entering Harvard Business School. These individuals were identified using key terms in the class cards such as "co-founded," "started", "launched," and so forth. Unlike the calculation of industry experience (which focused only on post-college graduation employment), we included businesses begun before graduating from college, on the ground that these experiences could also have led into valuable insights into the planning and implementation of entrepreneurial ventures.[6] We are also concerned that the impact of successful and unsuccessful entrepreneurs may be different. We thus characterized the businesses by whether the businesses launched prior to business school were successful or unsuccessful. (We determined this information through descriptions in the class-cards, social networking sites such as Facebook and LinkedIn, and direct contacts with the students.) Our primary cut-off point was whether the business achieved a million dollars in revenue. (In total, 42% of the businesses were classified as successful, 19% as unsuccessful and the remainder as unknown.[7]

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[6]Starting up and heading a division within a company was not counted as entrepreneurship. Freelance consulting was not counted as starting a business unless there are other consultants working for that person. We also did not include a small number of cases where students operated franchises as entrepreneurs since operating a franchise is more similar to running a corporate unit.

[7]Note we used a lower cut-off than defining the success of post-business school entrepreneurship. This reflected our belief that students engaging in pre-business school entrepreneurship had a lower opportunity cost, so a lower hurdle should be applied.

We also wished to characterize the opportunity set that students considering entrepreneurial ventures faced. One approach, which we employ in many regressions, is to simply use year dummies. In other specifications, we used several measures of the overall U.S. economic environment for entrepreneurs. The first of these is the total amount of venture capital financing disbursed by year. Venture capital is an important mechanism for funding new growth firms. Many of the new ventures begun by Harvard MBAs have been funded by these intermediates. We compile the amount provided annually both in all financing rounds and (in unreported analyses) in initial financings in the United States.[8] We also compiled from Securities Data Company and the web-site of Jay Ritter the number and dollar volume of initial public offerings in United States, as well as the amount "left on the table" in these offerings (the difference between the closing price on the first day and the offer price, multiplied by the number of shares sold[9]). We only use one of these measures in the reported analyses; the results are robust to the use of alternatives.[10]

A major difficulty in the data collection process was posed by the failure of HBS to archive class cards prior to 2000. For the period between 1997 and 1999, we obtained the class cards from HBS professors who had saved the class cards of their former

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[8]Venture capitalists typically finance firms in multiple rounds. In certain time periods, they appear to emphasize more funding new companies, in other times the refinancing of firms already in their portfolio. The information is taken from National Venture Capital Association [2005], based on the records of Venture Economics.

[9]This is the wealth transfer from the shareholders of the issuing firm to the investors who were allocated shares at the offer price (Loughran and Ritter [2002]).

[10]Even though IPOs are typically confined to firms that have several yeas of operations, they provide a useful measure of venture capital financing available to new ventures in the same industry, possibly reflecting attractive investment opportunities in this industry (Gompers, Kovner, Lerner, and Scharfstein [2007]).

students. Some of these instructors had taught first-years classes, in which case they had information on all the students in a given section. Others had taught second-year classes, in which they had cards on an assortment of students across various sections. As a result, the completeness of our information about sections in the early years (and the precision with which we can characterize the features of sections) varies.

Table I presents the basic characteristics of the MBA classes. Unlike elsewhere in the paper, here we show aggregate data on the entire student body from the HBS administration, which includes those students for whom we are missing class-card. While the MBA class size remained constant during this period, the composition changed: female, minority and non-U.S. students were increasingly represented. In addition, the share of students with technical training increased markedly. The average section size remained relatively constant from the class of 1998, when an additional section was added in conjunction with an experimental accelerated MBA program, until the class of 2004, when the number of sections was reduced from 11 to 10 shortly after the elimination of the program. The lower half of Table I shows the measures of financing activity. The year-by-year highlights the acceleration of activity during the "bubble years" of the late 1990s. This pattern is also illustrated in Figure 1.

Table II shows the distribution of student characteristics by section. We present the results for all 86 sections, and then for the 60 sections where we were able to gather at least sixty class cards, and thus can characterize the distribution of students with greater confidence. On average, 5% of each section has worked previously as an entrepreneur, though the range is between one and ten percent. The heavy representation of students in investment banking and consulting is also apparent. We also report the share of students

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working in private equity (which we define here to include both venture capital and buyout funds), since these students may be particularly well prepared to provide counsel to would-be entrepreneurs.

Sections differ sharply on a variety of personal characteristics, including the presence of students with children and graduates of elite schools. The differences across sections narrow somewhat when we require that we have data on at least 60 students, which reflects the fact that the characteristics of the section are less noisy when we have a larger number of class cards.

The second source of information related to the choice of careers post-graduation. HBS conducts each year an "exit survey" of each graduating class.[11] The school has made the picking of a cap and gown for graduation conditional on completion of the survey, which ensures a very high participation rate. The survey includes multiple choice categories (i.e., for industry of employment) as well as whether the firm is an established firm or a new venture the student is founding.[12]

Finally, we compute the number of successful firms established by students in each section while at HBS or within one year of graduation. We determine success as of October 2007. Though it is hard to find any objective threshold criterion and any systematic definition of success is sure to have its arbitrary elements, for the bulk of the

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[11]This survey does not, of course, characterize the career choices those students who drop out without completing a degree. Only a small fraction of each class (typically considerably under 1%) does not complete their degree, and these overwhelmingly represent students who are separated involuntarily due to poor academic performance. Even at the peak of the Internet boom, only a handful of students permanently left school before graduation to pursue an entrepreneurial opportunity.

[12]It should be noted that the survey only reflects student's intentions at the time of graduation: some would-be entrepreneurs may abandon their quests if they get an attractive offer thereafter.

paper we define a successful business as one that (a) went public, (b) was acquired for greater than $5 million, or (c) had in October 2007 or at the time of the sale of the company at least 50 employees or $5 million in annual revenues. Only 13% of the post-HBS MBA entrepreneurs were successful using these criteria. In supplemental analyses, we employ a higher hurdle, defining a successful firms as one that that (a) went public, (b) was acquired for greater than $100 million, or (c) had in October 2007 or at the time of the sale of the company at least $100 million in revenues.

We determine this information from three sources. First, the HBS External Relations (Development) Office has undertaken extensive research into its entrepreneurial alumni. This research process intensified in 2006 and 2007, in anticipation of a planned 2008 conference in honor of the institution's 100th anniversary that was intended to bring together its most successful and/or influential entrepreneurial alumni.

