



Investment and returns in successful entrepreneurial sell-outs



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ABSTRACT

This paper examines returns to capital invested in new ventures. Across theoretical lines of inquiry, outcomes of new venture growth, valuation, and consequent return to entrepreneurs are generally assumed to be a function of access to equity capital. Drawing on a hand-gathered dataset comprising the universe of 3160 private firms acquired by U.S. publicly-traded firms during the years 1996–2006, we analyze a population of heterogeneous investment profiles with clear terminal valuations, lifespans, and distributions to entrepreneurs. The results paint a picture of steeply diminishing returns to invested capital, where the primary benefit of equity investment is accelerated liquidity, not terminal value of the venture or entrepreneur returns.

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1. Introduction

The assumption of capital constraints on entrepreneurs frames much entrepreneurship research (Holtz-Eakin et al., 1994) with the general expectation that in a new venture more cash is better. But owing to limited availability of data on the terminal liquidity value of new ventures, empirical examinations of the *ultimate* merits of this assumption are scarce. Researchers have far more knowledge about the start-up process and ongoing maintenance of ventures than they have about the eventual harvested value (DeTienne, 2010; Mason and Harrison, 2006). In a recent review Carter (2011) concludes that, “[F]ew entrepreneurship scholars have focused on the individual financial rewards and consequences of venture creation...” (p.40), and “Despite theoretical interest in the returns to entrepreneurship, there has been little supporting empiricism.” (p.41).

2. Literature

This study is most directly related to a very small set of empirical papers that deal with the financial rewards to entrepreneurship at exit. Hall and Woodward (2010) analyzed the returns to entrepreneurship for the minority class of entrepreneurs who receive venture capital financing. Using a remarkable dataset that captures virtually all the VC investments made in the U.S. over a 20 year period, they find that approximately three quarters of VC-funded entrepreneurs make

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nothing at exit, while a few make very large returns, resulting in a mean reward of around \$6million at exit. The disadvantage of studying VC-backed firms is evident in that ventures selected for VC investment are atypical of the general population and further skewed by the strategies VCs use to reach exit (Arora and Nandkumar, 2011). Related work focusing on liquidity through IPO (ex: Stuart et al., 1999) is narrower still, offering insights to that class of firm that (a) typically receives venture financing and (b) goes on to issue a public equity offering. This represents about .05% of all new ventures (Rao, 2013). Two papers by Brau et al. (2003; 2010) stand out as they investigate primarily non-VC-funded ventures. In one study, Brau et al. (2003) relate the determinants of the decision to IPO a venture versus conduct a private sale and in follow-on research Brau et al. (2010) study harvesting strategies of ventures that simultaneously pursue IPO and private sale versus only one or the other. Neither study considers the rewards to entrepreneurs at exit or the financial strategies used to achieve them.

Investigations that consider dependent variables beyond new venture valuation at liquidity frequently also adopt a capital constrained perspective. Work related to new venture growth benefits from a wider range of available dependent variable constructs, connecting capital access with new firm scaling along measures such as turnover, assets (Desai et al., 2003) and employees (Davila et al., 2003). Although the relationship between capital and growth is generally positive, there is no work that closes the loop to determine whether the capital used to drive growth is meaningful in the ultimate valuation of the venture, or the eventual returns to the entrepreneur (Davidsson et al., 2009).

Work seeking to understand the overall rewards to entrepreneurship is also incomplete. Attributable in part to limited data availability, 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 the economics literature usually in comparison to wage work (Åstebro, 2013; Hamilton, 2000). The second component – harvesting ownership in an enterprise at exit – has received less research attention and is focused on VC funded firms (Hall and Woodward, 2010).

3. Data

To investigate the relationship between capital constraints and the ultimate rewards to entrepreneurship we assembled a unique hand-gathered dataset comprising the entire universe of 3160 private firms acquired by U.S. publicly-traded entities during the years 1996–2006. The full inventory of sources and model variables is presented in Table 1.

