Earn versus Burn:

Financing Strategies of Successful Entrepreneurial Sell-outs

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Abstract

Researchers' understanding of the overall rewards to entrepreneurship are constrained by a lack of knowledge about the economics associated with exiting ventures. Drawing on a hand-gathered dataset comprising the entire universe of 3,160 private firms acquired by U.S. publicly-traded firms during the years 1996-2006, we offer two contributions to the literature. The first is an empirical assessment of the returns to entrepreneurs who choose to exit by selling their venture to a publically held firm. The second is an insight into an important theoretical question regarding the investments of time and money into startup firms. Prior literature has advocated fuelling venture growth and enhancing returns with equity investment, for example through venture capital or private equity financing. Our results, however, paint a picture of diminishing returns to invested equity, where the primary benefit of equity investment is accelerated liquidity, not terminal value. The implications of these findings touch entrepreneurs seeking to optimize the return on their efforts and capital, new venture investors, policy makers seeking to influence venture growth, and researchers working at the intersection of startups and finance.

1. Introduction

Despite a recent burst in research interest, our understanding of the overall rewards to entrepreneurship is anything but complete. Moskowitz and Vissing-Jorgensen (2002:745) state that "[E]ntrepreneurial investment, which represents a substantial fraction of many investors' portfolios, is relatively understudied and not well understood. Specifically, little is known about the aggregate return to entrepreneurs' equity investments." Of the two monetary components of rewards - earnings from trading (including personal remuneration) has been explored in some depth in the economics literature - usually in comparison to wage work (Hamilton, 2000). The second component of reward – harvesting a substantial share of the ownership in an enterprise at exit - has received little research attention. What we do know about rewards at exit is mainly derived from research on venture capital funded firms, which represent only a tiny fraction of all entrepreneurial ventures (Hall and Woodward, 2010). The returns to successful entrepreneurial exits are to a large extent unexplored because obtaining data on private equity transactions is very difficult. Researchers have recently noted that in the entrepreneurship literature there is far more knowledge about the start-up process and the ongoing maintenance of ventures than the harvesting of value from them (DiTienne, 2012; Mason and Harrison, 2006). Indeed, "[F]ew entrepreneurship scholars have focused on the individual financial rewards and consequences of venture creation…" (Carter, 2011:40), and "Despite theoretical interest in the returns to entrepreneurship, there has been little supporting empiricism." (Carter, 2011:41).

Yet it stands to reason that knowledge about the returns harvested at exit is absolutely fundamental to understanding the overall financial rewards to entrepreneurship, because without exit data it is impossible to close the loop on the entrepreneurial process and thus obtain a complete picture of value creation and capture by entrepreneurs. Entrepreneurs may exit a

venture by selling it, passing it on to family members, initiating a successful IPO, or by liquidating the venture's assets (Shepherd and Zacharakis, 2001; Wennberg et al., 2009). Information regarding the rewards gained through these harvesting mechanisms is important for prospective and practicing entrepreneurs, and private investors as well as researchers. Furthermore, knowledge of entrepreneurial returns is also important for economic policy work, as extant research discusses a number of important puzzles that may be partially resolved by better information about the returns entrepreneurs obtain at exit (Carter, 2011), namely why the returns to private equity appear to be lower than diversified returns (though theoretically they should be higher in order to reflect a premium for investment concentration: Moskowitz and Vissing-Jorgensen, 2002) and why wages accruing to self-employment appeared to be lower than wage earners achieve (Hamilton, 2000). These puzzles are magnified when data from wealth surveys is included, since these surveys often indicate that more than half of high net worth households obtain their wealth from entrepreneurship (Cagetti & De Nardi, 2006).

1.1 Entrepreneurial Exit Literature

This paper is related to the literature investigating various features of exit from entrepreneurship (Bates, 2005; DeTienne, 2010; Dehlen et al, 2012; Shepherd and Zacharakis, 2001; Wennberg et al., 2009) as well as studies that show a renewed interest in the dynamics of firm exit at the population level (McGrath, 2006; Cefis and Marsili, 2011a, b). However, this paper is most directly related to very small set of empirical papers that deal specifically with the financial rewards to entrepreneurship at exit. Hall & Woodward (2010) analyzed the returns to entrepreneurship for the minority class of entrepreneurs who receive venture capital financing (1-2% of the entire population of entrepreneurs). Using a remarkable dataset that captures virtually

all of the VC investments made in the U.S. over a 20 year period, they find that approximately three quarters of VC-funded entrepreneurs make nothing at exit, while a few make a billion dollars, resulting in a mean reward of around $6million at exit. They interpret these highly skewed returns – a small probability of great success coupled with a large probability of zero returns - as indicative of the risks of undiversified entrepreneurship. The Hall and Woodward study has some advantages compared to ours, namely that it captures the returns to both successful and failed ventures, whereas our data is limited to successful sell-outs. However, the disadvantage of studying venture-backed firms is also evident in that the sample of ventures is skewed in terms of funding availability, unrepresentative of the typical entrepreneurial venture, and further skewed by the strategies VCs use to reach exit (Arora and Nandkumar, 2011). Therefore the Hall & Woodward (2010) paper leaves open the question of rewards to the other 98-99% of entrepreneurs that build ventures without venture capital funding – a population our data better represents. Two papers by Brau and colleagues are also closely related to ours, in particular the type of data used. Brau et al. (2003) relate the determinants of the decision to IPO a venture versus conduct a sell-out. The study finds that a) larger ventures are more likely to IPO versus sell out to an acquirer (acquirers were public firms in their sample, just as in ours), b) various industry effects are present, and c) timing effects both IPOs and sell-outs with herding evidenced in these data. In follow-on research, Brau et al. (2010) study harvesting strategies of ventures, namely the returns to dual-track sell-outs (ventures that simultaneously pursue IPO and private sales) versus single track sell-outs (i.e. ventures that either IPO or sell-out directly). The bulk of the sample consisted of non-VC-funded ventures (Brau et al., 2010:393-4). Findings show that dual track sell-outs achieve systematically higher valuations than single track sell outs. The authors interpret the results as an indication of real option effects and that IPO filings reduce

information asymmetries between ventures and their bidders. However, neither of these two papers addresses the rewards to entrepreneurs at exit and the use of financial strategies to get there, which is the purpose of our work.

1.2 Market Imperfections and Venture Funding

A central proposition of the economics literature is that capital market imperfections have significant influence on the financing choices of entrepreneurial ventures (Hubbard, 1998). These market characteristics create a large wedge between the cost of internal (founder's equity and internal cash flows) and external (bank loans and outside equity) sources of finance (Carpenter and Petersen, 2002; Myers 1984 and 2001). As a result many researchers argue that it is difficult for entrepreneurial ventures to secure the external financing they need at a reasonable cost (Colombo and Grilli, 2007) and that these costs overwhelm the forces that would otherwise lead to optimal financing arrangements for entrepreneurial ventures (Fama and French, 2002). The principle source of these difficulties is asymmetric information between potential external suppliers of finance and entrepreneurial ventures (Arrow, 1962; Stiglitz and Weiss, 1981). These information problems can lead to adverse selection and moral hazards in external financial markets. Adverse selection occurs when external financiers cannot disentangle high and low quality financing requests but suspect that entrepreneurs have better (insider) knowledge of the venture's actual worth (Akerlof, 1970). Moral hazard occurs when external investors have limited means to control the ex post behavior of entrepreneurs, such as the amount of effort entrepreneurs invest in the venture (de Bettignies, 2008). Under these circumstances the perceived risks and monitoring costs associated with lending or investing leads financiers to demand unreasonably high premiums to entrepreneurial ventures, making external finance

excessively expensive (Watson and Wilson, 2003). Thus, owing to both insider and outsider preferences, firms are theorized to follow a "pecking order" model of financing, whereby they prefer to fund investments with internally generated cash flows, followed by debt, and only on a very limited basis, by issuing equity (Myers, 1984, Vanacker and Manigart, 2010).

