

**SELECTION AND RETURN IN ANGEL INVESTMENT**

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There are wide discrepancies in estimates of returns to investors in entrepreneurial ventures. While the NVCA numbers show between 20 and 22 percent ROI per annum, recent studies such as the one by Chen, Baierl and Kaplan (2002) suggest the number may be closer to 13.5% -- well below the performance of the S&P 500. Reliable data on more informal investors such as angels is very hard to come by. But all available information, such as it is, points to the existence of substantial differences between returns to formal and informal investors. For example, Mason and Harrison (2002: pp 233) state that, "Comparison with the returns profile of early-stage venture capital funds suggests that business angels have fewer investments that lose money, a higher proportion of poor to moderately performing investments, and a similar proportion of high-performance investments."

What would explain such discrepancies? Currently, our attempts to gather data on this rather important phenomenon of entrepreneurial risk capital is almost entirely uninformed by theory. While we surmise that VCs use some kind of a portfolio diversification approach to investing based on rigorous business planning and well-researched financial forecasts, the prevailing theory of angel investing consists mostly of hand waving about their inability to diversify. It is in this regard that we hope to make a contribution to the extant literature.

In this paper, we argue that the decision processes used by angels and VCs differ in their cognitive content and overall logic, and that this difference impacts their returns differentially. More precisely, while VCs tend to use a causal approach based on predictive rationality, angels are more effectual and make their choices based on the logic of non-predictive control. This suggests a primary hypothesis for differentials in returns to the two types of investors – i.e., the theory of effectuation predicts that while angels may or may not obtain a higher overall rate of

return than VCs, they will obtain a higher hit rate (proportion of investments that survive and succeed).

In section 1, we will begin by reviewing extant theories of private equity markets. In section 2, we will summarize the empirical results on both VCs and angels, particularly with regard to how they make investment decisions. In section 3, we will state and argue for our primary hypothesis that while VCs use a causal approach based on the logic of prediction, angels are more likely to use non-predictive approaches based on effectual reasoning. In section 4 we will outline our method and data collection procedures to test this hypothesis. Finally, we will present some preliminary results (based both on previous empirical work and our prospective study) and discuss limitations and implications for future research.

## **1. Review of extant theories of private equity financing**

In a comprehensive review published in a special issue of the Journal of Banking and Finance, Berger and Udell (1998) cite paucity of data as the main reason why private equity financing of entrepreneurial businesses has until very recently been one of the most under-researched areas in business. While collection and availability of data has since been improving, research in this area is still very nascent and theory development is particularly sparse.

Key theoretical work of some relevance to our study and the general direction of the conversation flow on the subject is summarized in Table 1 and examined in greater detail here:

### Small business financial growth cycle and the moral hazard problem

Several authors and practitioners (Pratt and Morris, 1987; Sahlman, 1990; Wetzel Jr., 1994; Berger and Udell, 1998) have theorized that an entrepreneurial firm goes through a financial growth cycle that evolves over its age, size and transparency of information. In the

earlier years, when it is smaller in size and relatively unknown, it relies on insider funding (including angel financing) and gradually is able to attract external funds (such as bank debt and VC financing) as it grows. In other words, this theory suggests that angels are likely to finance firms at an earlier stage than VCs. One argument for this predicted relationship between internal and external funding has to do with moral hazard problems that might accrue in the case of high-growth, high-risk ventures where the external funding required relative to internal funds might be very large (Lewis and Sappington, 2000).

Using data from the Wisconsin Entrepreneurial Climate Study, recent empirical findings by Fluck et.al (1998), however, suggest a non-monotonic relationship between internal and external funds in the life cycle of a startup. According to their estimates, external funding exceeds internal at the earliest stages, declines as a proportion of total funding over a 7-8 year period, and then increases again in later stages. Based on a random sample of 794 VC-backed companies, Gompers (1995) also finds that, although early-stage firms receive significantly less money per round, VCs do concentrate investments in early-stage companies, particularly in high technology industries.

