

Effectual Logic in Early-Stage Venture Capital Decision-Making

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ABSTRACT

Effectuation is based on a distinctive logic inverting several key principles that are central to the rational choice paradigm. Empirical studies have shown expert entrepreneurs and some angel investors employ effectuation to tackle uncertainty in decision-making. Early-stage venture capital investment is fraught with high uncertainties and ambiguity with a high rate of failure. Meanwhile it is noteworthy that persistent research endeavours in developing predictive VC decision models are not satisfactory either. This conceptual paper argues that effectuation provides an alternative perspective which may be significant to investigate early-stage VCs' decision behaviour. Several important propositions are developed, followed by implications for future research.

Keywords: entrepreneurship, new venture finance, venture capital, effectuation, strategic decision-making

INTRODUCTION

The VC task is one that requires decisions be made in a highly uncertain environment, placing a strain on information processing capabilities and involving high levels of emotion and extreme time constraints. (Andrew L. Zacharakis & Shepherd, 2001: 314)

Venture capital (VC) is important to entrepreneurship development (Arthurs & Busenitz, 2003). Extensive VC research has attempted to examine factors important to VC decision-making (Andrew L. Zacharakis & Shepherd, 2001) or to develop models predicting venture capitalists' (VCs) decisions to invest. The underlying assumption is that even under high uncertainty, VCs attempt to predict ventures' future outcomes using information contained in the business plan (e.g. Roure & Keeley, 1990).

Based on the development stage of a venture, VC financing can be generally specified as early-stage, expansion, or pre-IPO (Haemmig, 2003). These stages are depicted in Figure 1, which is adapted from Haemmig (2003: 29) and Timmons & Spinelli (2009: 427).

Insert Figure 1 about here

As shown in Figure 1, early stage refers to the time period before the venture achieves break-even. It encompasses the start-up and early growth periods. The financing requirement is especially vital for companies in this stage. To make matters worse, the faster the new ventures grow, the more capital they

need. Cash flows out for a long time before it starts flowing in. This phenomenon is at the heart of the financing challenges facing early-stage ventures (Timmons & Spinelli, 2009).

However, early-stage VC financing is particularly risky as it is fraught with high uncertainty and ambiguity (Afuah, 1998; Garud & Van De Ven, 1992), because early-stage ventures may have not yet created a product with stable revenue streams and could suffer from the liability of newness in organizational development (Choi, Levesque, & Shepherd, 2008). In addition, there are at least two challenges aggravating uncertainty in early-stage VC decision-making. The first is information asymmetry between VCs and entrepreneurs (Gans & Stern, 2003) that cannot be sufficiently overcome by economic mechanisms such as allocation of contractual rights, the staging of capital, and risk shifting (Shane & Cable, 2002). The second is information overload (Stevens & Burley, 1997), which challenges human cognitive capacity.

Zacharakis and Shepherd (2001) find that VCs are over-confident about their prediction ability. Zacharakis & Meyer's (1998) study shows VCs might not really understand their own decision process. These findings may explain why persistent endeavours in developing predictive VC decision models are not satisfactory and why strong heterogeneity has been found in VC decision-making criteria. Not surprisingly, many studies (e.g. Fiet, 1995; Mason & Harrison, 1999) have highlighted that securing VC financing is one of the central challenges for early-stage ventures due to high environmental uncertainty.

Recent literature on entrepreneurial expertise (Read & Sarasvathy, 2005) suggests that expert entrepreneurs tackle uncertainties related to new ventures using effectual reasoning, which relies on the logic of control instead of prediction. Put simply, while entrepreneurs perhaps believe that having systematic plans (at least in their minds) is necessary for venture development, environmental changes and uncertainties create situations where unexpected outcomes occur. To survive, entrepreneurs need to be resourceful and make do with resources at hand rather than what they may *have hoped to ideally have* to develop their ventures. With this approach, there is a reduced reliance on *systematic* acquisition and

analysis of information because of environmental, time and resource constraints. In entrepreneurial settings where uncertainty is the norm, markets may not exist currently and opportunities may not be recognized but created. It is in such situations where effectual logic is especially relevant for decision-making (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003).