The practices used by external financiers have evolved to cope with the informational opaqueness of entrepreneurial ventures. One practice is to use collateral as a criterion for the issuance of loans in lieu of screening processes (Manove et al., 2001). Research indicates that in the U.S. approximately 40% of small business loans and 60% of their value is secured with collateral (usually via the entrepreneur's personal assets, such as real estate) and that collateral requirements are typically larger in less developed economies (Ang, Lyn, and Tyler 1996; Avery, Bostic, and Samolyk, 1998). But individuals who are unable – or unwilling - to lodge collateral are presumably shut out of the credit markets (Carter, 2011). Another practice used by external financiers is relationship lending, which adds qualitative information to banks' and venture capital investors' screening processes, thus acting as a substitute for collateral, and indeed research finds that credit is more available to customers with longer links to their bank, thus reducing the incidence of credit rationing (Berger and Udell 2002), and that venture capitalists tend to have recurring investment relationships with specific entrepreneurs (Gompers et al., 2007). Here again, new firms without prior banking or financing relationships are presumably shut out of credit and investment markets. Finally, outside investors such as venture capitalists insure themselves against moral hazard by taking controlling positions in the firms they finance via heavy board representation, more often holding a majority of seats and votes over the founder entrepreneurs they finance (Kaplan and Strömberg, 2003). Yet despite these mechanisms, some empirical research indicates that entrepreneurial ventures still experience challenges in obtaining

sufficient financing (Holtz-Eakin et al., 1994) and that these financing shortfalls have a significant impact on venture growth and survival (Cassar, 2004). Data at the macro level also supports the suggestion that there is a significant wedge between the costs of internal and external financing (assuming financing is available). For example, Brealey and Myers (2001) highlight that approximately 90% of total investment for U.S. nonfinancial businesses was derived from internally generated cash flows. Survey data from start-up entrepreneurs also supports this, for example UK data from Fraser (2005) and data on Italian high-tech start-ups from Colombo and Grilli (2007) indicate that the vast majority of start-ups (on the order of 80%) are financed exclusively with small amounts of founders' equity. Bank loans represent the next most frequently used financing mechanism, with outside equity extremely rare.

The continued difficulty in raising equity via external financing may be due in part to the nature of entrepreneurial ventures' assets, which magnifies the informational problems encountered in external financing because the assets of entrepreneurial firms are often venture-specific, intangible, and unrecoverable (such as the investments ventures make into research and development and market adoption of their products) (Godfrey and Hill, 1995). Further, though information asymmetry theory it is typically presumed that the agent (in this case, the entrepreneur) has full knowledge of the prospects of the venture, in entrepreneurial ventures it may not be the case that the venture's assets are fully understood by even the entrepreneur (Brau et al., 2010:392). Instead, the value of the venture's investment opportunities may perceived by the entrepreneur, but lacking a full understanding, this information is insufficient to signal the venture's worth to external financiers. As a result, entrepreneurs' perceptions of opportunity cannot be supported with external finance, and the entrepreneur must self-fund their idiosyncratic insights (Barzel, 1987).

2. Hypotheses

The first implication derived from prior work is that information asymmetries lead to financing shortfalls for entrepreneurial ventures: entrepreneurs cannot obtain financing at reasonable costs. Without adequate financing opportunities, entrepreneurial ventures suffer from constraints on growth (Carpenter and Petersen, 2002). Ventures with strong profitability and cash flows will be able to grow faster, but ventures with weaker profitability and cash flows will have to fund growth with debt as a first recourse, or equity in extremis. Those that do manage to secure more equity will loosen these growth constraints, and therefore enjoy higher growth rates than those with less equity (Colombo and Grilli, 2011). Several theories offer mechanisms that support this proposition. First, Carpenter and Petersen (2002) posit a multiplier effect that occurs whenever collateral is required for bank loans. Additional capital enables ventures to obtain more (collateralized) bank loans, thus further boosting the venture's ability to invest in growth. In this case every additional dollar of capital invested in a firm will generate more than an additional dollar of growth via a multiplier effect. Therefore the growth effects of capital investments substantiate via releasing financial constraints on ventures in order that they can better seize growth opportunities. A complementary explanation for the relationship between capital and growth comes from the observation that external capital injections sometimes also bring other "soft" assets with it. Researchers argue that venture growth substantiates also via these assets, such as oversight and coaching by external parties (e.g. venture capitalists: Colombo and Grilli, 2011) leading to improved strategic planning, recruitment of professional management (Hellmann and Puri 2002), development of licensing and alliance strategies, faster speed to market, and signaling or certification of venture quality to other stakeholders (Stuart et al. 1999).

These arguments lead us to hypothesize:

H1: Higher capital invested will be associated with higher growth of ventures.

To achieve exit via selling-out, ventures must grow to sufficient size to make themselves attractive targets for acquisition by public firms, or become large enough to launch an IPO as a means of founder liquidity. Extant research by Brau and colleagues (Brau et al., 2010) suggests that size is a major determinant in the choice between liquidity via IPO or private sale. IPO firms in Brau's sample had mean revenues in the order of $200MM, whereas ventures sold privately averaged $71MM revenues (though this sample excluded private acquisition valued at less than $10MM, which left censors the revenues data). Owing to the higher risks and costs associated with IPOs, some entrepreneurs still prefer to sell their ventures to another firm, despite the discount associated with acquisition (Koeplin et al., 2000). Public firms, on the other hand, look for acquisitions that meet a minimum size in order to gain some assurance that they are material enough to be worth the management and transaction costs (due diligence, financing costs, lawyers fees, etc.) associated with the acquisition (Brau et al., 2003). By virtue of a higher growth rate, entrepreneurial ventures with higher invested capital will grow to a size that is attractive to acquirers faster than those with lower invested capital. Therefore:

H2: Higher capital invested will be associated with lower time to exit via sell-out of ventures.

Acquirers use a variety of metrics to price transactions. Researchers have found that revenue-multiples are one robust indicator of private acquisition prices. For example, Koeplin et al. (2000) use transaction value divided by the revenues of the sell-out firm (in the year before

acquisition) as a measure of the acquisition premium paid by the acquiring firm. Other pricing metrics include revenue growth rates (based on historical data and projected estimates) and multiples of book value. With these and other multiples, the sell-out price is influenced by the size and growth rate of the venture being acquired. We have argued in H1 and H2 that equity invested accelerates the growth of entrepreneurial ventures. Therefore we predict that:

H3: Higher capital invested will be associated with higher sell-out prices of ventures.

A critical – but hereto undiscussed – implication of information asymmetry theory is that entrepreneurial demand for funding is larger than the supply of funding external investors are willing to provide: hence additional equity can be usefully exploited by opportunity rich, but funding poor, entrepreneurs (Shane and Venkataraman, 2000). The logic of information asymmetries argues that entrepreneurs will use external financing when it is attractively priced, i.e. over-bid compared to its "real" value based on their inside knowledge (Amit et al., 1990). External financiers will recognize the risk that entrepreneurs have superior information about their venture's prospects and price offers to reflect these risks, resulting in a large wedge between the costs of financing opportunities via a venture's internal cash flows and financing opportunities with external equity injections. Entrepreneurs will anticipate this, and forego external finance owing to its high costs. Instead entrepreneurs will choose to finance with internally generated cash flows, a strategy associated with reduced information asymmetry problems, or use easily obtainable debt, usually collateralized, which also minimizes information asymmetry problems (Fama and French, 2002). In the prototypical case of entrepreneurs and venture capitalists, Amit et al. (1990:1232) argue that the result of these information asymmetries is that "The less able entrepreneurs will choose to involve venture capitalists,

whereas the more profitable ventures will be developed without external participation because of the adverse selection problem associated with asymmetric information." In short, external financiers will be left with "lemons" i.e. second-best investment opportunities, with the returns to these investments reflecting the inherent conflicts between entrepreneurs and investors. Indeed, much research underscores that as their entrepreneurial experience grows, entrepreneurs become ingenious at identifying lucrative opportunities (Gruber et al., 2008) and finding ways to exploit lucrative opportunities with minimal financial resources (Baker and Nelson, 2005; Starr and MacMillan, 1990). Moreover, entrepreneurs may believe that the exploitation of opportunities using their equity and internal cash flows may be less efficient and effective in exploiting opportunities but may still offer a first-best result. All other considerations being equal, we expect ventures to exhibit a pattern of decreasing marginal returns to equity, reflecting our assumption that ventures with large amounts of book equity usually have raised this from external sources, combined with our arguments from information asymmetry theory that the financing opportunities offered to external sources are by nature second-best. Therefore:

H4: Capital invested into ventures displays diminishing marginal returns to growth, exit speed and sell-out price.