Second, the School conducted an on-line survey of entrepreneurial HBS alumni who had been in the 1997 through 2004 classes. This survey, organized by Michael Roberts, executive director of the Rock Center for Entrepreneurship, sought to capture information about all those who participated in the School's business plan contest,[13] as well as others known to have undertaken early-career entrepreneurial ventures. The survey used a "viral" approach, whereby known entrepreneurs were asked to identify other entrepreneurs among their classmates, and encourage them to complete the survey.

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[13]The contest for students in the second (and final) year of the MBA program was first initiated in 1997. The individuals were initially contacted via e-mail in January 2005. Non-respondents were contacted three times via e-mail and telephone. Overall, 41% of all contacted students participated. This rate is consistent with or above the level of responses typical in social science studies of this cohort (Barch [1999]).

Finally, we conducted interviews with the faculty in the HBS Entrepreneurship Unit. These faculty members are often intimately involved with alumni ventures, whether as sponsors of the independent studies where the initial business plans are drawn up or as directors, advisory board members, or investors in subsequently established ventures. Even in cases where the faculty members have no formal role going forward, they often stay in touch with alumni entrepreneurs. As a result, they have extensive knowledge about the performance of these ventures.[14]

Figure 2 summarizes some key patterns in regard to HBS early-career entrepreneurship. The top panel presents the extent to which pre-HBS entrepreneurship rates vary across section, even after adjusted for year. In particular, it presents the distribution of the normalized entrepreneurship rate: the share of students with entrepreneurial experience prior to entering HBS in each of the 86 sections divided by the average rate in that year. While some sections have no members with previous entrepreneurial ventures, others have a rate nearly three times the others in that year.

The lower panel highlights the extent to which the rate of post-HBS entrepreneurship varies over time. The peak in entrepreneurial entry around 2000, when more than ten percent of the class began entrepreneurial ventures upon graduating, is very evident. Several observations can be made about pattern of successful entrepreneurship. First, though we are using the first, less demanding definition of successful entrepreneurship, only a very small share of the entrepreneurial ventures were successful.

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[14]In some cases, we were unable to determine from our sources the exact specifics regarding revenues or acquisition process private firms. In these cases, we consulted a wide variety of business databases, such as CorpTech, EDGAR, Factiva, and Orbis. We also undertook direct contacts with the entrepreneurs to obtain this information on a confidential basis.

There is a less pronounced temporal pattern here, but the years that saw the greatest number of successful entrepreneurs was earlier (suggesting that less suited students may have been drawn into entrepreneurship by their predecessors' success).

The final element of the data preparation had to do with determining the share of students who did not have an entrepreneurial background who became entrepreneurs. The placement data is compiled and reported on a section level, which means we cannot use it directly. To create the desired ratio, we researched each of the students who had an entrepreneurial background to determine if they took an entrepreneurial position after HBS, using social networking sites, Google searches, and direct contacts. Our primary measure was constructed as follows:

$$\frac{\text{\# of Post-HBS Entrepreneurs - \# of Pre and Post Entrepreneurs}}{\text{Section size* (1 – Pre-HBS Entrepreneurship Rate)}}$$

One difficulty was that in some cases we did not have all the class-cards, or could not determine with certainty whether the student became an entrepreneur. We also repeated the analysis in a robustness check, assuming that as set percentage of the students who were entrepreneurs prior to HBS also chose this career upon graduation (30% in the reported results, a rate based on data from the Rock Center survey, though we also used other rates and found they had little impact).

V. Empirical Analysis

Our analysis proceeds in several steps. First, we test for determinants of the overall rate of HBS graduates in each section becoming entrepreneurs. Then we turn to understanding the determinant of successful and unsuccessful entrepreneurs. Finally, we examine the variance of success rates across sections.

A. Test of Randomization

We initially conduct a test of whether the distribution of entrepreneurs across sections is truly random. If the students are not randomly distributed, as we argued above, our empirical strategy in the analysis would pose concerns.

These results are presented in Table III. When we compare sections that have below and above the median number of entrepreneurs in Panel A, only one set of differences are significant at the five percent confidence level: sections with more entrepreneurs are less likely to have students who attended elite schools. (We will control for this in supplemental regressions.) When we seek to explain the number of pre-HBS entrepreneurs in Panel B, the explanatory variables are jointly insignificant. These results help assure us that the distribution is random.

B. Univariate Comparisons

We begin by analyzing the basic relationship between the representation of students with previous entrepreneurial experience in a given section and the rates of total and successful post-HBS entrepreneurship.

First, we simply review the patterns graphically. Figure 3 looks at the relationship suggests the normalized share of entrepreneurs in the section prior to graduation and the share of total and successful post-HBS entrepreneurs. The top panel suggests that sections with more prior entrepreneurs have considerable less variation in the share of entrepreneurs after graduation. The sections with few earlier entrepreneurs have either

very high or very low levels of post-HBS entrepreneurship, and have on average higher rates.

The lower panel looks only at the share of successful post-HBS entrepreneurs. Here the pattern is much more ambiguous, with the exception of one section with a number of successful entrepreneurs and a high normalized pre-HBS entrepreneurship rate. Certainly, no sign of the negative relationship identified in the top panel appears here.

Table IV examines correlation coefficients between various characteristics of the sections and the share of students becoming entrepreneurs post-HBS. We present the results for all sections and for those where we have at least 60 class cards. The results restricting the sample to those sections with at least 60 responses are consistently more significant, reflecting our ability to better characterize section characteristics. In that analysis, we see that those sections which had relatively more male, single, and U.S. citizen students were more likely to have higher rates of entrepreneurship. Both venture capital funding and IPO activity in the year of graduation are correlated with post-HBS entrepreneurship. There is a negative relationship between the share of students who were entrepreneurs prior to business school and those beginning ventures after HBS, but it is only significant at the ten percent confidence level.

The correlations with successful entrepreneurship are much weaker. The only significant correlate—just at the ten percent confidence level—is the amount of venture funding in the graduation year. The relationship between the normalized share of pre-HBS entrepreneurs and the share of the section becoming successful entrepreneurs is positive but insignificant.

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These patterns are, of course, simply suggestive: we will want to control for a number of features of the sections simultaneously. Nonetheless, they are indicative of the patterns we will see throughout the paper.

C. Regression Analyses

We now turn to analyzing the determinant of post-HBS entrepreneurial in a more systematic manner. We estimate ordinary least square regressions where the unit of observation is each section in the classes of 1997 through 2004. The share of the section becoming entrepreneurs (either overall, or divided into successful and unsuccessful shares) is the dependent variable.