The Thomson & Reuter’s transaction data were complemented with details relevant to this study extracted from other sources. Capturing data on invested capital required analyzing the SEC filings associated with each and every 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 offered sufficient detail on 2579 of the ventures that we could include them in our study. From the individual state business databases, we identified a seller incorporation date for 2125 of the ventures. We thus performed our analyses on the 1847 ventures for which we could identify both financial data and incorporation date. Finally, we gathered contextual data regarding VC activity in the sellers’

Table 1
Variables.

Name	Definition	Data Source
Exit year	Year seller acquired	Thomson & Reuter's done deals database (www.donedeads.com)
Valuation	Total value of acquisition	
Shareholder equity	Total shareholder equity of seller acquisition	SEC 8K filings (http://edgar.sec.gov)
Assets	Total assets of seller at acquisition	
Revenue	Annual revenue of seller at acquisition	
Retained earnings	Accumulated surplus (deficit) of the seller from incorporation to acquisition	
Paid in capital	Total invested capital received by seller prior to acquisition	
Total cash out	Total cash received by seller at acquisition	
Inc year	Year seller incorporated	State Databases (MN ex: mblsportal.sos.state.mn.us)
Seller population	Seller state population at incorporation	Longitudinal business database (www.census.gov)
Exit VC activity	VC disbursements in the buyer state in the acquisition year	PriceWaterhouseCoopers Moneytree and NVCA database (www.pwcmoneytree.com)
Founding VC activity	Average VC disbursements in the seller state over 3 years around incorporation year	
Industry	SIC code of seller	Environment, health and safety (www.ehso.com)
Years	Years from incorporation to acquisition	Calculated
Average growth rate	Revenue of seller at acquisition divided by years	
Deal profit dollars	Total cash out–paid in capital	
Return on capital	Total cash out/paid in capital as a function of years	
Same state	Binary: 1 = buyer & seller in same state	
Tech bubble	Binary: 1 = tech firm between 98 and 00	

and acquirers' states at incorporation year and acquisition year, state population, and industry SIC codes, merging all the data together into a single dataset.

4. Analyses

We employed OLS regression to model our data, examining relationships against outcome variables of revenues and assets in order to assess venture growth, years to liquidity, and transaction price, validating the transaction price model against a dependent variable of total cash out and finally, a dependent variable of total profit generated in the transaction in order to determine the connection between capital invested and rewards to the entrepreneur. To assess the marginal returns on venture equity, we analyze the square of paid in capital. Our models consider the impact of demand conditions and the institutional environment in which the acquisition occurs by including VC disbursements as a proxy for entry and “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 (Braun et al., 2003). As significant variation within industry has been highlighted by prior work (Burns et al., 2009), we include binary variables for seven broad industry SIC categories in our models. Following our main effect analyses, we exploit the richness of our data to offer exploratory insights into inflection points for paid in capital and possible clusters of implied entrepreneur strategy type.

5. Results

Results are presented in Table 2. We find that increases in equity significantly accelerate venture growth as paid in capital is significant against revenue ($p < .001$; Model 1), and assets ($p < .001$; Model 2). Paid in capital is also negatively connected with years to liquidity ($p = .001$; Model 3), indicating that capital is associated with shorter time to a successful exit.

Examining the relationship between paid in capital and firm valuation at acquisition, we find a positive connection with price ($p < .001$; Model 4), and validate it using total cash out as an alternative dependent variable ($p < .001$; Model 5). We further exploit variation in the total amount of equity invested in ventures in our data to show that equity displays a pattern of significant diminishing marginal returns to growth ($p < .001$; Model 1, $p < .001$; Model 2), exit speed ($p < .001$; Model 3), terminal venture value ($p < .001$; Model 4), total cash extracted from the venture ($p < .001$; Model 5) and profit to the entrepreneur ($p = .007$; Model 6). Model 7 offers an analysis of the relationship between paid in capital and debt ($p < .001$), examining the leverage effect of paid in capital on ability to obtain bank loans argued by Carpenter and Petersen (2002), and