3. Empirical Approach

The questions we address are not only theoretically consequent, but also of pragmatic import to entrepreneurs (and their outside investors, when they have them). How much money does an entrepreneur need to put into a venture in order to realize a liquid return on the asset that is the venture? Will injecting more capital enable a faster exit, and/or with a higher valuation? Which is optimal - a capital infusion strategy, or a "patient" equity strategy, in which the highest

rewards accrue to entrepreneurs that hold a successful, though slower growing, venture for the long term? We thus start the empirical investigation with the intuitive perspective that the entrepreneur's overall return upon exit will depend on three fundamental factors:

- **Money in:** How much capital the entrepreneur (and outsiders) put into the venture. Capital, combined with other data such as retained earnings and dividends paid, provides insight into the basic the financing strategy used to grow the firm into an attractive acquisition target.
- **Time to Exit:** How long the firm exists, and the impact of financing strategy on the time to successful exit.
- **Money out:** Price obtained upon exit, determined by a variety of factors affecting market demand to acquire private firms and the transaction costs of acquiring them.

3.1 Data

In an effort to determine the overall rewards to entrepreneurship at exit, and the drivers thereof, we assembled a unique hand-gathered dataset comprising the entire universe of 3,160 private firms acquired by U.S. publicly-traded entities 1996-2006. These acquisitions were identified using Thomson and Reuter's "Done Deals" data base. The primary source of financial data for these transactions was extracted from SEC filings reporting the acquisitions, and those data were supplemented and merged with data from five additional sources (for the full inventory of data sources, please see Table 1).

---------- Insert Table 1 about Here ----------

The most difficult data to obtain proved to be the date of incorporation for each selling firm and the amount of invested capital prior to the acquisition. Identifying the date of

incorporation was done by analyzing, on a state by state basis, the state's secretary of state incorporation databases. The incorporation date was identified for 2,125 of the ventures. Capturing data on invested capital required analyzing each of the SEC filings associated with the acquisition. One of the authors, a former professional accountant, reviewed the financial statements of the sellers in those filings, separating the retained earnings and paid in capital details from the balance sheet. These data were sufficiently detailed for the study in 2,579 of the ventures. While these data do not offer the source of the paid in capital used by the seller (i.e. we do not know if the provider of the invested capital was the entrepreneur, a friend, an angel investor, a venture capitalist, or otherwise), the distinction allows us to evaluate the financing hypotheses in this study. Prior to conducting our analyses, we performed a test for outliers and eliminated 214 transactions from the data against the criteria that their results were more than 3 standard deviations away from the mean, yielding a total of 1,945 useable transactions for our analyses. The variables and their definitions are detailed in Table 2, with the descriptive statistics and correlations detailed in Table 3.

---------- Insert Tables 2 & 3 about Here ----------

3.2 Empirical analysis

We employ OLS regression to test our hypotheses, examining hypothesized relationships against dependent variables of revenues and assets in order to assess venture growth, of years to liquidity in order to assess exit time, and transaction price. We also conduct posthoc analyses on dependent variables of total profit generated in the transaction and total cash out in order to determine the connection between capital invested and rewards to the entrepreneur, and we include a model that investigates the dependent variable of debt in order to

better understand this prevalent vehicle of startup finance. In order to assess whether venture equity displays diminishing marginal returns, we calculate an additional independent variable as the square of paid in capital. We control for several of the contextual factors that affect valuations obtained by ventures upon exit and therefore determine the capture of entrepreneurial wealth. Specifically we control for the impact of demand conditions and the institutional environment in which the acquisition occurs by controlling for variation across U.S. states in VC disbursements as a proxy for "hot money" effects (Gompers and Lerner, 2000), timing effects related to stock market conditions such as the bubble in stock valuations 1999-2000, and industry effects to control for the valuation effects of "tech" firms (Brau et al., 2003).

4. Results

Analyzing the linkage between the financing strategy employed in entrepreneurial ventures and the characteristics of the exit achieved, we find that increases in equity significantly accelerate venture growth. In Table 4, Model 1, paid in capital is significant against revenue ($p < 0.001$), and against assets ($p < 0.001$) in Model 2, supporting hypothesis 1. Paid in capital per year (a special transformation of the Paid in Capital variable for Model 3, so as to normalize the data for the life of the venture) is negatively and significantly connected with years to liquidity ($p = 0.001$), indicating that capital shortens the time to a successful exit, and supporting hypothesis 2. This result is consistent with research showing that equity injections (e.g. as provided by angel investors and venture capital) substantiate by accelerating the growth of firms to a size at which they are material enough to make either attractive IPO candidates or attractive acquisition prospects for acquirers (such as the public acquirers in our sample: Goldfarb et al., 2007).

---------- Insert Table 4 about Here ----------

Examining the relationship between paid in capital and firm valuation at acquisition, we find a positive and significant connection with price ($p < 0.001$ in Models 4 and 4U), and validate it with a similar post hoc finding using total cash out as an alternative dependent variable ($p < 0.001$ in Model 5), supporting hypothesis 3. We further exploit variation in the total amount of equity invested in ventures in our database to show that equity displays a pattern of significant diminishing marginal returns to growth ($p = 0.003$; Model 1, $p = 0.006$; Model 2), exit speed ($p < 0.001$; Model 3), and terminal venture value ($p = 0.001$; Models 4 and 4U) lending support to hypothesis 4. Results of our posthoc analyses indicate significant diminishing marginal returns to total cash extracted from the venture ($p = 0.001$; Model 5) as well profit to the entrepreneur ($p = 0.001$; Model 6) as a function of the total amount of equity invested in ventures in our database, adding breadth to the findings associated with hypothesis 4.

4.1 Investment Capital and Price Detail

Ventures with smaller amounts of equity invested make up an important subset of our sample (see *Figure 1*). Data indicates that a substantial proportion of entrepreneurs in our sample (on the order of 29%) founded ventures with $50,000 or less in total paid in capital and yet successfully harvested their ventures through a private sale to a public firm. This is consistent with prior work showing that in the U.S., new ventures are founded with a median investment of $37,000 (Hurst and Lusardi, 2004 Table A4) and that the median net worth of business owners and the self employed is $176,000 (Cagetti and De Nardi, 2006:840 Table 4).

---------- Insert Figures 1 & 2 About Here ----------

Examining the distribution of exit valuations in Figure 2, the mean exit valuation was just over $28M. The bottom 29% of our sample were acquired for less than $5M with more than half of those garnering valuations of more than $2M.

---------- Insert Figure 3 About Here ----------

Bringing price, paid in capital and venture lifetime together in Figure 3, we provide a visual summary of the complete set of exits observed in our sample.

4.2 Post hoc analysis: Earn versus Burn strategies

Our hypothesized findings suggest that an important trade-off exists in financing strategy for entrepreneurial firms between the acceleration effects of equity (i.e. the rate of revenue growth, increase in speed to exit, and exit price) and the rate of return achieved upon exit (which decreases as more equity is invested in these ventures). This motivates a post hoc analysis to explore a range of reasonable assumptions around which the returns to pursuing a high equity strategy (which we refer to as "Burners", using capital in order to achieve growth and exit) equates to the returns to pursuing a low equity strategy (referred to as "Earners", focusing on revenue and asset growth, and exit value over the long run). In Table 5 we detail the differences between Earners and Burners for the variables of this study by splitting the sample at the median point for the Retained Earnings and Paid in Capital variables.

---------- Insert Table 5 About Here ----------

The differences between the Earners and Burners are statistically significant in several respects. Earners fund growth with money from sales revenue, rather than raising capital investment. Earners produced a mean of $3.3M in retained earnings prior to being acquired, and raised a mean of only $95,055 in invested capital, while the burners accumulated losses

averaging $10.3M prior to being acquired, and raised $13.9M of invested capital. The consequences of this invested capital are material and significant. First, the burners took only 6.5 years from incorporation to acquisition, while the earners took 12.2 years, though the revenues of the two groups at the point of acquisition were comparable (and not statistically different) at $16.8M and $18.3M respectively. Thus, invested capital accelerated burners' growth and time to exit, though (per our earlier results) subject to diminishing "returns" as demonstrated in the regression analyses testing our hypotheses, and without any positive impact on profit to the entrepreneur ($p = 0.612$; Model 6).