Table V presents the analysis of the propensity of students who are not entrepreneurs prior to HBS to become entrepreneurs. We employ a variety of specifications. We run the analysis using all sections (weighted by the number of observations), then restricting the sample to sections with at least forty and then at least sixty class cards. We also use the two methods of correcting the aggregate entrepreneurship rate described at the end of section IV: the first three regressions subtract out the number of pre- and post-HBS entrepreneurs, while the last three employ the average post-HBS entrepreneurship rate for pre-HBS entrepreneurs. We find several patterns consistently across the regressions:

- The coefficient on the share of the section with an entrepreneurial background is always negative. As we limit the sample size to those where section characteristics can be better measured (i.e., those with 40 or more responses), this coefficient is consistently significant at the one-percent confidence level.

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- The coefficient on the share of the section that is male is always positive. As we restrict the sample size, this variable is consistently statistically significant.

- The share of the section that has a partner is always negatively and significantly associated with the post-HBS entrepreneurship rate.

- Entrepreneurial activity is associated with periods of more venture activity. When we employ class dummies, those for 1999 and 2000 have the greatest magnitude and significance. When we employ the venture and IPO dummies, the measure of the level of venture activity in the year of graduation is consistently positive and significant at the one percent level.

- The goodness of fit increases markedly as we restrict the sample size, reflecting the greater precision with which we can measure the characteristics of the sections.

- The coefficient on the mean risk tolerance of the section is insignificant. This may, however, simply reflect the poor quality of the proxy we employ.

The basic pattern is consistent with our hypotheses delineated above.

The results are not just statistically significant, but economically meaningful. In the third regression, a one standard deviation in the normalized pre-HBS entrepreneurship rate (=*exp(-0.415*0.031)*) translates into a 1.3 percent decrease in the predicted rate of entrepreneurship after business school. Other regressions are similar in magnitude. These changes are significant relative to the mean rate of post-HBS entrepreneurship, which averages a little under five percent.

We then examine the rates of successful and unsuccessful post-HBS entrepreneurship. We defined the rate of unsuccessful entrepreneurship in each section as

the difference between the total rate of entrepreneurship and the successful entrepreneurship rate.[15]

Table VI presents regressions with the same set of specifications as in the previous table, with the share of successful entrepreneurs who were not previously entrepreneurs as the dependent variable in Panel A, and that of unsuccessful entrepreneurs in Panel B. The representation of successful entrepreneurs is much more difficult to predict: the goodness of fit is considerably lower and does not increase consistently as the sample size is restricted and the section variables measured more precisely. The coefficient on the share of the section that was an entrepreneur prior to HBS is always positive, but never statistically significant in the first set of regressions. It is significant in the second set of regressions. Nor are the other variables that are important in the Table V regressions significant. The appearance of successful entrepreneurs seems driven by other unidentified features, perhaps relating to the entrepreneurial talent of individual section members.

The results of regressions explaining unsuccessful entrepreneurship, by way of contrast, are very similar to those on Table V. Of particular note, once we restrict the sample size to the sections whose features can be more precisely measured, the share of the section with an entrepreneurial background pre-HBS is significantly negatively associated with unsuccessful entrepreneurship after HBS.

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[15]While we believe that we identified a virtually comprehensive list of successful HBS entrepreneurs from the classes in our sample, a similar approach would not have worked for unsuccessful entrepreneurs. Unsuccessful ventures are frequently much less visible, and participants may not be willing to disclose them (e.g., in response to a survey request) after the failure.

In unreported analyses, we formally test whether the coefficients on the variable measuring the entrepreneurial background of the section is the same in the successful and unsuccessful regressions. We do this by estimating a pooled regression and then performing an F-test of the null hypothesis that the coefficient on this variable is not different. The null hypothesis of no difference is always rejected at least at the five percent confidence level.

Thus, the presence of peers who have had entrepreneurial experience tend to deter peer from undertaking unsuccessful ventures, but does not have this effect on those who will launch successful ventures. Indeed, entrepreneurial peers may even have a slightly positive effect on would be successful entrepreneurs.

One possible interpretation of this finding is that pre-HBS entrepreneurs tend to be "bad" entrepreneurs, whose previous failures dampen the general enthusiasm about entrepreneurship among their peers. Empirically, however, that does not seem to be the case. Many of the pre-HBS entrepreneurs have been extremely successful, having sold companies for tens of millions of dollars.

C. Robustness Checks

We then undertook a series of robustness checks of the results. This section describes the reported and unreported analyses we did.

One concern was potential limitations of our success measure. For example, our primary measure of success includes firms such as Guru.com, an online marketplace for freelance talent that was sold for approximately $5 million to rival Unicru in 2002. Whether any of the key parties associated with the firm regarded this as a success is

doubtful, given that Guru.com raised over $62 million in venture capital financing in 1999 and 2000.[16]

In the first two columns of Table VII, we repeat the analysis in the fifth column of Table VI, now using the higher, $100 million cutoff defined above. The results continue to resemble those above, as they did when we re-estimate a number of the other regressions reported in Table VI. The coefficients on the share of the section with an entrepreneurial background in the two reported regressions are significantly different at the one percent confidence level.

A second concern relates to unobserved differences in the quality of the students in sections. One possibility is that students with entrepreneurial backgrounds were admitted more because of their interesting prior experience rather than their academic abilities, and that sections with many entrepreneurs are somehow less talented as a result. To address this possibility, we sought to use a measure of academic achievement prior to HBS, rather than one from the time the students were in school. We worried that students pursuing a new venture at HBS might have neglected their classes, while those pursuing careers in consulting, for instance, may have found the certification associated with academic honors more valuable. In the reported results, we use the share of the section that attended an "Ivy Plus" institution.

In the third and fourth regressions in Table VII, we re-estimate the regression in the fifth column of Table VI with this additional control. The results are again little changed, and the entrepreneurial background coefficients are significantly different at the

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[16]The information on Guru.com was obtained from http://www.venturexpert.com (accessed November 17, 2007), Factiva, and other on-line sources.

five percent confidence interval. These results continue to hold when we use the broader and narrower designations of elite schools defined above.

Another concern relates to our econometric specification. In particular, we are concerned about censoring given that, in many cases, the number of successful entrepreneurs in a given section is zero. We reran the analysis using a Tobit specification. Unfortunately, we could not employ year dummy variables in these regressions, as the estimates did not converge when we included them. The coefficients continued to be qualitatively similar. The results are presented in the fifth and sixth columns in Table VII.

D. Variance in Entrepreneurship Rates

The final analysis examines not the mean rate of entrepreneurship, but rather its variance. As hypothesized above, sections with fewer students with an entrepreneurial background are likely to display a greater variance in their post-HBS entrepreneurship rates, particularly in the share of unsuccessful entrepreneurs.