Table 2
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 (unstd.)	Model 5: cash out (returns)	Model 6: profit (returns)	Model 7: debt
Constant	std.	std.	std.	std.	–\$1,475,297,157	std.	std.	std.
Inc, year	–.028	–.097*	Omitted	–.053	–\$941,971	–.053	–.056	–.098*
Exit year	.065	.071	Omitted	.096*	\$1,687,706	.097*	.101*	.070
Tech bubble binary	–.016	–.022	–.173***	.083*	\$8,256,421	.080	.084	–.022
Exit VC Disb.	–.066	–.031	.040	.131**	\$18,902	.131*	.136**	–.031
Founding VC Disb	–.100*	–.032	–.072	.014	\$2719	.014	.015	–.033
Construct. Ind. ^a	.024	–.092	–.094*	–.066*	–\$5,952,530	–.068*	–.071*	–.093
Manufact. Ind.	–.121	–.327**	.037	.049	\$0	.048	.050	–.330**
Transport Ind.	–.162	–.189*	–.007	–.095	–\$27,535,936	–.094	–.099	–.187**
Wholesale Ind.	–.028	–.142*	.193	–.143	–\$13,569,796	–.140	–.146	–.143**
Financial Ind.	–.155	.136	.072	–.108	–\$16,458,282	–.102	–.107	.138
Services Ind.	–.315	–.418**	.013	–.114	–\$22,188,976	–.112	–.117	–.420**
Same state	–.093*	.046	.022	–.222**	–\$38,107,140	–.220**	–.230**	.045
Seller Pop.	.028	–.049	.209	–.189	–\$16,214,894	–.185**	–.193	–.048
Shareholder Eq.	.060	.283***	–.166***	.043***	\$135,986	.045***	.047	–.178***
Assets	Omitted	Omitted	.217***	.330***	\$489,158	.330***	.345***	Omitted
Revenue	Omitted	Omitted	.106*	.262***	\$432,674	.266***	.278***	Omitted
Paid in Capital	.425***	.490***	–.551***	.418***	–	.412***	.030	.498***
(Paid in Capital) ²	–.254**	–.203**	.356***	–.273***	–	–.268***	–.280***	–.206**
R squared. (Adj. R squared) (%)	13.1*** (11.1)	31.1*** (29.6)	19.3*** (16.9)	39.5*** (37.7)	39.5*** (37.7)	39.6*** (37.8)	33.9*** (32.0)	29.8*** (28.2)

* Significant at 5% level ($p < .05$).

** Significant at 1% level ($p < .01$).

*** Significant at .1% level ($p < .001$).

^a There are seven industry binary variables in the dataset, the omitted variable is the binary for the Mining industry.

consistent with funding gaps research more generally (Colombo and Grilli, 2007; Cressy, 1996; Stiglitz and Weiss, 1981).

The regressions we report in Table 2 were run on a subset of the data in which we removed outliers beyond three standard deviations above and below the mean so our primary results would reflect the general population, not the extreme values on both ends of the distribution. We validated the results without outliers, comparing them with those of the complete dataset and found them substantially similar, with the exception of our findings regarding the impact of paid in capital squared on revenue and on assets (our models of growth: Models 1 & 2), where the coefficients move from negative and significant without outliers to positive and significant with outliers. These findings, summarized in Table 3, suggest that a power law (Crawford et al., 2014) may exist – i.e. the impact of paid in capital on growth diminishes for the central 6 standard deviations, but that for the outliers with the most successful exits, more cash meaningfully fuels even more extraordinary growth. Table 3 presents the coefficients of paid-in-capital squared with and without outliers for the two models in which the results were changed.

Table 3
Comparison of regression coefficients without outliers and with outliers.