In addition, the return on invested capital was significantly different between these two approaches to growing ventures. The Burners grew and exited faster, but their less efficient use of capital significantly reduced their rate of return relative to the Earners. To gauge the return to these discrete financing strategies we performed a return on invested capital (ROIC) calculation. As a group, the Burners produced an ROIC of 16.3% relative to the Earners' 54.3%. This ROIC calculation accounts for the difference in time to exit, for the higher level of total cash out that the Burners produced at exit ($37M vs. $18.4M), and for their differences in paid in capital. It assumes that all of the cash returned from a venture goes equally to the providers of the invested capital, and it does not account for special distributions to 'sweat equity' holders, or debt repayments, which likely overestimates the returns to Burners relative to the Earners.

One further calculation examined average deal profit in dollars (net of sales price less paid in capital) for each year the venture existed. This is one way to gauge the net profit to the entrepreneur for each year of participation in the venture. In nominal terms, Burners averaged $3.4M/year, reflecting a quicker pace to exit, compared to Earners at $1.5M/year. However, with Burners' paid in capital of $13.9M we assume the presence of outside investors such as business

angels and venture capital, in which case the entrepreneur's share of deal profit dollars has to be adjusted to reflect their post-financing equity share. Data on the equity share of entrepreneurs in each venture is not available from our data source and vary considerably by deal. We therefore assumed the post-money share of the entrepreneur (or founding team) is 20%, in which case Burners delivered around $0.7M/year to the entrepreneur, roughly half what Earners achieved in nominal terms. More conservative assumptions about the final payout of entrepreneurs in Burners would further reduce the annual nominal return to Burners relative to Earners (Hall and Woodward, 2010).

4.3 Break-even in marginal returns to increases in paid in capital

The tradeoff decision between accelerating growth and time to exit by raising paid in capital versus growing using retained earnings in returns to the entrepreneur points in favor of the latter choice, owing to the diminishing marginal returns to paid in capital. However, it is critical to remember that this study is based on a sample of exits, a success sample, addressing ventures that both survived and were acquired. As a result, the relationships between paid in capital and exit valuations may be biased if Earners had higher failure rates than Burners (in a random population of ventures), or if a select sample of Burners raise some capital but not so much that the diminishing returns effects of raised capital begins to overwhelm its benefits.

To address these issues, we estimate two break even points that would produce equivalent rates of return among Earners and Burners: a break even failure rate and a break even invested capital amount. Considering failure rate, one might argue that companies unable to raise money likely fail at a higher rate than those that receive equity investments from outside capital providers. In our sample, in order for the ROIC to equate between Earners and Burners, Burners

would need to fail at less than a 10% rate while more than 90% of Earners would have had to have failed. This assumes that mean investment amounts in each group, and mean "total cash out" in each group, hold across the set of startups; only the failure rate is changed, estimating the number of new ventures in an "open sample" of Earners and Burners that would yield the success sample we have.

Next we estimate the breakeven point for the use of paid in capital. In order for Burners to generate the same ROIC as Earners they would have to raise no more than $1.1M of paid in capital. Beyond that amount of paid in capital the marginal return effects of additional paid in capital do not cover the increased cost of capital. As we have held all other variables constant for this estimate, Burners would have to achieve the same acceleration effects from $1.1M of invested capital that they actually achieved from empirical data on an average of $13.9M in paid in capital in order to break even with the Earners – any inefficiency in the Burners' use of paid in capital beyond that would tip returns to the category of Earners.

The differences in required failure rates, and the relatively low breakeven point for paid in capital make it very likely that the Earner strategy achieved better results for entrepreneurs in this study than Burners. These analyses are consistent with the results we report for diminishing returns to raising capital. Clearly, additional paid in capital has an accelerating effect on growth and speed to exit. However, as shown in the ANOVA and the break even analysis (Table 5), as ventures raise more than $1-2M of invested capital, the positive acceleration effects of paid in capital are overwhelmed by the "cost" of that capital, which rapidly reduces the ROIC ventures achieve. Again we interpret these results as consistent with the exploitation of entrepreneurial opportunity in the context of information asymmetries (Amit et al., 1990; Shane and Venkataraman, 2000), i.e. owing to the high costs of bringing in outside equity, entrepreneurs

pursue the most lucrative opportunities available to them with internally generated cash flows, plus easily available debt (Myers, 1984; Wright et al., 2007); only after exhausting the best opportunities using financial means that come readily to hand do they turn to equity injections from outside investors in order to exploit what are marginally less lucrative opportunities. Ceteris paribus, increases in equity appear to be associated with less lucrative opportunities.

4.4 Limitations

Through the manuscript, we have been careful to highlight issues associated with analyzing a success sample, data limitations that curb insight into why entrepreneurs select particular financing strategies, and to control for industry effects, economic environment, and state level factors that might otherwise limit the generalizeability of our findings. Future research should address these weaknesses, empirically by drawing on comparison samples of ventures in order to control for unobserved effects of success bias in our sample, and by applying additional theoretical perspectives to the study of these data.

5. Discussion

We focus our discussion of results toward different audiences of readers.

5.1 For Researchers

A great deal of prior research on entrepreneurship has focused on venture growth as a key dependent variable of interest – it is one of our most common measures of "success". Davidsson et al., (2007) argue that an unintended consequence of the focus on growth is that it has

contributed towards a presumption that growth is a good thing in itself, and therefore to a presumption in favor of variables that contribute to venture growth, included in which is large influxes of investment capital, usually via venture capital investments. Our study confirms that equity investment is a significant driver of growth.

---------- Insert Figures 4 & 5 About Here ----------

But by examining exit valuations with respect to incremental infusions of equity, we highlight the diminishing returns to equity and encourage researchers to develop a more complete and nuanced understanding of the returns among ventures that are not funded with large capital injections, and grow at a slower pace than the more prominent "gazelles" (Acs and Mueller, 2008). While research investigating growth would tend to support entrepreneurs seeking out venture capitalists to fund acceleration, our study opens up questions about the optimal strategies for entrepreneurs concerned with their total rewards over the long run. We already know that over 75% of venture capital funded entrepreneurs end up with nothing (Hall & Woodward 2010). But even after accounting for all the closures/failures is the entrepreneur better off with VC financing? In a success sample of IPOs, Florin (2005) found that entrepreneurs that used VC financing on average generated significantly less wealth for themselves and were much more likely to be fired from the ventures they started.

---------- Insert Figure 6 About Here ----------

Our work, together with these prior studies, highlights a role for building better research knowledge about the rewards to different entrepreneurial financing strategies. We highlight that a set of firms in our sample (Earners) appear to follow the strategy of patient entrepreneurship, perhaps akin to the quintessential patient investor - Warren Buffett. These ventures build over time via revenue growth and retained earnings instead of building on outside money. This

strategy has several potential benefits - control being a key example - as described in the strategies of the fat or sleek (Hvide & Møen 2010). Our data also indicates that for the firms in our sample it was also an excellent financial choice. We see a primary contribution of our work to be to encourage researchers to build the knowledge base required to offer a more complete set of empirically substantiated insights into alternatives in new venture financing strategies, and how they relate to the long term rewards to entrepreneurship.

5.2 For Entrepreneurs

In addition to the theoretical importance of our findings for researchers, our work is also of great importance to practicing entrepreneurs creating real ventures in the real world. First, we supply rare empirical insights into the rewards to entrepreneurship, conditional on success. Our data on the predictors of deal value (Table 4) provide key benchmarks for entrepreneurs in their financial planning and exit planning. Second, we raise the question of whether entrepreneurs are better off using a Burn strategy versus an Earn strategy. Presuming a Burn strategy requires outside equity, this decision has implications for more than just economic return to the entrepreneur. It inherently incorporates the motivations, timing goals, and risk preferences of the investor. Burn strategies especially favor entrepreneurs who are impatient, perhaps because they perceive their opportunity costs to be high owing to a rich set of outside options (which may include other venture opportunities; Arora and Nandkumar, 2011). Our research highlights the trade-off in financing strategy between speed to exit and longer term value at exit. The link between the choices entrepreneurs often make quite early in the life of the venture and the eventual wealth creation and capture at exit shows how important early choices are, and how there are distinctive alternatives for entrepreneurs to select.