Table VIII displays the results of the analysis. We divide the sections by the unadjusted share of entrepreneurs into the section: we assume that the hypothesized effect occurs whenever there are few entrepreneurs, regardless of whether the section is particularly poorly represented in this regard relative to the other sections. The table reports the variance in the rate of overall, successful, and unsuccessful entrepreneurship for sections that are above and below the median on this measure. Following our approach above, we repeat the analysis for all sections and for those with at least 40 and 60 class cards.

We find that sections with more entrepreneurs have less variance in the overall entrepreneurship rate. This pattern is entirely driven by the unsuccessful entrepreneurs: the variance in the unsuccessful post-HBS entrepreneurship rate is nearly twice as great in sections with below the median numbers of prior entrepreneurs than those with above the median.

One reason for the reduction in variance in section with above-median number of entrepreneurs is a mechanical relationship. A natural statistical model of the number of students who become entrepreneurs is a binomial distribution. For a distribution with N independent observations, which may take on values of 1 with probability p and 0 otherwise, the variance is equal to $(p - p^2)N$. In this case, the reduction in variance associated with the sections with high rates of pre-HBS entrepreneurship will be partially due to the lower probability of post-HBS entrepreneurship and hence lower variance. This point can be illustrated by the following simplifying calculation: Moving from the 75th to the 25th percentile for a normally distributed variable is associated with a reduction by 1.35 standard deviations. Evaluated at the mean of the independent variables, this translates into a reduction in variance by 32%. Thus, a significant part of the observed 44% decline in variance of the total rate of entrepreneurship, going from sections with below-median to sections with above-median pre-HBS entrepreneurship, may be due to this mechanical relationship.

At least the remaining variance reduction, however, might be explained as described above: the feedback from pre-HBS entrepreneurs are likely to be colored by their personal experience; however, with a large enough number of entrepreneurs present, one of them will be critical and experienced enough to detect the "flaw" in a business

plan. Somewhat more puzzling is the fact that the variance of the successful entrepreneurship rate actually increases when there are more entrepreneurs in the section. We do not have a ready explanation for this pattern. We note, however, that the magnitude and the significance of the difference declines as we are more restrictive in terms of the sample size.

VI.   Conclusions

This paper studies a topic of increasing scholarly and practical interest, the impact of peer effects on the decision to become an entrepreneur. We examine the decision to undertake entrepreneurial activities among recent graduates of the HBS MBA Program. This setting is an attractive one for a study of these issues due to the random assignment of students to sections, the ability to distinguish the establishment of truly entrepreneurial firms (as opposed to self-employment), and the potentially high economic impact of these ventures.

We find that a higher share of students in a given section with an entrepreneurial background leads to lower rates of entrepreneurship post-HBS. This effect is driven by the rate of unsuccessful entrepreneurs: students in sections with more pre-HBS entrepreneurs are less likely to start unsuccessful ventures. The relationship between successful post-HBS entrepreneurs and the share with previous entrepreneurial background is considerably weaker, but appears to be slightly positive. Finally, sections with few prior entrepreneurs have a considerably higher variance in their rates of unsuccessful post-HBS entrepreneurship. We argue that these results are consistent with

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intra-section learning, where the close ties between students in a section lead to an enhanced understanding of the merits of proposed business ideas.

We highlight two avenues for future research. This paper suggests a richer role for peer effects than what has been described in much of the literature. Most of the empirical studies of peer effects in entrepreneurship, for instance, have implicitly assumed a "contagion effect," where the decision of one individual to begin a firm leads others to do so likewise. This analysis suggests a richer set of dynamics are at work. Understanding how these effects work in more detail would be very worthwhile.

A second avenue for future research is exploiting the randomness of section assignments at HBS to look at other phenomena. The differing educational, national, religious, and experiential mixtures of the various sections should make this a fertile testing ground for a variety of economic theories about network and peer effects.

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Figure 1: Macroeconomic Conditions over Time

VC Financing 1997-2004

Legend:
- First-round VC Financing ($MM)
- Total VC Financing ($MM)

X-axis: Class of '97, Class of '98, Class of '99, Class of '00, Class of '01, Class of '02, Class of '03, Class of '04

Y-axis: 0 to 120,000

IPO Financing 1997-2004

Legend:
- Aggregate IPO Sum Left-on-Table ($B)"
- Aggregate IPO Proceeds ($B)

X-axis: Class of '97, Class of '98, Class of '99, Class of '00, Class of '01, Class of '02, Class of '03, Class of '04

Y-axis: 0 to 70

Figure 2: Variation in Entrepreneurial Activity by Class and Section

Figure 2.a: Pre-HBS Entrepreneurship

Distribution of Pre-HBS Entrepreneurs, by Section

Distribution of Normalized Pre-HBS Entrepreneurship, by Section
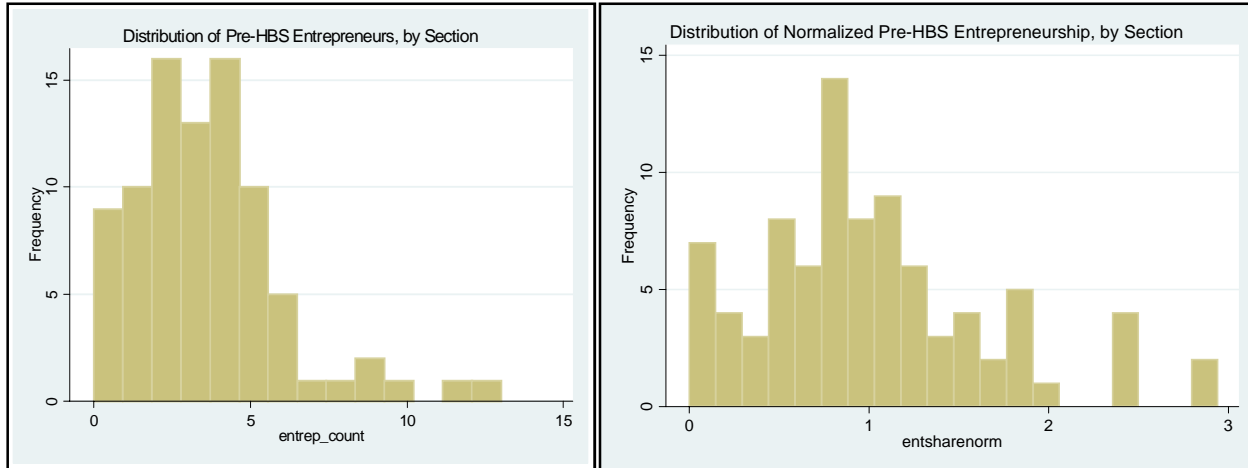
Notes. The left graph shows the distribution of the number of students with entrepreneurship experience prior to entering HBS over the 86 sample sections. The right graph shows the number of entrepreneurs normalized by the number of classcards available for the section, divided by the average rate in the same year across sections.