#### Adverse selection

Amit, Glosten and Muller (1990) have predicted a higher failure rate among VC-backed firms than the overall population of new firms. Their arguments are based on the adverse selection problem in the VC-entrepreneur relationship leading to VCs being unable to attract the high end of the spectrum of entrepreneurial ability. Instead the lower end will tend to select itself into VC funding, while the higher end bootstraps itself into IPOs and/or other more fertile types of investment harvests.

While some empirical evidence is found for this argument in the form of the low proportion of VC-backed firms in recent cohorts of IPOs, contradictory evidence is found by Gompers (1995) study of staged financing and Kunze (1990)'s reports of several practitioner accounts including the maxim that "lemons ripen faster than plums." We also find the argument rather unpersuasive for the following reason. The entire argument rests on the assumption that somehow, the entrepreneur has better information about his or her own ability to "make it happen" than the VC. Developing predictions based on the theory of effectuation, we will argue against this assumption in Section 3.

#### Non-excludability and the free rider problem

Anand and Galetovic (2000) argue another kind of problem that VCs face in selecting and harvesting entrepreneurial investments. In selecting entrepreneurial firms for their portfolios, VCs have to invest in costly information gathering efforts to weed out hi-potential firms from the others. But the information they so gather is non-excludable – i.e., that information is usually difficult to secure property rights over and may be appropriated by "free riders" who do not pitch in with the information gathering costs. The primary implication from their analysis has to do with the structure of the VC market. They predict and provisionally confirm that the VC market overcomes the free rider problem through cooperation between intermediaries, resulting in local monopolies and bilateral bargaining to set prices.

#### Agency problems in VC investments

Agency problems based on information asymmetries between investors and entrepreneurs has been widely discussed in the literature from Stiglitz and Weiss (1981) with regard to debt markets, through Myers and Majluf (1984) and Greenwald et.al. (1984) at the IPO stage, to Lewis and Sappington (2000) on early stage VC funding and governments seeking to privatize.

In all of these discussions, the issue of unpredictability at the level of the entrepreneur is completely ignored and it is tacitly assumed that the key source of uncertainty is largely due to agency problems arising out of the investors' ignorance of entrepreneurial ability. In our analysis we explicitly examine the situation when neither investor nor entrepreneur can predict their own product-market futures at any given level of ability. This examination leads us to recast the investor-entrepreneur relationship more in terms of a partnership for enactment and effectuation rather than primarily as a setting for agency problems.

#### Unpredictability and incomplete contracts (Hart)

The issue of unpredictability, arising both due to agency problems as well as due to the inherent uncertainties in entrepreneurial ventures, is investigated in more depth by Hart (2001) in a more general exposition of financial contracting. "We have seen that incentive (agency) problems alone do not yield a very satisfactory theory of financial structure. The recent financial contracting literature (developed in the last fifteen years or so) add a new ingredient to the stew: decision (control) rights." (2001: pp 1083)

This literature, Hart (2001: pp 1085) claims, has been focused on entrepreneurial firms (e.g. Aghion and Bolton, 1992; Kaplan and Stromberg, 2001) and has tried to answer questions such as, "How should the right to make future decisions be allocated between the entrepreneur and the investor?" and "Who should have the right to replace the CEO or terminate the project?" Optimal contracting of decision rights are particularly important when private benefits such as personal satisfaction, reputational enhancement, and other forms of psychic income are as important to the entrepreneur as cash flows or other financial measures of firm performance.

Hart's arguments move the conversation from agency problems on how to divide the proverbial pie that appears almost magically – i.e., in an entirely exogenous fashion to

managerial decisions -- to an emphasis on how and why managerial decisions and actions affect profitability and firm value. Hart concludes, "I have discussed how economists' views of firms' financial structure decisions have evolved from treating firms' profitability as given, to acknowledging that managerial actions affect profitability, to recognizing that firm value depends on the allocation of decision or control rights. I have tried to show that the decision or control rights approach is useful, even though it is at an early stage of development, and that this approach has some empirical content: it can throw light on the structure of venture capital contracts and the reason for the diversity of claims."

We would like to move this conversation further to take into account some details of how these decisions and actions by entrepreneurs actually affect not just the profitability or market value of the firm, but the very creation of the markets (both product and factor markets) that make such value possible. Our understanding of these relationships between entrepreneurial action and market creation has implications for the role and performance of angels and VCs in early stage financing of entrepreneurial ventures. Before we proceed to our main argument, however, we would like to summarize what we empirically know about how VCs and angels make their investment decisions and how they perform on those decisions.