5.3 For Business Angels and Venture Capitalists

The work we present here has mixed implications for business angels and venture capitalists who we assume are present as equity investors among many firms in our sample that exhibit paid in capital upwards of $250,000. On the one hand, the strong results we show the acceleration effects of paid in capital on growth: they indicate that angel and VC money really makes ventures move. These growth dynamics create value that gets shared among equity investors and entrepreneurs, but also creates jobs and other beneficial spillover effects quickly, underlining the broader economic case for a competitive venture financing industry. However, as the amounts of equity invested grow, the trade-offs also grow for entrepreneurs, and herein lies the conundrum in particular for VCs, whose steep transaction and monitoring costs incent larger deal sizes. As equity disbursements increase in size, the disparity between Earn/Burn strategies and returns grow larger for entrepreneurs. This is a problem is greatest for high cost professional investors, and lesser for angel investors whose informality keeps costs low and deal sizes smaller – and more optimally sized – for typical entrepreneurs.

5.4 For Policy Makers

Our results speak first to the literature on funding gaps, which has traditionally been an important issue in policy circles (Holtz-Eakin et al., 1994). While the notion that funding gaps are binding on the start-up of most new ventures is controversial (Cressy, 1996; Hurst and Lusardi, 2008), the results of our analysis are consistent with the argument that funding gaps are binding on growth of successful ventures. Our analyses revealed a strong relationship between paid in capital and debt (Table 4, Model 7), consistent with a) a leverage effect of paid in capital

on ability to obtain bank loans (Carpenter and Petersen 2002), b) funding gaps research more generally (Colombo and Grilli, 2007; Cressy, 1996; Stiglitz and Weiss, 1981), and most specific to policy makers, c) with the observation that banks require collateral for lending to take place. (We acknowledge that the results may to some extent to produced by selection effects, e.g. ventures with better growth prospects self-selecting for outside equity funding and bank loans, rather than lending constraints). In light of these findings, policy makers might prioritize banking policies that facilitate the smooth flow of funding to growing ventures, not just new ventures. These ventures typically have longer credit histories and banking relationships already in place, thus mitigating many of the hazards of lending to start-ups. Second, policy makers interested in encouraging entrepreneurship might pay attention to the different financing strategies highlighted in our analyses to avoid policy choices that penalize the major funding vehicle actually used by entrepreneurs, i.e. tax policies that undermine incentives for funding growth from internal cash flows.

5.5 Notable environment effects

Included in our dataset and in our regression models are a number of independent variables that we use as controls in order to isolate the relationships between money in, time to exit, and money out for the entrepreneur. At the same time, those variables are of interest in themselves for specific audiences. Focusing on regression model 4U (Table 4), we consider the unstandardized coefficients in the regression model against acquisition price as a dependent variable. These coefficients offer insight into the estimated dollar values of the relationship between these variables and acquisition price achieved at exit.

Same state effects. Same state transactions were persistently significant across the regression models, and generally negative. In Model 4U (Table 4) same-state transactions showed a $6.8 million discount in the acquisition price as compared with transactions where buyers and sellers were from different states. While we have no theoretical basis for describing this price discount, we speculate that it may indicate that geographical diversification is a significant motivation for acquirers who bought ventures in our data set.

Venture capital disbursement effects. Our data suggests consideration of the impact of venture capital investment activity on acquisition activity. The relationship between venture capital disbursements at the time of, and in the state of founding, is generally non-significant. But we observe venture capital disbursements at the time of, and in the state of acquisition, are significant and large predictors of prices and cash out for transactions in our database. We speculate that this indicates venture capital creates a "hot money" effect of money chasing deals, perhaps by supporting bidding by VC-backed firms for acquisition targets (Gompers and Lerner, 2000). This relationship ought to interest investors and policy makers.

Industry effects (Tech Bubble). We anticipated that timing effects related to stock market conditions such as the bubble in stock valuations 1999-2000, and industry effects to related the valuation of "tech" firms (Brau et al., 2003) would be meaningful. However, we were impressed with the size of these effects. The interaction effect of tech and bubble, even after controlling for industry, accounts for a premium of $10.5 million in terminal acquisition value in Model 4U. This indicates that timing and environmental conditions can have dramatic effects on the valuation of entrepreneurial ventures. We encourage future research to better understand and measure these tech bubble effects.

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Figure 1
Distribution of Paid in Capital

