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Dissertation Title: Essays on Entrepreneurship

Abstract

This dissertation consists of three essays on entrepreneurship. How prior firm-founding experience affects subsequent venture performance is the common theme in the first two essays. The third essay examines the relationship between bankruptcy law and entrepreneurial activity.

I examine the effect of a founder's prior firm-founding experience on the survival rate of subsequent ventures in the first essay, and on the annualized rate of return on investment in subsequent ventures in the second essay. Estimates of this relationship take into account selection effect of serial entrepreneurs and two roles of venture capitalists (VCs): i) evaluating venture quality by screening deals and ii) adding value to the portfolio company through mentoring. An analysis of U.S. VC-financed semiconductor firms that entered the market during 1995-1999 shows that prior firm-founding experience helps entrepreneurs acquire skills that are conducive to the survival of early-stage firms, but not necessarily conducive to the financial success of a venture as measured by the annualized rate of return on investment. In addition, I find that the mentoring role of VCs helps the portfolio company survive through the early stages of a venture and earn a higher rate of return. These findings add to our understanding of how founders acquire entrepreneurial skills and the usefulness of these skills in entrepreneurial activities. These findings also shed light on the potential deadweight loss that may be imposed on the economy if serial entrepreneurs had not been funded because of past failure. Given the low success rate of entrepreneurship, this has implications for countries where failed entrepreneurs rarely get a second chance.

The third chapter investigates the effect of the U.S. bankruptcy reform act of 2005, which made bankruptcy more costly for debtors, on entrepreneurial activity as measured by the likelihood of switching into self-employment. I find that the bankruptcy reform act of 2005 reduced entrepreneurial activity for unincorporated firms and for small incorporated firms but not for medium- or large-size incorporated firms. This implies that evaluation of a country's bankruptcy law, which structures the monetary consequences of failure, should include analysis of the estimated impact of the law on entrepreneurial activity.

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Executive Summary

This dissertation consists of three essays on entrepreneurship. How prior firm-founding experience affects subsequent venture performance is the common theme in the first two essays. The third essay examines the relationship between bankruptcy law and entrepreneurial activity. Section 1 provides an executive summary for the first two essays combined and Section 2 provides that for the third essay.

1. Serial Entrepreneurs and Venture Performance: Evidence from U.S. Venture-Capital-Financed Semiconductor Firms

Economists believe that entrepreneurship promotes innovation and creates more employment opportunities, especially by innovative firms (Baumol 2007, Acs and Armington, 2006, Audretsch, Keilbach and Lehmann 2006). Entrepreneurship is encouraged in many countries because it is believed to be associated with economic growth and competition in the market economy (Djankov, La Porta, Lopez-De-Silanes, and Shleifer 2002). Yet, making an innovative firm survive and thrive is no easy task. Prior literature (Gompers, Kovner, Lerner, and Scharfstein 2006, Kaplan and Schoar 2005) suggests that a large component of success in entrepreneurship and venture capital can be attributed to skill rather than luck. However, the finding that skill matters for entrepreneurial success still leaves us wondering how entrepreneurs develop entrepreneurial skills. I hypothesize that entrepreneurial skills are developed through learning-by-doing. This means firm-founding experience itself enhances human capital and social capital of entrepreneurs, which augments endowed skills.

How does prior firm-founding experience affect subsequent venture performance? In this study, I examine the effect of founders' prior firm-founding experience on the survival rate and the annualized rate of return on investment in subsequent ventures. Estimates of this relationship take into account selection effect of serial entrepreneurs and two roles of venture capitalists

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(VCs): i) evaluating venture quality by *screening* deals and ii) adding value to the portfolio company through *mentoring*.

Firm survival is related to the post-entry performance of new firms such as profitability, size, and growth. Arguably, firm survival is a comprehensive measure of firm performance (Klepper 2002, Stigler 1958), and, for Organizational Ecologists, organizational survival is the ultimate indicator of success (Carroll and Hannan 2000, Hannan and Freeman 1977, 1989). A longer period of survival by innovative firms implies that new products and/or services are delivered to consumers, or existing products and/or services are delivered at a lower cost for a longer period of time. A sufficient number of independent firms surviving in a given industry imply there will be adequate competition in the market. However, while a firm's longer survival implies better performance than short-lived firms in some cases, there is still a difference in performance among surviving firms and even among short-lived firms that the firm survival analysis does not show. Therefore, I augment the survival analysis with an analysis of the financial performance of the venture by computing its annualized rate of return on investment.