## **2. VC and angel investments: Summary of empirical results to date**

What do we know about the two main types of equity markets for entrepreneurial ventures? While considerable information is collected by the VC industry on how venture capitalists operate and perform, the market for angel capital as Prowse (1998) puts it, "operates in almost total obscurity." According to estimates by Freear et. al. (1996), 250,000 angels invest between \$10 billion and \$20 billion in approximately 30,000 firms annually. In other words, the

angel market is several times larger than the VC market where commitments in 1995 totalled \$6.6 billion for less than 1,000 ventures.

Furthermore, the following facts are estimated about the angel market by Prowse (1998):

- Angels are extremely diverse in their backgrounds, sources of their wealth, and financial sophistication
- Not all angels are “active” investors
- Most angels, particularly the ones who have themselves been entrepreneurs, prefer to focus on startup or infant stage firms.
- Most angels typically invest only in one or two firms a year and do negotiate both financial and governance issues very carefully.
- Most angels invest “close to home” – i.e., their deals are generated through rather primitive and informal networking arrangements with friends, family, and other angels.
- Most angels tend to insist on previous personal knowledge of the entrepreneur and consider business plans secondary to their own knowledge about the proposals and comfort levels with the entrepreneur. In fact, angels routinely reject “promising” proposals due to lack of first hand knowledge of the venture concept and principals.

As Lerner (1995 and 1998) and Fenn et.al. (1995 and 1997) document it, venture capitalists differ from angels both in search and selection of investments in their portfolio. They incur considerable costs in search and selection and then underwrite significant efforts in developing and administering mechanisms that overcome potential agency problems and monitor performance of each investment in the portfolio.

In a more recent empirical study of the differences between angels and VCs, Mason and Harrison (2002) contrast the two types of investors in terms of their approaches to investment



appraisal, due diligence and contracting as follows: *Many of these arise because business angels, unlike venture capital fund managers, decide on the worth of a potential investment as principals, rather than as agents and/or employees (Feeney et.al., 1999; Prasad et. al., 2000). Business angels are less concerned with financial projections and are less likely to calculate rates of return. They do less detailed due diligence, have fewer meetings with entrepreneurs, are less likely to take up references on the entrepreneur and are less likely to consult other people about the investment. Conversely, business angels are more likely to invest on 'gut feeling'.*"

As stated at the beginning of this paper, Mason and Harrison (2002) also find that 23% of angel investments show an IRR of 50% or more with 34% exiting at a loss and 13% at break-even or partial loss. Combining their own surveys with those of Murray (1999), the authors also suggest that the comparative rates for VCs are 64% exiting at a loss and 21.5% with an IRR of 50% or more. Cumulative returns for VCs had been estimated by Bygrave and Timmons, (1992: pp 153) at below 20% with the distribution described as, "rather than the folklore figure of 30% to 50%, actual VC returns have most often been in the teens, with occasional periods in the 20% to 30% range and rare spikes above 30%." A more recent study by Chen, Baierl, and Kaplan (2002) based exclusively on 148 completely liquidated funds (unlike previous studies based on reported values of unliquidated funds) finds that the cumulated average for those VC funds is 13.38%.

In the next section, we will examine whether there could be a relationship between the key differences in how angels and VCs make their investment decisions (based on careful search and monitoring processes involving explicit mechanisms to overcome agency problems on the part of VCs, and the surmised 'gut feeling' close-to-home approaches used by angels) and the differences in their performance. In particular, we will argue that there are theoretical

underpinnings to these differences, based especially on causal versus effectual approaches to dealing with Knightian uncertainty in the creation of entrepreneurial ventures and their new markets.