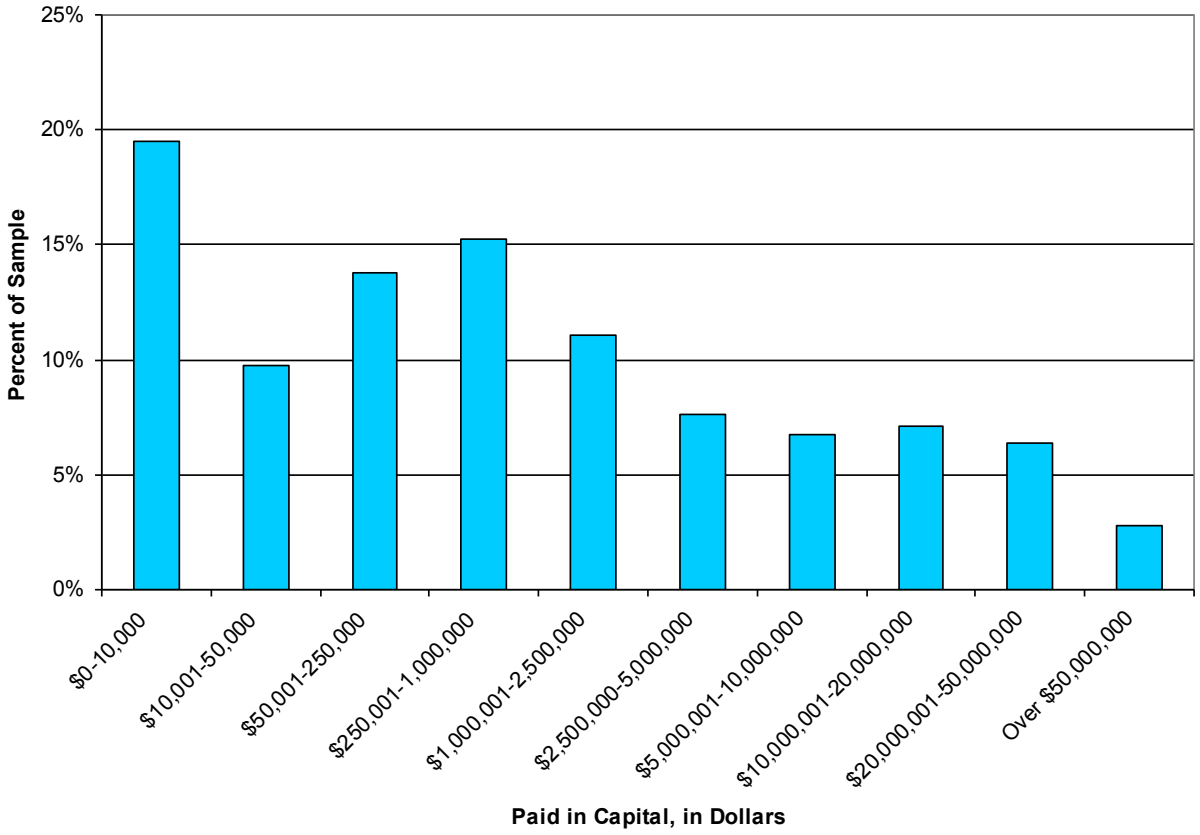

Figure 2
Distribution of Exit Value

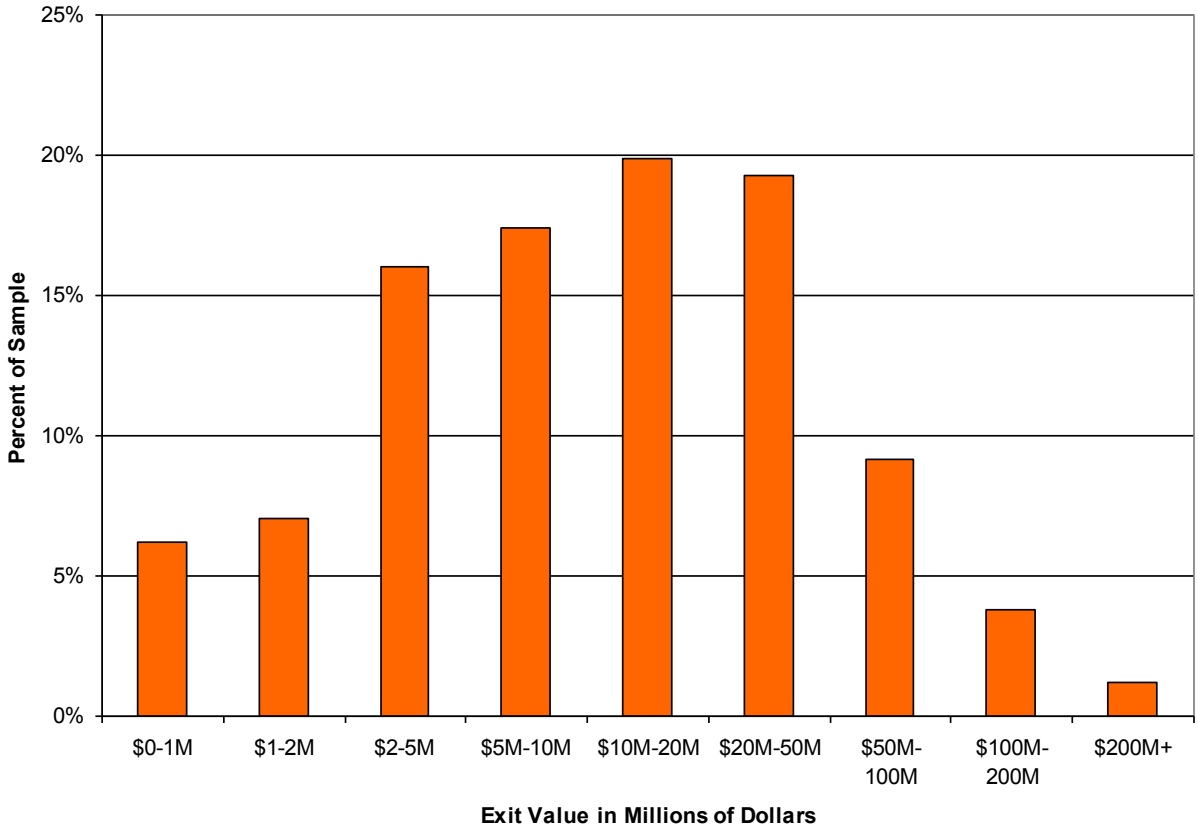

Figure 3
Exit Value with Respect to Paid in Capital and Years of Venture Life

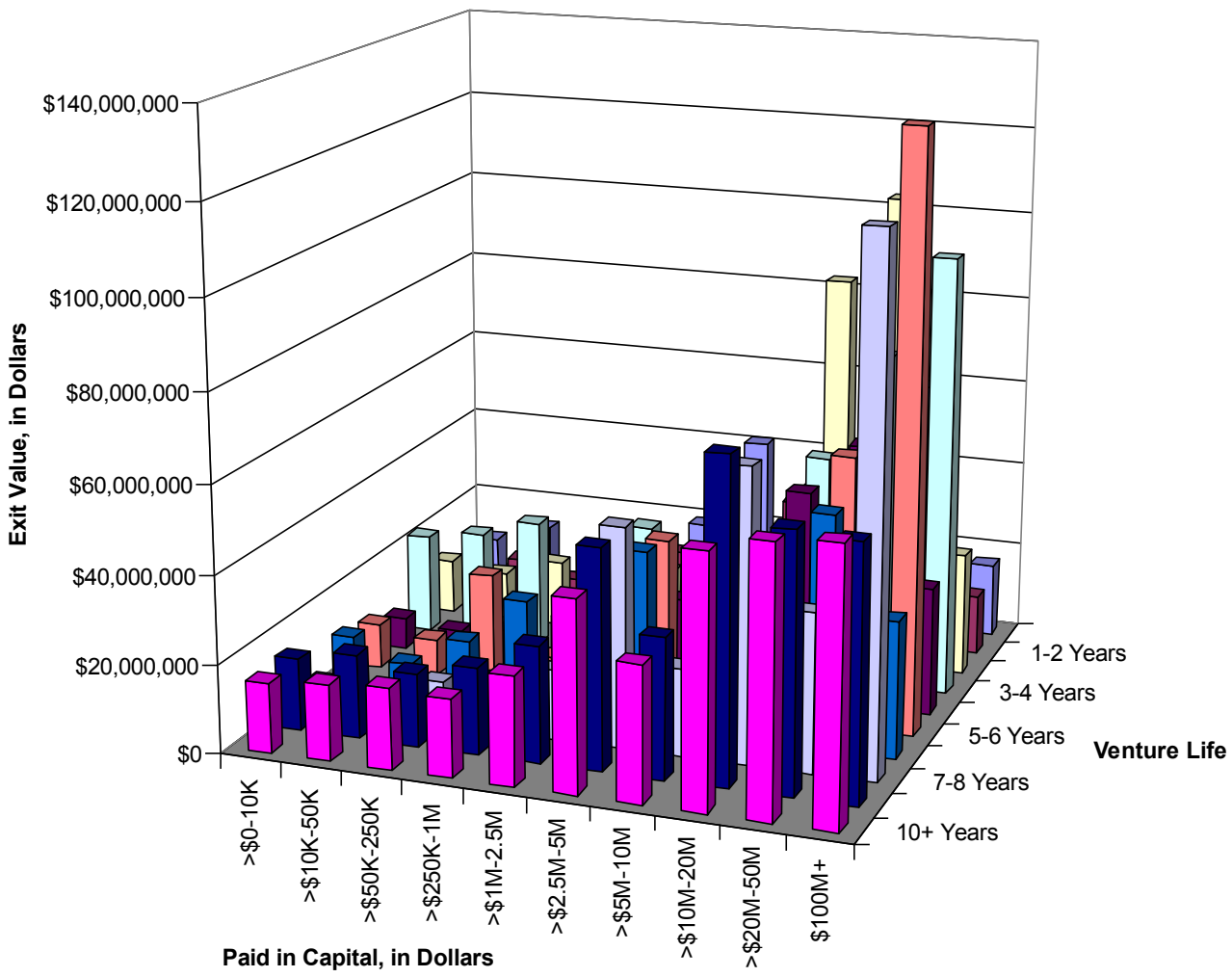

Figure 4
Paid in Capital against Exit Price at Acquisition with Polynomial Regression Overlay