To start a firm, entrepreneurs put together teams of people and assemble resources and capital to develop and market a new product or service. The entrepreneurial process requires founders to exercise a variety of skills, such as writing an effective business plan, securing funding from investors, working with lawyers and accountants, and developing a marketing plan and sales force. In addition, entrepreneurs must have sufficiently good knowledge in a wide variety of areas to hire the right personnel or to outsource to the right vendors. As Lazear (2004, 2005) points out, an entrepreneur has to be a generalist, a "jack-of-all-trades." Entrepreneurs may be endowed with a broad set of skills that are then supplemented by investing in human capital such as formal schooling (Bates 1985, 1990). Entrepreneurs can also augment skills through "learning-by-doing" in the process of building a firm, which may be particularly important given that some entrepreneurial skills are subtle and hard to teach in a classroom setting. Because of the importance of learning-by-doing, experienced founders are expected to have an advantage over first-time entrepreneurs in their subsequent ventures, and this advantage should manifest in terms of better firm performance at an early stage when the skill set of the founder is most relevant.

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When entrepreneurs start an innovative firm, they raise capital from VCs. In this process, VCs provide capital to the startup firm and also contribute to entrepreneurship in other ways. VCs commonly finance portfolio companies in the form of convertible securities (Casamatta 2003, Hellmann 1998, Kaplan and Strömberg 2003), have seats on the board of directors (Lerner 1995), and actively get involved with the day-to-day operations of the portfolio company (Hellmann and Puri, 2002, Gompers and Lerner 2004, Gorman and Sahlman 1989, Sahlman 1990). VCs also leverage their network to add value to portfolio companies (Hochberg, Ljungqvist, and Lu 2007). As mentioned above, the two main roles of VCs are i) *screening* deals and ii) *mentoring* portfolio companies.

Screening deals is the process of selecting the most promising business operation amongst many entrepreneurial firms by evaluating startup firm quality, which includes its business plan and its team members. A VC firm's screening ability is necessary to ensure efficient allocation of scarce capital to the most viable projects. Mentoring by a VC firm is the process of actively adding value to the startup firm through mentoring activities such as providing input into its business plan or discussing marketing strategy, and also by monitoring the startup firm's progress by imposing deadlines for tasks before funding in subsequent rounds. Entrepreneurs would prefer to raise capital from VCs with better mentoring ability because they expect this assistance to translate into better firm performance (Hsu 2004). Once a venture is selected for funding, we would expect those funded by VCs with better mentoring ability to have better performance.

To test these hypotheses, I analyze the performance of U.S. VC-financed semiconductor firms that entered the market during 1995-1999. For the purpose of this study, the date a startup company secured its first round of VC-financing is considered as the entry date. I define entrepreneurs as those individuals who are "founders" of a startup firm. I compare firms that were founded by entrepreneurs who have founded firms multiple times, which I refer to as "serial entrepreneurs," and firms that were founded by first-time founders, which I refer to as "novice entrepreneurs."

I focus on the semiconductor industry because it provides a relatively homogeneous group of early-stage firms with some useful properties. First, the semiconductor industry is a capital-intensive industry because of the cost of EDA tools (Electronic Design Automation tools),

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chip designers, and contract manufacturing, and so usually requires capital from VCs before market entry. Therefore, VC-financed firms well represent new firms created in the industry. Second, few entrepreneurs have founded more than two semiconductor firms during their lifetimes in this industry during our data period. This is, most likely, because the fabless model that facilitates entry by new firms was not practical until the late 1980s. Hence, serial entrepreneurs are usually in their second venture during this period, which makes the comparison with novice entrepreneurs more straightforward. Third, since the survival probability of firms varies across industrial sectors (Audretsch 1991), focusing only on the semiconductor industry eliminates heterogeneity across industries. In addition, I limit the time period to 1995-1999 in order to have a fairly constant macro-economic environment when firms were founded and also to allow at least eight years of observing firm performance as of 2007.