Figure 2.b: Post-HBS Entrepreneurship

Post-HBS Entrepreneurship by Class

- Share of Post-HBS Entrepreneurs
- Share of Successful Post-HBS Entrepreneurs
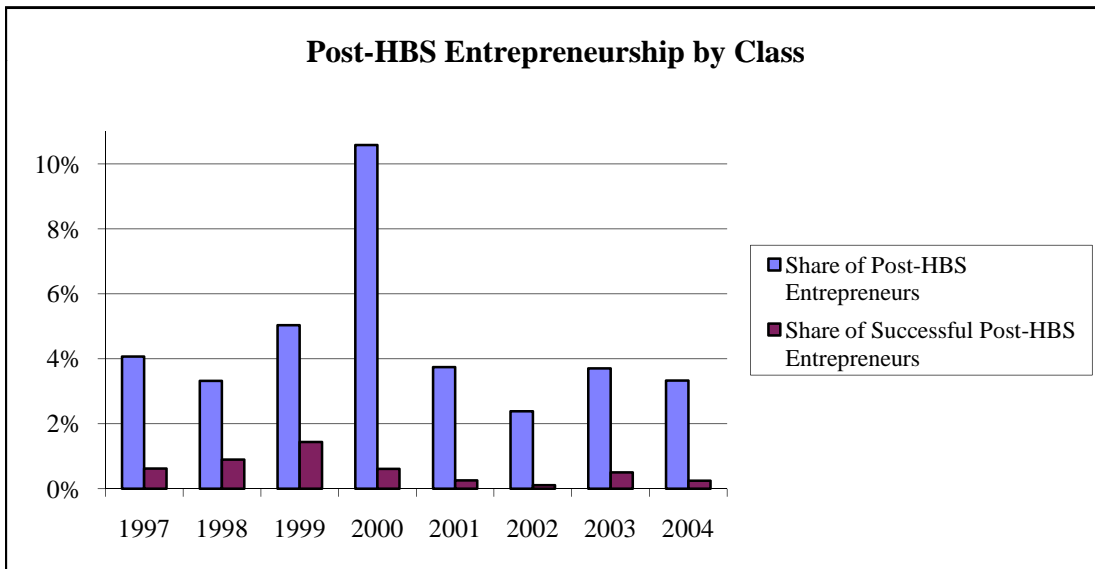
Figure 3: Relationship between Pre- and Post-HBS Entrepreneurship, by Section

Relationship between Pre- and Post-HBS Entrepreneurship, by Section

Relationship between Pre- and Successful Post-HBS Entrepreneurship, by Section
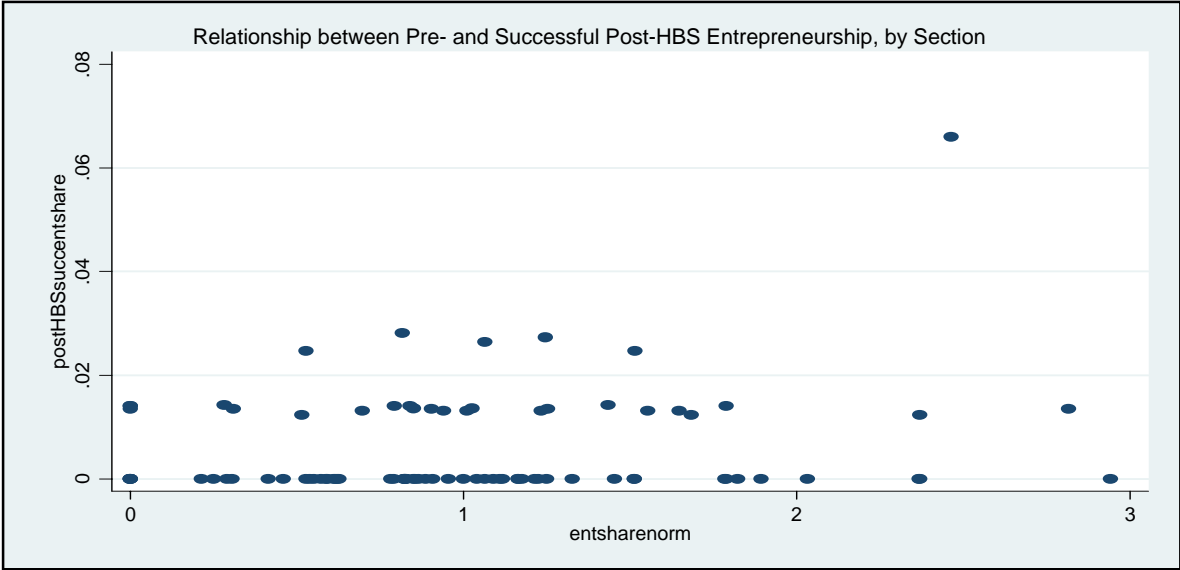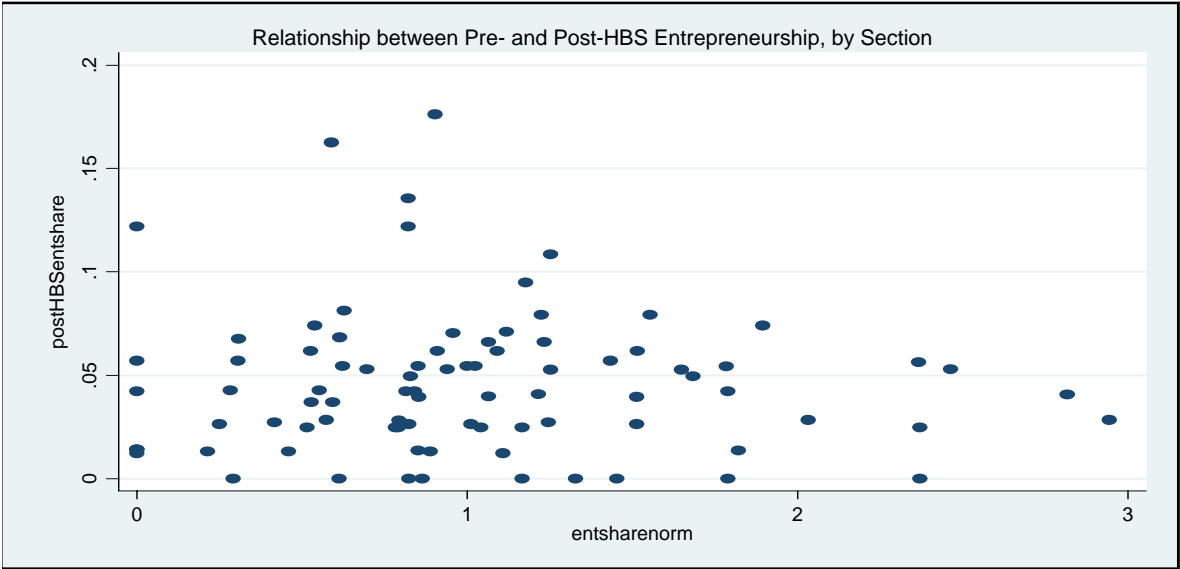
Table I: Background Variables