### **3. Causal versus effectual approaches to early stage equity investments:**

#### **The primary hypothesis**

Current theories of investment (early stage or otherwise) are based on assumptions of exogenously determined distributions of future returns that may be unknown, but knowable in theory, if only complete information (up to the moment of decision) on all determinants were available *ex ante*. Risks associated with such uncertain distributions, therefore, are also calculable in some theoretical sense, however low our confidence in those calculations may be. In other words, by positing a universe of all possible futures, we can place certain careful bets and/or devise predictive strategies that help us choose wisely in the face of uncertainties about the future. Within such a world view, portfolio diversification and the maximization of NPVs of future cash flows are the predominant theories that inform our research and practice. And since diversified portfolios are of overarching importance, agency problems due to opportunistic behavior on the part of portfolio companies attract the most theoretical attention in our investigations.

However, if we challenged our assumptions about the uncertainties that characterize future outcomes, we might find other avenues of research that might better explain the phenomena we are interested in. And Knightian uncertainty (Knight, 1921) provides just such a challenge to our assumptions. It consists not merely in the notion of unknown future distributions, but in an *unknowable* future that just simply cannot be predicted, however

complete our knowledge up to the moment of decision. Effectual reasoning (Sarasvathy, 2001a) takes that one step further and posits a future that gets created (at least partially) as a direct endogenous result of the very decisions that key stakeholders in the process make. If the decisions entrepreneurs and investors make directly help create the probability distributions on which they are placing their bets (or over which they are diversifying their portfolio), we have something of the equivalent of an Heisenberg-type uncertainty principle at work in early stage investment decisions.

Furthermore, there is considerable empirical evidence that expert entrepreneurs act in the belief that the future they face is characterized by Knightian uncertainty as opposed to an analyzable or at least theoretically estimable/predictable one. There is also evidence that in overcoming this “true” unpredictability, expert entrepreneurs use non-predictive strategies based on the effectual logic of control (Sarasvathy, 2001b). These strategies consist in three broad categories, each of which is an inversion of causal/predictive approaches to dealing with uncertainty:

#### Affordable loss (Zero resources to market)

The affordable loss principle of effectuation suggests at least three strategies: (1) To invest only to the extent one can afford to lose; (2) To imagine creative ways to get things done with zero resources; or to work one’s way up from the cheapest to the highest affordable options; and, (3) To prefer options that open up multiple future options rather than to maximize myopic short term returns (variations on real options logic). Instead of beginning with a predictive plan and investing “what it takes” to implement it, affordable-loss logic suggests that the entrepreneur/investor should imagine and implement ways to get things done for no (or very minimal) resources and then iteratively refine their strategies as they create the market and the

firm. Effectuation based on affordable-loss does not segment new venture creation into planning and implementation. Instead it emphasizes iterative learning-by-implementation, adding predictive planning as the firm increases in size and grows its market over time, until eventually it reaches an inflection point where causal and effectual processes balance each other to sustain both firm and market for predictable periods of time.

Based on extant data on VCs and angels, it may be reasonable to suppose that VCs do tend to invest in particular plans with specific milestones and aim to implement the plan to maximize their returns. Angels, on the other hand, invest only in what they know and what they can afford to lose and remain more willing to change plans as nascent markets coalesce and firms begin to grow. For example, in a recent survey conducted by Dee Power and Brian Hill and reported in Angel Investor News, when asked, “What rate of return do you expect for your investments made as an angel investor?”, several angel investors said they “wrote off the investment mentally as soon as it was made.”

### Partnerships

The partnerships principle allows the effectuator to shape and control the environment rather than predict changes in it. This principle also serves to create locally stable pockets of cooperation within a globally competitive environment. Effectuators therefore are the primary agents who imagine and implement “conceptions of control” (Fligstein, 2001) that constitute the stable social structures on which all markets are built. These partnerships allow effectuators to proceed with market creation without wasting resources on trying to predict it. In other words, the partnerships principle rests on the assumption that markets are not entirely endogenous to the entrepreneurial firm creation process.

While evidence suggests that both VCs and angels create effectual partnerships to deliver parts of the future as imagined by the founders/investors, there is some evidence to suggest that angels allow the partnerships to dictate how and where the market will come to be rather than let predictions of exogenous markets to guide selection of partnerships. In other words, angel investors allow more *effectual* partnerships to happen than VCs who focus on more *strategic* partnerships. For example, Prowse (1198: 790) states, “Other control mechanisms used in the organized private equity market, such as covenants preventing mergers, asset sales or entering into long-term contracts without outside investor approval, appear rare in the angel market.”