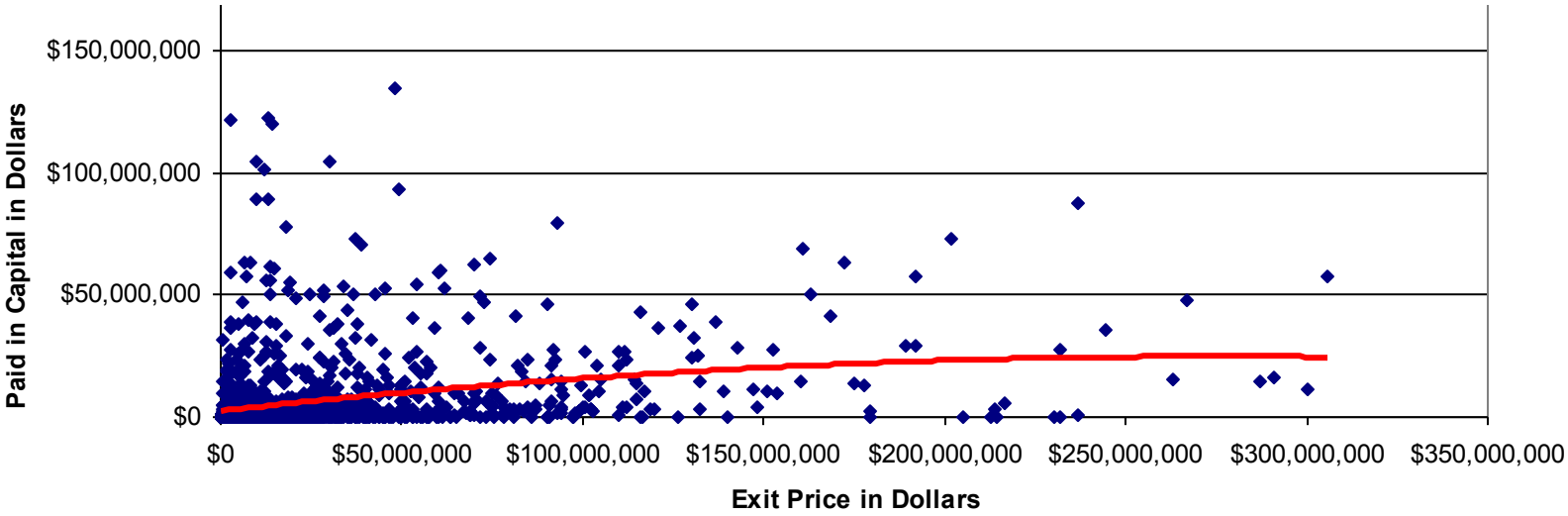

Figure 5
Paid in Capital up to $50,000,000 against Exit Price at Acquisition up to $20,000,000 (Zoom in lower left corner of Figure 4) with Polynomial Regression Overlay

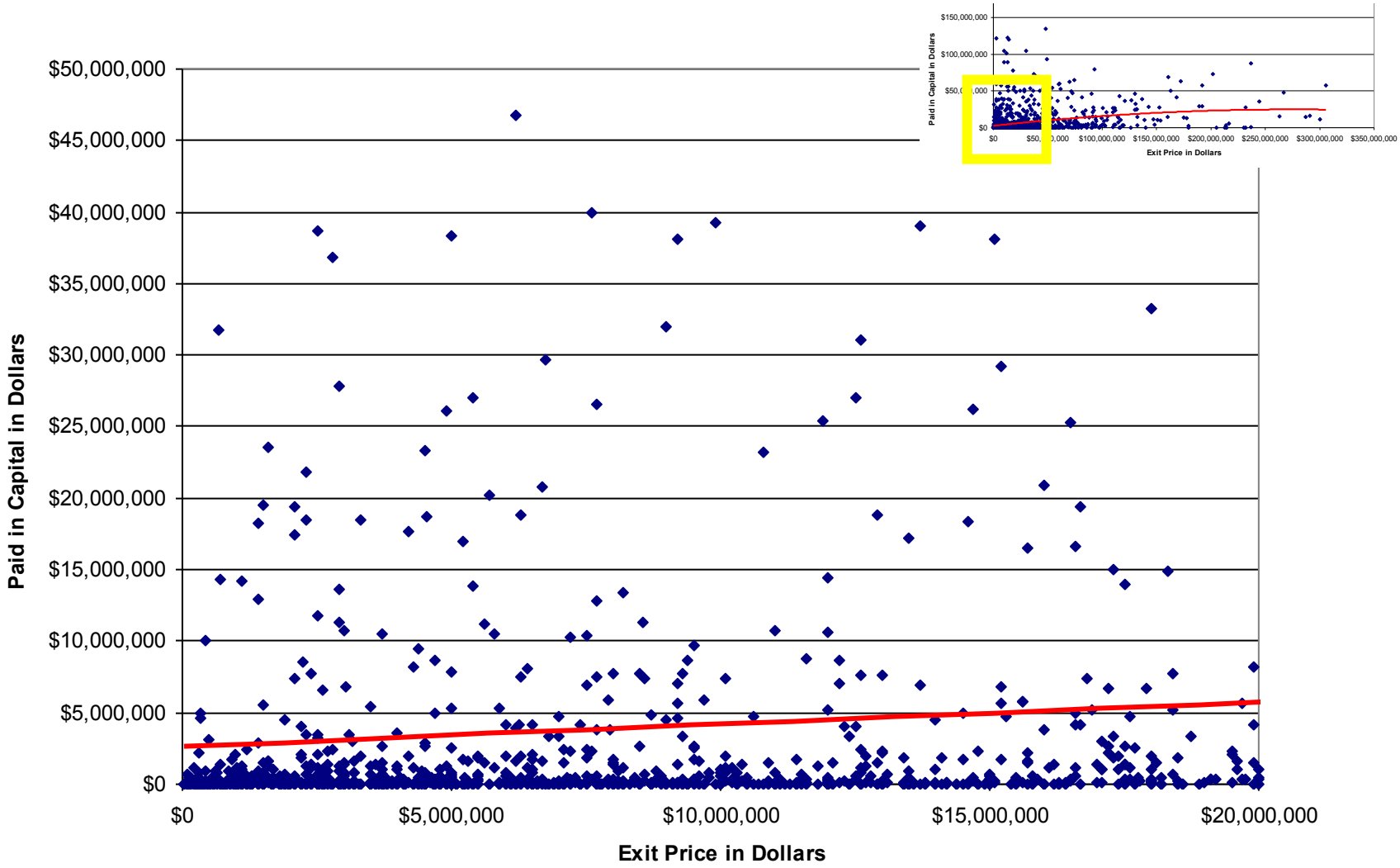

Figure 6
Paid in Capital up to $100,000,000 against Venture Life up to 25 Years, with Polynomial Regression Overlay