	Class of '97	Class of '98	Class of '99	Class of '00	Class of '01	Class of '02	Class of '03	Class of '04
MBA Enrollment	898	913	903	880	865	917	898	898
MBA Applications	6973	8053	7496	8061	8476	8124	8893	10382
Profile								
Female	27%	24%	29%	30%	31%	33%	36%	35%
Minorities	19%	18%	18%	19%	18%	20%	21%	25%
International	24%	25%	26%	26%	35%	32%	33%	32%
Undergraduate Majors								
Humanities & Social Science	50%	46%	47%	42%	41%	41%	45%	40%
Engineering & Sciences	22%	26%	29%	34%	31%	31%	30%	32%
Business Administration	24%	25%	20%	21%	24%	24%	20%	20%
Other	5%	3%	4%	3%	4%	4%	5%	8%
Average Section Size	90	83	82	80	79	83	82	90
IPOs in Graduation Year								
Number of IPOs	432	267	457	346	76	67	62	179
Aggregate Proceeds ($B)	29	32	63	61	34	22	10	32
Aggregate Sum Left-on-Table ($B)	4	5	36	27	3	1	1	4
Venture Financing in Graduation Year								
First-Round Financing ($MM)	4,844	7,199	16,201	28,979	7,512	4,452	3,577	4,438
Total Financing ($MM)	14,897	21,270	54,480	105,832	40,943	21,615	18,924	20,993

Table II: Section Characteristics

Panel A: Full Sample of all 86 Sections (Classes of 1997-2004)

	Mean	Median	St. Dev.	10th Percentile	90th Percentile
Share that Worked as an Entrepreneur	5.4%	4.9%	3.6%	1.2%	10.3%
… in Consulting	22.5%	22.9%	5.4%	16.0%	28.4%
… in Investment Banking	18.7%	18.6%	5.5%	12.8%	25.0%
… in Private Equity	4.6%	4.0%	3.0%	1.1%	8.6%
Share of Section that is Male	70.2%	68.5%	7.0%	63.9%	82.5%
… Has USA Citizenship	66.6%	65.9%	6.5%	58.2%	75.9%
… Has Children	5.1%	4.9%	3.3%	1.3%	9.7%
… Has a Partner	41.5%	42.0%	7.7%	31.7%	50.7%
Average Maximum Risk Score	38.6%	39.0%	3.1%	34.4%	42.2%
Share of Section Having Attended an Ivy League Co	24.2%	24.1%	5.5%	18.1%	31.8%
Share of Section Having Attended an Ivy Plus Colle	34.4%	34.4%	6.5%	25.3%	42.7%

Panel B: Subsample of 60 Sections with at Least 60 Responses (Classes of 1997-2004)

	Mean	Median	St. Dev.	10th Percentile	90th Percentile
Share that Worked pre-HBS as an Entrepreneur	5.0%	4.8%	3.1%	1.3%	9.3%
… in Consulting	24.0%	23.6%	4.1%	19.5%	28.3%
… in Investment Banking	18.3%	18.4%	3.7%	13.5%	23.0%
… in Private Equity	5.1%	4.3%	3.1%	1.3%	9.4%
Share of Section that is Male	67.2%	67.3%	3.1%	63.5%	71.0%
… Has USA Citizenship	64.9%	64.7%	5.4%	58.2%	72.6%
… Has Children	4.7%	4.4%	3.0%	1.3%	9.1%
… Has a Partner	42.7%	43.3%	7.3%	33.3%	51.3%
Average Maximum Risk Score	38.9%	39.6%	2.7%	35.4%	42.0%
Share of Section Having Attended an Ivy League Co	24.0%	24.1%	4.1%	19.4%	29.1%
Share of Section Having Attended an Ivy Plus Colle	34.7%	34.3%	5.5%	27.4%	42.2%

Table III. Test of Randomization

Panel A: Full Sample (86 Sections, Classes of 1997-2004)

| | Mean (St.Dev.) | | | |
| | Full Sample | # of Entrepreneurs | | p-values |
		below median	above median	
Share that Worked as an Entrepreneur	5.4% (3.6%)	2.6% (1.6%)	8.1% (2.9%)	
… in Consulting	22.5% (5.4%)	22.8% (5.4%)	22.3% (5.4%)	0.70
… in Investment Banking	18.7% (5.5%)	18.7% (5.0%)	18.8% (6.1%)	0.94
… in Private Equity	4.6% (3.0%)	5.1% (3.1%)	4.0% (2.8%)	0.08
Share of Section that is Male	70.2% (7.0%)	69.9% (7.4%)	70.5% (6.7%)	0.74
… Has USA Citizenship	66.6% (6.5%)	67.2% (6.5%)	66.0% (6.4%)	0.38
… Has Children	5.1% (3.3%)	4.9% (3.5%)	5.3% (3.1%)	0.58
… Has a Partner	41.5% (7.7%)	42.3% (6.6%)	40.6% (8.6%)	0.29
Average Maximum Risk Score	38.6% (3.1%)	38.6% (2.8%)	38.6% (3.4%)	0.99
Share of Section Having Attended an Ivy League College	24.2% (5.5%)	25.5% (5.1%)	22.9% (5.6%)	0.03
Share of Section Having Attended an Ivy Plus College	34.4% (6.5%)	35.8% (5.5%)	33.1% (7.1%)	0.05

The last column shows heteroskedasticity-robust p-values for the test of no difference in means between the Below-Median and Above-Median subsamples.