	Model coefficient from sample with outliers removed (model R squared)	Model coefficient from full sample (model R squared)
(Paid in capital) ² on revenue (Model 1: growth)	-.254** (12.3%)	.69*** (69.7%)
(Paid in capital) ² on assets (Model 2: growth)	-.203** (20.3%)	.364*** (53.0%)

Some 415 of the ventures in our dataset were acquired for an amount less than the total paid-in-capital the venture had received over its existence. As these observations may represent graceful exit instead of profitable harvest, we validated our results against a model that excluded these “graceful exit” observations. A number of our findings regarding the diminishing returns on capital significantly changed when we analyzed only profitable harvest ventures. The paid-in-capital squared term for Price (Model 4), Cash Out (Model 5) and Profit (Model 6) lost significance, and significantly reversed sign for Growth (Model 1). From these differences, we make the inference that for ventures that are ultimately acquired at a profit, the diminishing return to additional paid-in-capital is not as strong as for the population of private firms acquired by public firms, and capital significantly accelerates growth in one of our two models that analyze growth (Note: we appreciate a reviewer calling this analysis to our attention).

Ventures with smaller amounts of equity invested made up an important subset of our sample (Fig. 1). Data indicate that 33% of entrepreneurs in our sample founded ventures with \$50,000 or less in total paid in capital and 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 empirical data which indicate that business owners and the self-employed report a relatively high median net worth of \$176,000 (Cagetti and De Nardi, 2006:840 Table 4).

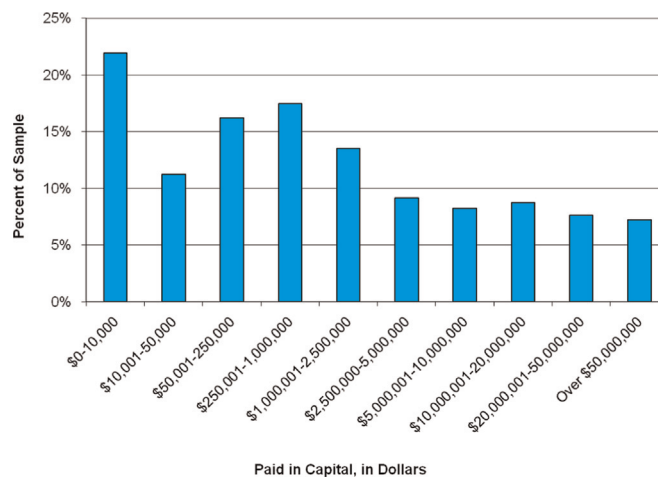


Fig. 1. Distribution of paid in capital.

Table 4
Comparison of paid-in-capital coefficients with and without “Graceful Exits”.

Variable	Model 1: revenue (growth)	Model 4: price	Model 5: cash out (returns)	Model 6: profit (returns)
Reported Model (paid in capital) ²	-.254**	-.273***	-.268***	-.280***
No “Graceful Exits” (paid in capital) ²	.241**	-.131	-.140	-.155

Mean exit valuation (Fig. 2) was \$48 M. The bottom 31% of our sample were acquired for less than \$5 M with more than half of those garnering valuations of more than \$2 M. Bringing price, paid in capital and venture lifetime together in Fig. 3, we provide a visual summary of the complete set of exits observed in our sample. These findings suggest an important trade-off 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 upon exit (which decreases as more equity is invested in these ventures). We split our data using the Retained Earnings and Paid in Capital variables to contrast the high equity strategy (which we refer to as “Burners”, using capital in order to achieve growth and exit) against the low equity strategy (referred to as “Earners”, focusing on revenue growth, asset growth and exit value over the long run).

Table 5 provides detail on the differences between Earners and Burners for the variables of this study. Earners fund growth with money from sales revenue, rather than equity capital investment. Earners produce a mean of \$3.9 M in retained earnings prior to being acquired, and raise a mean of only \$95,001 in invested capital, while burners accumulated losses averaging \$15.6 M prior to being acquired, and raised \$25.1 M of invested capital. The consequences of invested capital are material and significant. First, the burners took only 7 years from incorporation to acquisition, while the earners took 13.4 years, but revenues of the two groups at the point of acquisition were comparable (not statistically different) at \$25.5 M and \$20.3 M respectively. Thus, invested capital accelerated burners' growth and time to exit, without positive impact on returns or profit to the entrepreneur.