Using data from Dow Jones *VentureSource* database (previously called *VentureOne*), *VentureXpert* and *Sand Hill Econometrics*, an analysis of U.S. VC-financed semiconductor firms that entered the market during 1995-1999 does not show evidence of selection of highly-capable serial entrepreneurs and indicates that the survival rate of firms founded by serial entrepreneurs is substantially higher than that of firms founded by novice entrepreneurs. I also find that prior firm-founding experience helps entrepreneurs acquire skills that are conducive to the survival of early-stage firms, but not necessarily conducive to the financial success of a venture. In addition, I find that the mentoring role of VCs helps the portfolio company survive through the early stages of a venture and earn a higher rate of return on investment.

The findings of this study add to our growing understanding of how founders acquire entrepreneurial skills and in what ways these skills are useful in entrepreneurial activities. Assessing the relationship of prior firm-founding experience with firm performance sheds light on the potential deadweight loss that might have been imposed on the economy if serial entrepreneurs had not been funded. Given the low success rate of entrepreneurship, this has implications for economies where failed entrepreneurs rarely get a second chance. The finding that serial entrepreneurs do not necessarily earn a higher financial return but merely survives longer implies that there could be an incentive misalignment for funding serial entrepreneurs to utilize their enhanced human capital.

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2. Bankruptcy Reform Act of 2005 and Entrepreneurial Activity

Small businesses are an important feature of the U.S. economy. Small businesses (defined as firms with fewer than 500 employees) account for almost half of all gross revenues generated by U.S. businesses, employ half of all private sector workers, and generate between 60 and 80 percent of net new jobs (Gates and Leuschner 2007). Entrepreneurship is an important element of technological progress and economic growth, and many government policies have important implications for entrepreneurs and small-business owners. Among the government policies that have profound implications on small business and self-employment is bankruptcy law because it dictates the severity of the consequences of business failure (Armour and Cumming 2008).

Bankruptcy is the legal process by which financially distressed firms and individuals resolve their debts. Bankruptcy law also affects the possibility for a bankrupt entrepreneur to start again (Landier 2005). In the U.S., there are two types of bankruptcy procedures depending on the entity that files for bankruptcy – personal bankruptcy procedure and corporate bankruptcy procedure. While corporate bankruptcy refers to the bankruptcies of large- or medium-sized incorporated firms, personal bankruptcy refers to the bankruptcies of individual households and small businesses (White 2007a). Small business bankruptcy is treated as part of personal bankruptcy because many small businesses are not incorporated and are owned by individuals who are legally responsible for their businesses' debts; the business and its owner are legally the same. This means that debts of the business are personal liabilities of the business owner. When their businesses fail, owners often file for bankruptcy so that their businesses' debts will be discharged along with their unsecured personal debts.

Even when small businesses are incorporated, personal bankruptcy law is important when they fail. This is because lenders that make loans to small incorporated firms, usually startups, often require the owner to personally guarantee the debt and may also require that the owner give the lender a second mortgage on the owner's house. The lenders know that the firm does not have adequate assets to back the debt, and the firm's assets can be diverted to the owner. In effect, lenders do not see small businesses as a separate incorporated firm or entity (Berkowitz and White 2004). Thus, despite limited liability, these guarantees and liens eliminate the legal

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distinction between the incorporated firm and its owner for purposes of the particular loan. The fact that about 20% of all personal bankruptcy filings in the U.S. include some business debt suggests the importance of personal bankruptcy policy for small businesses (Sullivan, Warren, and Westbrook 1999, Lawless and Warren 2005). In this sense, the U.S. personal bankruptcy system is the de facto bankruptcy procedure for small firms whether they are incorporated or not, although it is primarily intended as a bankruptcy procedure for consumers (Fan and White 2003).