Panel B: Predicting the Share of pre-HBS entrepreneurs

Share that Worked pre-HBS in Consulting	-0.07 [0.094]
… in Investment Banking	0.00 [0.072]
… in Private Equity	-0.15 [0.137]
Share of Section that is Male	0.09 [0.089]
… Has USA Citizenship	-0.12 [0.070]*
… Has Children	-0.13 [0.126]
… Has a Partner	0.08 [0.074]
Average Maximum Risk Score	0.06 [0.145]
Year Fixed Effects	yes

$$F(8, 70) = 1.54$$
$$Prob > F = 0.1598$$

Table IV: Correlation Coefficients

	All 86 Sections, Classes of 1997-2004		60 Sections with at Least 60 Responses, Classes of 1997-2004	
	Share of Post-HBS Entrepreneurs	*Share of Successful Post-HBS Entrepreneurs*	*Share of Post-HBS Entrepreneurs*	*Share of Successful Post-HBS Entrepreneurs*
Share of Post-HBS Entrepreneurs	1.00		1.00	
Share of Post-HBS Entrepreneurs	0.13	1.00	0.20	1.00
	(0.221)		(0.132)	
Normalized Share that Worked as an Entrepreneur	-0.04	0.19	-0.24	0.08
	(0.698)	(0.086)	(0.067)	(0.540)
… in Consulting	-0.09	-0.05	-0.14	0.05
	(0.409)	(0.651)	(0.288)	(0.709)
… Investment Banking	0.01	0.00	-0.16	-0.20
	(0.927)	(0.969)	(0.223)	(0.131)
… Private Equity	-0.02	0.01	-0.16	-0.09
	(0.852)	(0.924)	(0.217)	(0.496)
Normalized Section Share that is Male	-0.01	0.08	0.29	0.03
	(0.909)	(0.455)	(0.023)	(0.803)
… Has USA Citizenship	0.01	-0.22	0.35	0.04
	(0.912)	(0.046)	(0.006)	(0.782)
… Has Children	0.01	-0.12	0.23	0.04
	(0.961)	(0.262)	(0.083)	(0.783)
… Has a Partner	-0.11	0.25	-0.26	-0.02
	(0.324)	(0.021)	(0.045)	(0.874)
Normalized Average Maximum Risk Score	-0.02	0.04	-0.06	0.12
	(0.838)	(0.738)	(0.661)	(0.364)
IPO Proceeds in Graduation Year	0.49	0.24	0.58	0.18
	(0.000)	(0.025)	(0.000)	(0.173)
Total Venture Funding in Graduation Year	0.66	0.10	0.71	0.22
	(0.000)	(0.344)	(0.000)	(0.095)

All dollar figues in trillions of current dollars.
p-Values in parentheses.

Table V: Determinants of Post-HBS Entrepreneurship

Dependent Variable:	Share of Post-HBS Entrepreneurs net of *identified* share of Pre-and-post-HBS entrepreneurs			Share of Post-HBS Entrepreneurs net of *average estimated* share of Pre-and-post-HBS entrepreneurs		
Share of section with entrepreneurial background	-0.216	-0.338	-0.415	-0.304	-0.388	-0.477
	[0.110]*	[0.111]***	[0.109]***	[0.105]***	[0.118]***	[0.111]***
Share of section with consulting background	-0.097	-0.081	-0.083	-0.095	-0.081	-0.083
	[0.084]	[0.086]	[0.096]	[0.069]	[0.074]	[0.077]
Share of section with inv. banking background	-0.033	-0.080	-0.185	-0.052	-0.073	-0.170
	[0.076]	[0.090]	[0.111]	[0.059]	[0.072]	[0.084]**
Share of section with private equity background	0.104	0.060	0.085	0.049	0.022	0.053
	[0.109]	[0.138]	[0.129]	[0.101]	[0.129]	[0.120]
Share of section that is male	0.084	0.122	0.646	0.038	0.058	0.633
	[0.090]	[0.082]	[0.250]**	[0.081]	[0.077]	[0.212]***
Share of section that are U.S. citizens	-0.064	-0.101	0.042	-0.072	-0.125	0.058
	[0.080]	[0.107]	[0.154]	[0.066]	[0.095]	[0.125]
Share of section with children	0.133	0.143	0.122	0.106	0.112	0.126
	[0.128]	[0.154]	[0.159]	[0.111]	[0.139]	[0.123]
Share of section with a partner	-0.119	-0.161	-0.171	-0.149	-0.189	-0.199
	[0.064]*	[0.076]**	[0.084]**	[0.055]***	[0.068]***	[0.072]***
Mean maximum risk score of section	-0.130	-0.055	-0.125	-0.078	-0.035	-0.067
	[0.101]	[0.128]	[0.141]	[0.088]	[0.112]	[0.111]
Year dummies	yes	yes	yes	yes	yes	yes
Minimum number of responses	weighted	40	60	weighted	40	60
Observations	86	68	60	86	68	60
R-squared	0.57	0.63	0.68	0.66	0.7	0.76

All regressions are ordinary least squares.
Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table VI: Determinants of Successful and Unsuccessful Entrepreneurship

Panel A. Successful Entrepreneurship

Dependent Variable:	Share of *Successful* Post-HBS Entrepreneurs net of *identified* share of Pre-and-post-HBS entrepreneurs			Share of *Successful* Post-HBS Entrepreneurs net of *average estimated* share of Pre-and-post-HBS entrepreneurs		
Share of section with entrepreneurial background	0.031	0.053	0.027	0.042	0.049	0.035
	[0.033]	[0.045]	[0.033]	[0.015]***	[0.023]**	[0.019]*
Share of section with consulting background	-0.016	-0.053	-0.010	0.008	-0.008	0.016
	[0.032]	[0.046]	[0.042]	[0.015]	[0.022]	[0.021]
Share of section with inv. banking background	0.013	0.005	-0.022	0.007	-0.005	0.001
	[0.024]	[0.026]	[0.026]	[0.010]	[0.013]	[0.011]
Share of section with private equity background	0.011	-0.007	-0.008	-0.012	-0.022	-0.015
	[0.030]	[0.031]	[0.030]	[0.011]	[0.015]	[0.013]
Share of section that is male	0.011	-0.027	0.046	0.014	0.005	0.008
	[0.031]	[0.037]	[0.060]	[0.014]	[0.018]	[0.023]
Share of section that are U.S. citizens	-0.037	-0.066	-0.026	-0.006	-0.025	-0.001
	[0.032]	[0.040]	[0.032]	[0.015]	[0.022]	[0.013]
Share of section with children	-0.030	-0.028	0.016	-0.026	-0.033	0.004
	[0.044]	[0.050]	[0.032]	[0.026]	[0.030]	[0.012]
Share of section with a partner	0.030	0.036	0.007	0.017	0.020	0.003
	[0.020]	[0.023]	[0.018]	[0.010]	[0.013]	[0.007]
Mean maximum risk score of section	0.050	0.076	0.050	0.005	0.009	0.002
	[0.036]	[0.048]	[0.037]	[0.015]	[0.021]	[0.015]
Year dummies	yes	yes	yes	yes	yes	yes
Minimum number of responses	weighted	40	60	weighted	40	60
Observations	86	68	60	86	68	60
R-squared	0.23	0.38	0.18	0.28	0.40	0.21