#### Leveraging rather than avoiding contingencies

Since effectuators do not believe that the future is “out there” to be predicted and harvested, and instead visualize several possible futures that could be at least partly *created* by their own actions and the actions of key stakeholders, they need to develop strategies that build on the unexpected than strategies that avoid surprises. In other words, effectuators do not merely *adapt* to changes in the environment; they often *negotiate* with the environment for favorable changes (partnerships principle) and where they cannot negotiate, learn to *leverage* changes into opportunities they could not have imagined *ex ante* (i.e. before those changes happened).

This implies that effectuators have a very different attitude to failures. Instead of viewing success/failure as a 0-1 variable, effectuators tend to *manage* a variety of successes and failures. This means considering success a process rather than an event in the history of the firm. The success process consists in outliving failures (several with a small “f”) and cumulating successes (with a small “s”) over time, rather than avoiding Failure (with capital “F”) and achieving Success (with capital “S”) at any one given point.

Some evidence for the effectual nature of angel investor decisions exist. As Prowse (1998: 790) reports:

“... unlike in the organized private equity market, many angels are content to take common stock. Also unlike the organized private equity market, angels rarely use management employment contracts that penalize managers for poor firm performance, for example, by specifying conditions under which management can be replaced and including buyback provisions that allow the firm to repurchase a manager's shares in the event he is replaced.”

### **The primary hypothesis**

Existing evidence on angel investors, however fragmented and inadequate, suggests that they routinely use some of the key principles of effectuation. Similarly, existing evidence on VCs suggests that they prefer causal decision making at least to a larger extent than angels do. This implies a primary hypothesis for the differences between the two types of investors. The hypothesis, stated below, is based on one of the key predictions of the theory of effectuation – i.e., that irrespective of the overall *probability* of success and any effects on the rate of returns, effectuation reduces the *costs* of failure.

Hypothesis: Angel investors will achieve a higher hit rate than VCs, hit rate being the proportion of surviving firms to defunct ones over some reasonable period of time, say eight years.

## **4. Method and Data Collection**

To test the central hypothesis stated above, we plan to collect data from over 8,000 angel investors in the Pacific Northwest region of the United States. We have developed a preliminary survey instrument that is attached in Appendix 1. This survey will allow us to calculate key descriptive and evaluative statistics including the hit rate. Furthermore, we will estimate rates of

return for this angel sample using methods very similar to Mason and Harrison (2002). We will then compare both the hit rate and rates of return with published rates for VC, based on data collected and analyzed by Venture One, and the NVCA.

Since preliminary results indicate that the hypothesis will not be rejected, we plan to confirm this provisional support for the hypothesis through a scenario/protocol analysis study of approximately 20 VCs and angels on whether and to what extent they use causal versus effectual reasoning in their investment decisions.

## **5. Results and Discussion**

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**Table 1**

Investors do not know entrepreneur's ability

Informational Asymmetries and Agency Problems in early stage financing:

- No one will fund early stage entrepreneurial firms because of moral hazard problems -- so they have to depend on internal funding. (summarized in Berger and Udell, 1998)
- The ones that do get funding will not be the best ones because of adverse selection problems (Amit, Glostten and Miller, 1990)
- When VCs do manage to discover a hi-potential entrepreneurial venture, they will face a free rider problem from other VCs due to non-excludability of the information (Anand, 2000)



Investors do not know entrepreneur's motivation

The argument from incomplete contracting

The above theories are incomplete because they all assume both investors and entrepreneurs are motivated by the same thing -- i.e. cash flows (Hart, 2001)

But when "private benefits" other than cash flows matter to the entrepreneur, decision (control) rights become extremely important.



Entrepreneurs do not always know their own ability and motivation

Our argument: All agency problems ignore Knightian uncertainty

Not only are investors ignorant of entrepreneurial motivation and their ability to deliver the future, entrepreneurs themselves are often unsure either of their own motivation or ability in the face of Knightian uncertainty.

Thus decision (control) rights matter, but they matter not in the sense of causal agency, but in the sense of an effectual partnership between investor and entrepreneur

## Appendix 1