Prior to the bankruptcy reform of 2005, if a small business failed, entrepreneurs were allowed to choose between two different personal bankruptcy procedures known as Chapter 7 (also known as “liquidation”) and Chapter 13 (also known as “adjustment of debts of consumers with regular income”). Under both procedures, creditors must immediately terminate all collection efforts and legal actions to obtain repayment once debtors file for bankruptcy. Entrepreneurs filing under Chapter 7 give up all assets that exceed their state exemption level to the bankruptcy trustee who uses these assets to repay debt, and all future earnings are completely exempt from the obligation to repay— this is known as the “fresh start” in bankruptcy. Exemption levels are set by the states and vary widely¹. Most types of unsecured debt were discharged including credit card debt, installment loans, medical debt, unpaid rent and utility bills, tort judgments, and business debt if the debtor owns an unincorporated business². Other types of debt, including secured loans, student loans, child support obligations, and debts incurred by fraud, cannot be discharged in Chapter 7. Under Chapter 13, entrepreneurs are not obliged to give up any of their assets, but instead they must propose a plan, called a “repayment plan”, to repay part of their debt from future earnings over three to five years, which only the bankruptcy judge – not creditors - can approve³. The plan must give creditors as much as they would have received under Chapter 7, but because debtors had the right to choose between Chapter 7 and Chapter 13 they had no incentive to offer any more than what they would have repaid under Chapter 7 (Berkowitz and White 2004, White 2007b). Only debtors who completed their repayment plans received a discharge from their remaining unsecured debts (White 2007c).

¹ Elias (2006) provides a list of asset exemptions by state.

² If the debtor owns an incorporated firm, then the owner of the firm should follow the corporate bankruptcy procedure as far as the business debt is concerned. If, in addition, the owner had personal debt, then the debtor should separately file under the personal bankruptcy procedure as far as the personal debt is concerned.

³ This is different from Chapter 11 bankruptcy for corporations where creditors can approve or reject.

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Debtors would choose to file under whichever chapter minimized their cost and liability. However, Chapter 13 is generally less favorable to business owners than Chapter 7, because failed entrepreneurs often have no nonexempt assets and because having an obligation to repay past debt from future earnings would make it difficult to start a new business (Berkowitz and White 2004). Entrepreneurs may also shift assets from nonexempt to exempt categories before filing under Chapter 7 in order to minimize nonexempt assets⁴. In addition, unsecured debt discharged in Chapter 13 cannot be higher than \$250,000, while there is no limit in Chapter 7⁵. In fact, about 70 percent of bankruptcy filings occur under Chapter 7, and 95% of debtors who file under Chapter 7 have no non-exempt assets and repay nothing to creditors (Fan and White 2003, and Fay, Hurst and White 2002).

U.S. bankruptcy law used to allow additional benefits under Chapter 13 in order to induce more bankrupts to file under Chapter 13 and repay from future income. If the secured debt is a car loan, then the principle amount of the loan is reduced to the current market value of the car under Chapter 13. Debts incurred by fraud and cash advances obtained shortly before filing could be discharged in Chapter 13, but not in Chapter 7. These are only some of the examples that only apply to Chapter 13 cases. These features were known as the Chapter 13 “super-discharge.” Some bankrupts took advantage of the super-discharge by filing first under Chapter 7, where most of their debts were discharged, and then converting their filings to Chapter 13, where they proposed a plan to repay part of the additional debt covered by the super-discharge. This two-step procedure, known as filing a “Chapter 20,” increased debtors’ financial gain from bankruptcy relative to filing under either procedure by itself (White 2007b). Finally, debtors can file under Chapter 13 as frequently as every six months. In contrast, if the debtor has filed under Chapter 7 within the past six years then the debtor is ineligible to file under Chapter 7 again.

Overall, these features made earlier U.S. bankruptcy law very pro-debtor and meant that the obligation to repay in bankruptcy bore little relationship to the debtor’s ability-to-repay. Many debtors could gain financially from filing for bankruptcy even if their ability-to-pay was high (White 2007c). The number of bankruptcy filings rose dramatically over the years, until

⁴ For example, a nonexempt bank account can be used to pay down mortgages in order to convert it into home equity which is exempt in many states.

⁵ The cost of filing for bankruptcy is also lower in Chapter 7 (about \$600 in 2001) than in Chapter 13 (about \$1,600 in 2001) according to Flynn and Bermant (2002).

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2005 when lenders, such as credit card companies, lobbied long and hard for bankruptcy reform and eventually succeeded which became more pro-creditor.