All regressions are ordinary least squares.
Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Panel B. Unsuccessful Entrepreneurship

Dependent Variable:	Share of *Unsuccessful* Post-			Share of *Unsuccessful* Post-HBS		
Share of section with entrepreneurial background	-0.224	-0.354	-0.426	-0.326	-0.413	-0.494
	[0.114]*	[0.114]***	[0.116]***	[0.106]***	[0.119]***	[0.115]***
Share of section with consulting background	-0.092	-0.052	-0.076	-0.097	-0.070	-0.088
	[0.083]	[0.082]	[0.101]	[0.069]	[0.072]	[0.079]
Share of section with inv. banking background	-0.063	-0.115	-0.175	-0.061	-0.072	-0.171
	[0.075]	[0.085]	[0.113]	[0.057]	[0.070]	[0.084]**
Share of section with private equity background	0.098	0.064	0.103	0.057	0.039	0.067
	[0.113]	[0.139]	[0.132]	[0.099]	[0.127]	[0.118]
Share of section that is male	0.085	0.163	0.610	0.029	0.059	0.630
	[0.092]	[0.077]**	[0.246]**	[0.079]	[0.074]	[0.211]***
Share of section that are U.S. citizens	-0.044	-0.070	0.073	-0.066	-0.104	0.065
	[0.072]	[0.096]	[0.142]	[0.063]	[0.092]	[0.122]
Share of section with children	0.128	0.120	0.109	0.122	0.132	0.124
	[0.126]	[0.151]	[0.158]	[0.110]	[0.137]	[0.124]
Share of section with a partner	-0.144	-0.186	-0.186	-0.158	-0.198	-0.197
	[0.067]**	[0.078]**	[0.087]**	[0.055]***	[0.068]***	[0.073]***
Mean maximum risk score of section	-0.172	-0.127	-0.174	-0.088	-0.049	-0.075
	[0.095]*	[0.116]	[0.136]	[0.085]	[0.107]	[0.110]
Year dummies	yes	yes	yes	yes	yes	yes
Minimum number of responses	weighted	40	60	weighted	40	60
Observations	86	86	68	86	86	68
R-squared	0.56	0.64	0.67	0.67	0.71	0.77

All regressions are ordinary least squares.

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table VII: Determinants of Successful and Unsuccessful Post-HBS Entrepreneurship: Robustness Checks

Dependent Variable: Share of Section Becoming Entrepreneurs Post-HBS Which Are…

	"Super" successful	Not "super" successful	Successful with Ivy+ controls	Unsuccessful with Ivy+ controls	Successful	Unsuccessful
Share of section with entrepreneurial background	0.019	-0.222	0.022	-0.219	0.103	-0.520
	[0.018]	[0.109]**	[0.033]	[0.122]*	[0.118]	[0.146]***
Share of section with consulting background	-0.018	-0.083	-0.014	-0.093	-0.072	-0.119
	[0.016]	[0.087]	[0.033]	[0.085]	[0.111]	[0.125]
Share of section with inv. banking background	0.007	-0.047	0.015	-0.064	-0.117	-0.112
	[0.011]	[0.077]	[0.024]	[0.075]	[0.115]	[0.114]
Share of section with private equity background	0.010	0.105	0.021	0.093	-0.013	0.357
	[0.018]	[0.112]	[0.030]	[0.125]	[0.147]	[0.158]**
Share of section that is male	0.000	0.083	0.008	0.087	-0.075	0.426
	[0.016]	[0.091]	[0.032]	[0.095]	[0.184]	[0.186]**
Share of section that are U.S. citizens	-0.010	-0.053	-0.039	-0.043	-0.071	0.022
	[0.012]	[0.080]	[0.032]	[0.073]	[0.103]	[0.103]
Share of section with children	0.036	0.099	-0.037	0.131	-0.093	-0.043
	[0.020]*	[0.133]	[0.046]	[0.133]	[0.170]	[0.177]
Share of section with a partner	-0.010	-0.116	0.028	-0.143	0.006	-0.123
	[0.010]	[0.066]*	[0.020]	[0.068]**	[0.060]	[0.069]*
Mean maximum risk score of section	0.003	-0.132	0.054	-0.174	0.135	-0.182
	[0.014]	[0.098]	[0.038]	[0.095]*	[0.161]	[0.158]
Share of section having attended an "Ivy Plus" college			-0.023	0.012		
			[0.021]	[0.070]		
Total IPO proceeds in graduatation year					0.314	-1.345
					[0.523]	[0.587]**
Total venture financing in graduation year					0.146	1.393
					[0.246]	[0.276]***
Year dummies	Y	Y	Y	Y	N	N
Minimum number of responses	weighted	weighted	weighted	weighted	60	60
Regression type	OLS	OLS	OLS	OLS	Tobit	Tobit
Observations	86	86	86	86	60	60
R-squared	0.260	0.560	0.240	0.560		

All dollar figues in trillions of current dollars.
Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table VIII: Variance in Post-HBS Entrepreneurship Rates

	For sections with below median number of students with entrepreneurial background	*For sections with above median number of students with entrepreneurial background*	*p-Value, test of null hypothesis of no difference*
For All Sections			
Standard Deviation of Entrepreneurship Rate			
Total Post-HBS Entrepreneurship	4.15%	2.58%	0.003
Successful Post-HBS Entrepreneurship	0.77%	1.23%	0.003
Unsuccessful HBS Entrepreneurship	4.17%	2.44%	0.001
68 Sections with at Least 40 Responses			
Standard Deviation of Entrepreneurship Rate			
Total Post-HBS Entrepreneurship	4.43%	2.54%	0.002
Successful Post-HBS Entrepreneurship	0.65%	1.33%	0.000
Unsuccessful HBS Entrepreneurship	4.37%	2.34%	0.001
60 Sections with at Least 60 Responses			
Standard Deviation of Entrepreneurship Rate			
Total Post-HBS Entrepreneurship	4.57%	2.54%	0.003
Successful Post-HBS Entrepreneurship	0.53%	0.75%	0.062
Unsuccessful HBS Entrepreneurship	4.45%	2.35%	0.001