Research has shown that expert entrepreneurs refuse to trust predictions for decision-making under uncertainty (Dew, Read, Sarasvathy, & Wiltbank, 2009; Read, Dew, Sarasvathy, Song, & Wiltbank, 2009). An early-stage VC would more likely prefer investing in a venture managed by an expert entrepreneur instead of a novice. Compared with entrepreneurs of early-stage ventures, VCs probably face more uncertainties in determining whether they should or not invest in an early-stage venture. Thus, if effectual logic applies to entrepreneurs, we argue that it may also apply to early-stage VC investors.

This conceptual paper proceeds as follows. First, we begin with an overview of the effectuation literature followed by a discussion of the problem space and the role of control in early-stage VC decision-making. Second, drawing upon the expertise literature and effectuation theory, we argue that early-stage VCs will use effectual logic in performing decision tasks and expert early-stage VCs are more likely to emphasize effectuation than novices do. Third, we focus on how the three distinctive principles of predictive rationality may be inverted by early-stage VCs. Through these, we illustrate why and how effectuation is applicable for early-stage VC investment domain. Fourth, we develop propositions about these underlying principles. Fifth, we discuss the implications of this study for future research.

LITERATURE REVIEW

Effectual logic or effectuation (S. D. Sarasvathy, 2001) is a specific logic about decision-making under uncertainty. The theory of effectuation inverts several principles that are central to the rational choice paradigm. The management literature based on predictive rationality holds that control over outcomes can be derived from predicting an organization's environment which can lead to positioning the organization in a predicted future state to succeed: To the extent you can predict the future, you can control it (S. D.

Sarasvathy, 2001). In contrast, effectuation is a logic of non-predictive control: To the extent we can control the future, we do not need to predict it (S. D. Sarasvathy, 2001).

In seeking to clarify what effectuation is (and what it is not), Dew and Sarasvathy (2002: 3) state that:

Although the effectuation lens gives researchers a distinctive point of view on entrepreneurial action, it builds on the work of many leading management theorists such as March and Weick by providing an integrating logic at the level of individual decision-making. The logic of effectuation also promises to be useful in other research domains including economics and strategic management.

In order to examine the applicability of the effectual logic in early-stage VC decision-making, we will first examine the problem space.

The Problem Space of Early-Stage VC Decision-Making

According to Sarasvathy, Dew, Read, & Wiltbank (2008), the problem space of effectuation consists of three elements: the unknowable uncertainty (Knight, 1921); goal ambiguity (March, 1982); and environment isotropy (Weick, 1979).

Sarasvathy (2008) asserts that if decision makers believe they are dealing with a measurable or relatively predictable future, they are motivated to gather information systematically and conduct reasonable analysis. If they see themselves dealing with relatively unpredictable situation, they will try collecting information through experimental and iterative learning techniques aimed at first discovering the underlying distribution of the future.

The unknowable uncertainty of early-stage VC decision-making

According to Knight (1921), uncertainty can be categorized into three types: the known - the distribution of outcomes is known though the draw is unknown; the unknown - both distribution and draw are unknown; and the unknowable – the distribution of outcomes does not exist ('Knightian uncertainty'). The reason of being unknowable is 'the lack of valid basis of any kind for classifying instances' (Knight, 1921: 225). VCs' decisions to invest in early-stage ventures are confronted by high levels of risk, uncertainty

and ambiguity (Afuah, 1998; Garud & Van De Ven, 1992; Manson & Harrison, 1994; Stevens & Burley, 1997). We have discussed this in the introduction section of this paper.