Burners grew and exited faster, but their overall use of capital significantly reduced their rate of return. As a group, Burners produced an ROIC of 12.6% relative to Earners at 50.7%. This ROIC calculation accounts for the difference in time to exit, higher level of total cash out at exit (Burners: \$58 M vs. Earners: \$24 M), and paid in capital. It assumes that all cash returned from a venture goes equally to the providers of the invested capital, and does not account for special distributions to ‘sweat equity’ holders, or debt repayments, which likely overestimates the returns to Burners relative to the Earners.

We analyzed average deal profit dollars (net of sales price less paid in capital) for each year the venture existed to gauge the net profit to the entrepreneur for each year participating in the venture. In nominal terms, Burners averaged \$8.3 M/year, reflecting their quicker pace to exit, compared to Earners at \$1.8 M/year. However, with Burners' average paid in capital of \$25 M, we assume the presence of outside investors such as business angels and VC, which reduce the entrepreneur share of proceeds based on post-financing equity share. Data on the equity share of entrepreneurs in each venture was not available for our data. We therefore assumed that the post-money share of the entrepreneur (or founding team) is 20%, in which case Burners delivered around \$1.7 M/year to the entrepreneur, less than 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).

6. Discussion

A great deal of prior research on entrepreneurship has focused on venture growth as a key dependent variable of interest – it represents one of our most common measures of “success”. Davidsson et al. (2009) argue that an unintended consequence of the focus on growth is that it contributes towards a presumption that growth is a good thing in itself, and

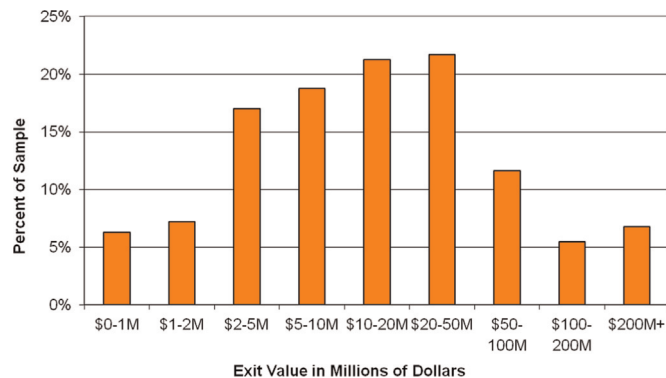


Fig. 2. Distribution of exit value.

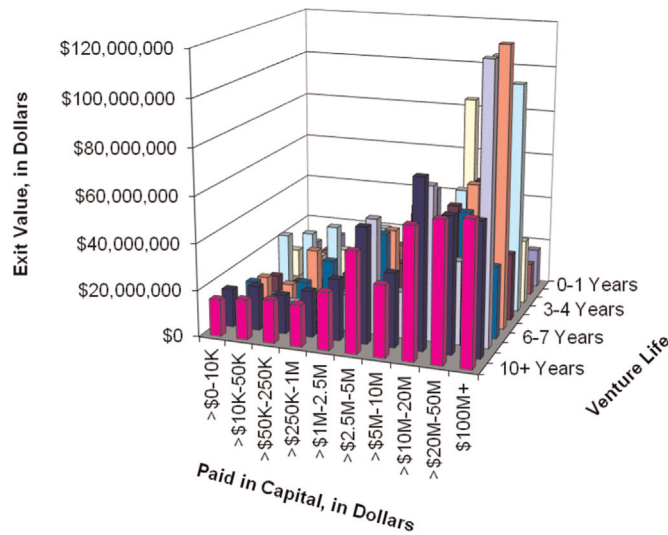


Fig. 3. Exit value with respect to paid in capital and years of venture life.

Table 5
Group comparisons of burners and earners.