The bankruptcy reform act of 2005, which is formally known as the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), enacted some major changes. First, the new bankruptcy law does not allow the debtor to automatically choose between Chapter 7 and Chapter 13, but instead has additional requirements that must be met in order to file under Chapter 7, called the “means test”, which basically states that debtors who earn more than a certain income level in the state they are filing for bankruptcy are no longer eligible to file under Chapter 7 (details below). Instead, they must file under Chapter 13. Second, the Act imposes additional costs in filing for bankruptcy by imposing a number of new requirements to debtors, such as taking credit counseling courses and debt management courses, and paying higher filing fees. Debtors may also face higher lawyer fees because bankruptcy lawyers now face strict requirements and can be found liable if debtors provide false information when filing for bankruptcy, and so attorneys might charge a premium for the additional risk and time required for preparation of bankruptcy filing. Finally, restrictions on applying homestead exemptions, allowing super-discharge, and time between multiple bankruptcy filings have been added. All in all, the bankruptcy system after 2005 became less favorable to debtors (White 2007c). As expected, the number of personal bankruptcy filings dramatically decreased after 2005. However, how this new pro-creditor bankruptcy law affects the behavior of small businesses and self-employment is unclear.

This study examines the effect of the bankruptcy reform act of 2005 on entrepreneurial activity as measured by the likelihood of becoming self-employed. A change in the personal bankruptcy law affects entrepreneurial activity primarily in two ways, assuming entrepreneurs face liquidity constraints: 1) Personal bankruptcy law provides a partial insurance against business failure by discharging unsecured debt and offering a fresh start (supply-side effect), and 2) It affects the borrowing cost of capital, as financial institutions charge lower interests on loans as the personal bankruptcy law becomes more pro-creditor (demand-side effect). This study shows the net effect of this trade-off on entrepreneurial activity after the bankruptcy reform act of 2005 made the personal bankruptcy code more anti-debtor. The analysis suggests that the probability of becoming self-employed with an unincorporated firm, regardless of firm size,

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declined after the bankruptcy reform act of 2005, and in this way entrepreneurial activity decreased. The probability of becoming self-employed with an incorporated firm was virtually unchanged by the revised bankruptcy law. This is consistent with the prediction that a change in personal bankruptcy procedures is not related to the decision to start an incorporated firm that is subject to corporate bankruptcy procedures upon failure. However, the case of small incorporated firms is different from large- or medium-sized incorporated firms. The decision to become self-employed by a small incorporated firm responds to the change in the bankruptcy reform act of 2005 in a manner similar to the decision to become self-employed by an unincorporated firm. That is, only the probability of becoming self-employed with a small incorporated firm declined after the bankruptcy reform act of 2005. This is consistent with the view that the distinction between the owner and the firm is blurry for small incorporated firms because owners of small incorporated firms often personally guarantee business debts.

The research discussed here suggests that potential entrepreneurs are responsive to the terms of the personal bankruptcy law, and that the new law reduces the partial insurance provided by bankruptcy more than it improves access to or cost of credit. Under the new bankruptcy law, entrepreneurs bear greater risk. The findings indicate that potential entrepreneurs are less likely to go into business and fewer firms are likely to be started. To the extent that unincorporated firms and, perhaps, small incorporated firms represent disguised unemployment (i.e., respondent is trying to earn some income until a suitable job can be found), the results suggested by this study may not indicate a decline in innovation. However some businesses that might have been started by potential entrepreneurs who were discouraged by the increased risk of entrepreneurship may have contributed to innovation with job creation. Those entrepreneurs who do start a new business despite bearing greater risk will face more constraints in starting a new business, once their first venture fails. This suggests that the intention to prevent consumers from abusing the bankruptcy system has the side effect of deterring some types of entrepreneurship.

Many entrepreneurs go through several business models before they are successful. Failure is part of being an entrepreneur. The harsh provisions of the new law appear to discourage some potential entrepreneurs from starting new businesses and to keep entrepreneurs who have a business failure from starting anew. In this sense, the new bankruptcy law constrains

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serial entrepreneurship. Personal bankruptcy should provide an adequate safety net for entrepreneurs if an economy wants to foster conditions that lead to the creation of new businesses, jobs and technologies.