Goal ambiguity of early-stage VC decision-making

Goals exist in hierarchies (Simon, 1964). Although a VC may possess a clear objective at the highest level as achieving optimal rate of return for the investment portfolio, the operationalizations at lower levels may be highly ambiguous. Take for example the goal of a VC who may want to make \$100 million in 10 years for the fund. This 'goal' may appear specific and clear, but it may not be easily translatable into immediate sub-goals to act upon. In other words, the goal does not necessarily provide a compelling reason for the VC to commit to any particular venture, new product or matter.

For a VC having made an investment decision, even if we accept as fact that from day one the person 'sees' the opportunity and clearly wants to co-build an online business of some sort with the entrepreneur, the VC might not be sure whether the business would eventually be able to command revenue from membership, advertisement, broking services, or something in between for which there are no clear models. Therefore, a high level of goal ambiguity still remains.

Environment isotropy of early-stage VC decision-making

Environment isotropy means it is unclear what elements of the environment to pay attention to and what to ignore (Dew & Sarasvathy, 2002). VCs need to rely on a venture's performance factors or indicators to predict its success. However, most of these factors are intangible and difficult to measure. Moreover, the functioning mechanism and interactions among the factors may be too complex to human cognitive capacity. Kunze (1990) argues that if VCs have fully analysed every potential deal, they would never fund any ventures. In essence, the more analysis is made, the more reasons will be found as leading to the venture failure or paralysis by analysis (Andrew L. Zacharakis & Shepherd, 2001). Early-stage VCs may not know exactly what elements of the environment to pay attention to and what to ignore.

As illustrated above, early-stage VCs' decision-making encompasses all three elements of the effectuation problem space. While portfolio diversification strategy may be appropriate for dealing with the problem of non-existent distribution (C. H. Coombs, 1975; C. H. Coombs & Huang, 1970), it is not a real solution to the problems of Knightian uncertainty (Dew & Sarasvathy, 2002). In such contexts, we would like to ask the same question about early-stage VC decision-making, originally brought up by (Sarasvathy & Simon, 2000: 4):

Where do we find rationality when the environment does not independently influence outcomes or even rules of the game (Weick, 1979), the future is truly unpredictable (Knight, 1921), and the decision maker is unsure of his/her own preferences (March, 1982)?

Role of Control in Early-Stage VC Decision-Making

Effectuation presents a new and viable theoretical lens for examining early-stage VCs' decision-making. This logic eschews prediction and emphasizes a more direct effort to control uncertainty (Saras D. Sarasvathy, 2001). Goodie (2003: 598) defines control as:

...the characteristic of probability alterability. That is, if a participant could take steps to favorably alter the success rate in subsequent administrations of the task (not in the current administration), then the task is said to be characterized by control.

Control involves actions which may construct entirely new event spaces under uncertainty (Wiltbank, Read, Dew, & Sarasvathy, 2009). In the context of early-stage VC decision making, two key aspects of control need to be examined: feasibility and efficacy.

First, legally VCs are entitled to exercise certain control over their portfolio companies since they are shareholders of the ventures (Fredriksen, Olofsson, & Wahlbin, 1997; Gifford, 1997). From the principal-agent perspective, VCs obtain control through structuring financial contracts to allocate cash flow and control rights and engaging information collection and monitoring in the project execution process (Kaplan & Stromberg, 2001). Furthermore, on the strength of rich market knowledge, expertise and valuable network, VCs can provide management support to new venture development on business

strategy, organizational professionalization and project execution (cf. Hellmann & Puri, 2002; Sapienza, Manigart, & Vermeir, 1996) and therefore enhance their control. Empirical evidence demonstrates that such activities can result in the funded ventures enjoying sustainable competitive advantages (Eldridge, 2007). Brander et al (2002) find that in relation to venture success, VCs' management support contributes more than deal selection.

Early-stage VC Investment Expertise

Expertise cannot be simply acquired from experience alone (Camerer & Johnson, 1991). The key is 'deliberate practice' (Ericsson & Simon, 1993), which occurs when an individual exerts high effort on the performance of activities that are highly relevant to performance within a specific domain (Deakin, Cote, & Harvey, 2006). (Dew et al., 2009).