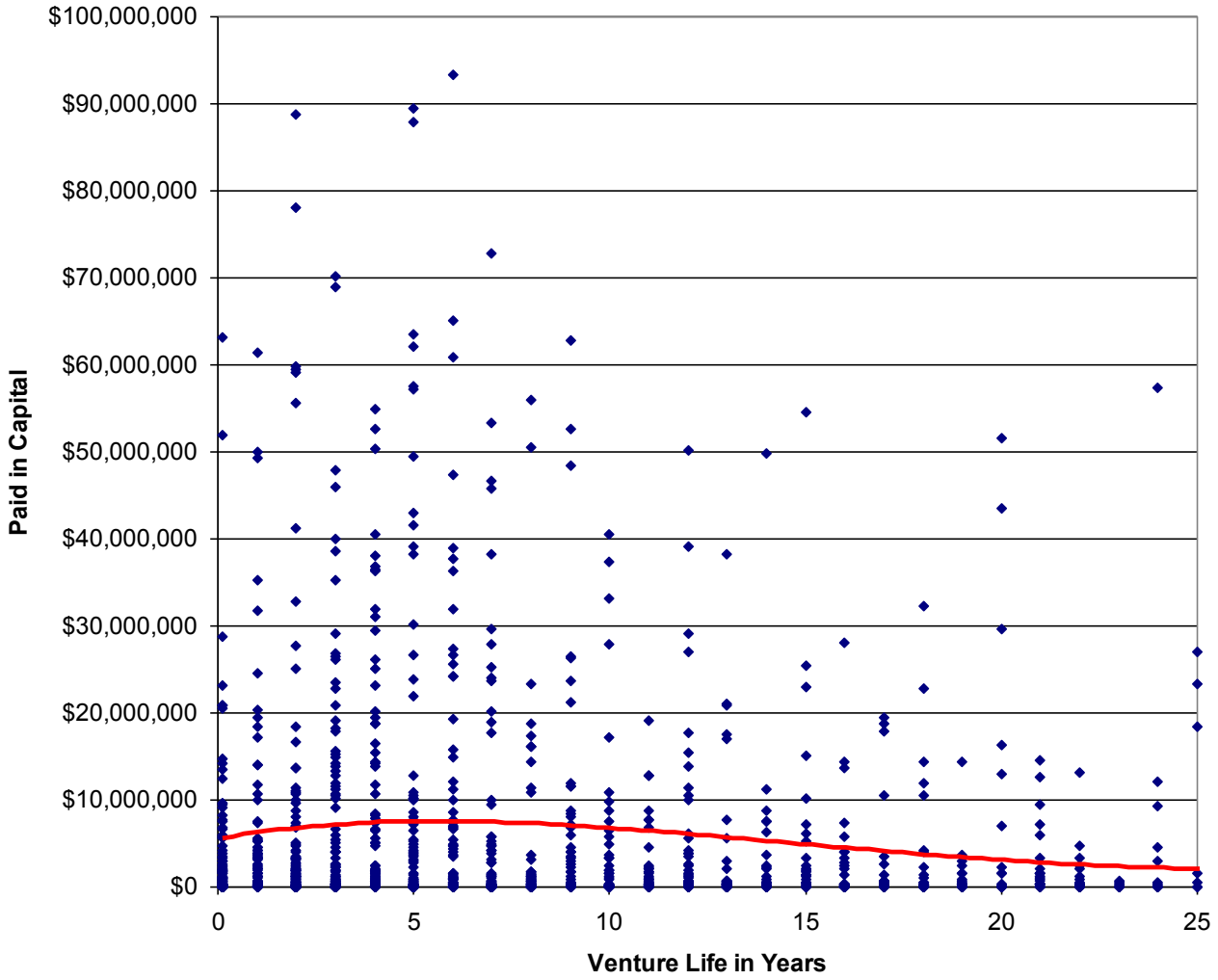

Table 2
Variable Names and Definitions

Variable Name	Variable Definition
Inc Year	year seller Incorporated
Seller Population	seller state population at incorporation
Exit Year	year seller acquired
Tech Bubble	technology company in the 98-00 bubble. (1 is yes)
Exit VC Activity	VC disbursements buyer state in acquisition year
Founding VC Activity	average VC disbursements in seller state over 3 years around year of seller incorporation
Same State	buyer and seller in same State (binary, 1 is yes)
Shareholder's Equity	total shareholder's equity of seller at the point of acquisition
Assets	total assets of seller at the point of acquisition
Debt	total debt of seller at the point of acquisition
Revenue	annual revenue of seller in the year of acquisition
Retained Earnings	accumulated surplus (deficit) of the seller from incorporation to point of acquisition
Paid in capital	total invested in capital received by the seller prior to the acquisition
Total Cash Out	total cash received by the seller at the point of acquisiton
Years	years from incoporation year to year of acquisition
Average Growth Rate	revenue of the seller at acquisiiton divided by years
Deal Profit Dollars	total cashout minus total paid in capital
Return on Capital	total cash out over Paid in capital as a functions of Years

Table 3
Descriptive Statistics and Correlations

Variable	Mean	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Inc Year	1991	1945																	
2 Seller Population (M's)	14.94	912	.054																
3 Exit year	2000	2919	.357**	.063															
4 Tech Bubble	0.18	2919	.119**	.035	-.086**														
5 Exit VC activity (M's)	200.0	2850	.101**	.168**	.018	.539**													
6 Founding VC Activity (M's)	191.9	912	.117**	.495**	.086**	.094**	.234**												
7 Same State	0.33	2478	.105**	.254**	.098**	.016	.101**	.107**											
8 Shareholder's Equity (M's)	1.58	2838	-.196**	-.053	-.058**	-.055**	-.076**	-.089**	.001										
9 Assets (M's)	16.67	2887	-.110**	-.061	.066**	-.126**	-.080**	-.058	.082**	.373**									
10 Debt (M's)	14.66	2824	-.058*	-.050	.092**	-.110**	-.051**	-.020	.081**	-.007	.924**								
11 Revenue (M's)	19.10	2893	-.220**	-.028	.027	-.112**	-.103**	-.074*	-.120**	.231**	.393**	.316**							
12 Retained Earnings (M's)	-1.71	2380	-.235**	-.154**	-.098**	-.103**	-.148**	-.170**	.011	.440**	.230**	.071**	.140**						
13 Paid in Capital (M's)	5.87	2372	.100**	.141**	.116**	-.024	.061**	.180**	-.003	-.092**	.153**	.204**	.111**	-.524**					
14 Total Cashout (M's)	28.40	2691	-.023	.077*	.098**	.060**	.123**	.077*	-.067**	.201**	.396**	.325**	.424**	-.008	.287**				
15 Years	9.3	1945	-.961**	.011	-.083**	-.161**	-.110**	-.030	-.083**	.190**	.132**	.085**	.238**	.220**	-.070**	.060*			
16 Avg Growth Rate	238.7%	1796	.170**	-.034	.027	-.086**	-.094**	-.063	-.084**	.212**	.266**	.219**	.594**	-.010	.160**	.389**	-.173**		
17 Deal Profit Dollars (M's)	21.56	2198	-.062*	.016	.060**	.083**	.129**	-.001	-.059*	.254**	.323**	.239**	.380**	.183**	-.062**	.938**	.089**	.292**	
18 Return on Capital	53.90	1406	.053*	-.044	.006	.036	.044	-.030	.025	-.007	-.019	-.020	-.028	.009	-.023	-.028	-.054*	-.011	-.020

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 4
Regression Models against Different Venture Outcome Variables

Variable	Model 1: Revenue (Growth)	Model 2: Assets (Growth)	Model 3: Years to Liquidity	Model 4: Price	Model 4U: Price (unstandardized)	Model 5: Cash Out (posthoc)	Model 6: Profit (posthoc)	Model 7: Debt (posthoc)
Constant	std.	std.	std.	std.	-$1,849,737,320	std.	std.	std.
Inc Year	-0.028	-0.094 *	omitted	-0.062	-$1,095,093	-0.062	-0.065	-0.095 *
Exit Year	0.064	0.044	omitted	0.115 **	$2,020,668	0.116 **	0.121 **	0.043
Industry	-0.190 ***	-0.030	0.041	-0.032	-$705	-0.031	-0.033	-0.030
Tech Bubble (Binary)	-0.009	-0.102 *	-0.164 **	0.105 *	$10,471,003	0.102 **	0.107 **	-0.102 *
Exit VC Activity	-0.069	-0.017	0.043	0.135 **	$19,459	0.134 **	0.140	-0.016
Founding VC Activity	-0.093 *	-0.061	-0.057	0.025	$4,705	0.025	0.026	-0.062
Same State	-0.096 *	0.105 **	-0.104 *	-0.075 *	-$6,807,392	-0.078 *	-0.081 *	0.105 **
Seller Population	0.028	-0.081 *	0.046	0.054	$0.21	0.053	0.055	-0.080
Shareholder's Equity	0.057	0.315 ***	-0.171 ***	0.056	$178,110	0.058	0.061	-0.145 ***
Assets	omitted	omitted	0.180 ***	0.270 ***	$400,810	0.271 ***	0.283 ***	omitted
Revenue	omitted	omitted	0.125 *	0.286 ***	$471,430	0.289 ***	0.302 ***	omitted
Paid in Capital	0.414 ***	0.510 ***	-0.531 ***	0.430 ***	$1.12	0.423 ***	0.041	0.517 ***
Paid in Capital squared	-0.245 **	-0.218 **	0.340 ***	-0.259 **	-$8.34 EE-009	-0.254 **	-0.265 **	-0.221 **
R squared (Adj. R sq)	12.3% (10.9%)***	20.3% (19.0%)***	17.9% (16.3%)***	37.7% (36.4%)***	37.7% (36.4%)***	37.8% (36.5%)***	32.0% (30.5%)***	18.8% (17.5%)***

* Significant at 5% level ($p < 0.05$), ** Significant at 1% level ($p < 0.01$), *** Significant at 0.1% level ($p < 0.001$)

Note: Model 3 uses Paid in Capital per year and Paid in Capital squared per year to normalize the data by years of venture life.

Table 5
Group Comparisons of Burners and Earners

Variable	N= 539 Burners	N=514 Earners	Test of Significant Difference
Inc Year	1994	1987	0.000
Seller Population	16,643,472	11,136,083	0.000
Exit year	2001	1999	0.000
Tech Bubble	0.28	0.11	0.000
Exit VC activity (M's)	288.5	144.3	0.000
Founding VC Activity (M's)	238.4	115.7	0.000
Same State	0.32	0.25	0.006
Shareholder's Equity (M's)	-2.17	3.56	0.000
Assets (M's)	12.79	9.63	0.007
Revenue (M's)	16.84	18.33	0.449
Retained Earnings	(10,310,733.73)	3,310,482.26	0.000
Paid in Capital	13,919,446	95,055	0.000
Total Cashout	37,051,885	18,442,152	0.000
Years	6.5	12.2	0.000
Avg Growth Rate	266.3%	188.8%	0.006
Deal Profit Dollars	22,236,724	18,347,816	0.064
Return on Capital	16.3%	53.8%	0.046