	N=598 Burners	N=552 Earners	Test of significant difference
Inc year	1994	1986	.000
Seller population	16,919,799	11,163,727	.000
Exit year	2001	2000	.000
Tech bubble	.25	.12	.000
Exit VC activity (Ms)	289.0	155.0	.000
Founding VC activity (Ms)	240.7	114.6	.000
Same state	.31	.27	.110
Shareholder's equity (Ms)	-6.69	4.07	.000
Assets (Ms)	17.90	15.80	.660
Revenue (Ms)	25.65	20.25	.270
Retained earnings	-15,580,381.00	3,851,361.30	.000
Paid in capital	25,122,311	95,001	.000
Total cash out	58,161,202	23,538,437	.000
Years	7.0	13.4	.000
Avg. growth rate (%)	365.9	150.7	.040
Deal profit dollars	31,309,470	23,444,675	.160
Return on capital (%)	12.6	50.7	.020

therefore to a presumption in favor of variables that contribute to venture growth, including large influxes of investment capital, frequently channeled through venture capital firms. Our study confirms that equity investment is a significant driver of growth (Fig. 4).

However, 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 understanding of the returns among ventures that are not funded with large capital injections, those enterprises that grow at a slower pace than the more prominent “gazelles” (Acs and Mueller, 2008). While research investigating growth would tend to encourage entrepreneurs to seek out venture capitalists and fund acceleration with equity capital, our study highlights questions about optimal strategies for entrepreneurs concerned with total rewards over the long run. We already know that over 75% of venture capital funded entrepreneurs end up with nothing (Hall and Woodward, 2010). But after accounting for the closures/failures is the entrepreneur better off with VC financing? In a success sample of IPOs, Florin (2005) found that VC financed entrepreneurs

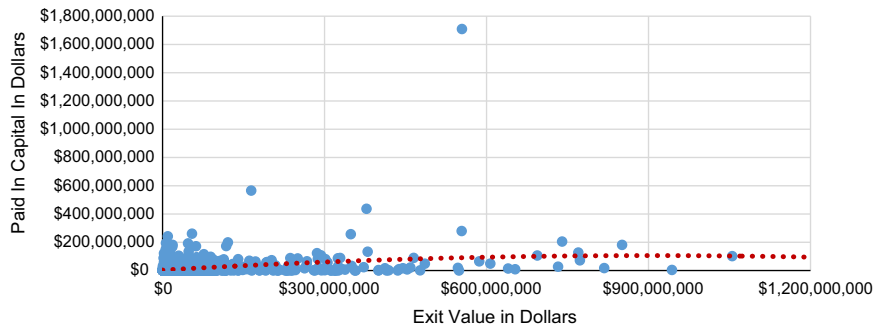


Fig. 4. Plot of paid in capital against acquisition value (with regression line overlay).

generated, on average, significantly less wealth for themselves and were much more likely to be fired from the ventures they started. Our work, together with these prior studies, exposes a need to paint a more complete picture of the rewards to different entrepreneurial financing strategies. We highlight that a set of firms in our sample (Earners) appear to follow a strategy of patient entrepreneurship, perhaps akin to the quintessential patient investor-Warren Buffett. These “Earning” ventures grow over time through revenue and retained earnings instead of outside money. This “Earning” strategy, regardless of whether it is motivated by sociocultural or economic factors (Osei-Assibey, 2010) has several potential benefits – control being a key example – as described in the strategies of the fat or sleek (Hvide and Møen, 2010). Developing this line of work and connecting it back into the economics stream that posited the connections between equity capital and entrepreneurial value in the first place offers excellent potential for improving the conversation in the field.

7. Conclusion

Our main limitation forms the basis of conclusion. We acknowledge that analyses of private ventures that successfully sold out to public acquirers may not generalize outside that class of ventures. However, given the level of conjecture, assumption and real economic activity around equity capital and entrepreneurial ventures, combined with the dearth of data on entrepreneurial exit and the great difficulty in gathering a substantial dataset, our data add much to the current state of the conversation. Specifically, our data point to areas where future research might focus on a more detailed understanding of the financing strategies of ventures, in particular the trade-off between speed to exit and return on equity invested, and the instrumental relationship between financing strategy and the objectives of entrepreneurs. The implications of these findings therefore touch entrepreneurs seeking to optimize the return on their equity invested, new venture investors, policy makers seeking to influence venture growth, and researchers working at the intersection of startups and finance.

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