Research has shown that the path to acquire entrepreneurial expertise is rooted in the cognitive systems created by deliberate practice (Dew et al., 2009). The authors further argue that reliably superior performance is an integral component for the acid test of expertise. Based on these rules, Dew et al. (2009) define expert entrepreneurs as persons who, either as individuals or as part of a team, have founded one or more companies, remained with at least one company that they founded for more than ten years and taken it public.

We believe that these rules apply to early-stage VCs too. For the purposes of this study, we define expert early-stage VCs as persons who, either as individuals or as part of a team, have more than ten years' early-stage investment (or equivalent) experience, invested in more than two early-stage companies and achieved at least one invested company being listed public or bought out profitably by other investors. In contrast to the experts, the novice early-stage VCs are those who have enough experience in basic business and investment knowledge and they could be associates or junior managers in institutional VC firms typically.

INVERSION OF DISTINCTIVE PRINCIPLES OF PREDICTIVE RATIONALITY

One potential major argument against the applicability of effectuation in VC decision-making is that VCs shall make decisions based on: expected return, competitive analyses, and pre-existing information, key principles which are central to predictive rationality. Dew and Sarasvathy (2002) highlight that by inverting these principles, however, decision-makers can take advantage of uncertainty and convert it into opportunity. We would like to put early-stage VCs into the perspective and explore the applicability of these mechanisms in their decision process.

Affordable Loss Rather Than Expected Return

Return and loss are the twins in VC decision-making. The model proposed by Tyebjee and Bruno (1984) views VC decision-making as a problem solving task evaluating both expected return and perceived risk. An early-stage venture investment is an opportunity characterized by a prospect of potential gain and loss. The key issue is which one goes first and which gains more attention. To calculate expected returns, VCs need to estimate future sales and potential risks that constitute the cost of capital. Early-stage ventures grow typically in the Knightian uncertainty. Not only the potential outcomes, but also the probability of losing or gaining, are often unknowable. Ruhnka and Young (1991) assert that even at a portfolio level which may consists a dozen of investments, the probability of a final positive or negative outcome for that portfolio cannot be projected with any degree of certainty.

Downside losses for a new venture include financial losses for an extended period of time, failure to reach breakeven, and, ultimately, the cessation of operations. Ruhnka and Young (1991) suggest VCs' screening of potential deals consists of two steps. First, VCs identify those ventures with an acceptable prospect of loss. Second, they try to identify the ones that carry the highest possible gain.

Wiltbank et al.'s (2009) study has shown that some angel investors do employ effectual logic in their investment decisions. In contrast to angel investors, VCs manage primarily other people's money. A fund's success and VCs' compensation are all directly linked to the realized rate of return. VCs typically

receive an annual fixed management fee (around 2.5% of fund capital) plus a variable portion which is a percent of the fund profits (20%) when investment returns are realized (the carried interest). This compensation structure is the most important contractual mechanism to align VCs' interest with their fund investors' and therefore, to treat the money as their own.

Given the above factors and the similar level of uncertainty involved in decision-making for angel investors and early-stage VCs, we posit these two groups of investors tend to behave similarly. VCs are motivated to work hard to achieve expected fund return. It is important to highlight that the return refers to the fund at the aggregate level instead of a single deal. Some VCs may refuse to invest in a venture until they predict it to be able to pay substantial return. In contrast, others may focus more on the affordable loss, limiting the exposure to downside potential and then seeking to enhance profitability by pulling in stakeholders' joint commitments and exerting control later on. In other words, some VCs ask about how much to gain first, then think about the risk. Some are first concerned about the downside and especially the worst-case scenario, then the upside. For the second type of VCs, they believe that success cannot be predicted when facing uncertainty but that the occurrence of failure can be significantly controlled (S. D. Sarasvathy, 2001). By taking action based on affordable loss rather than on predicted values, the risk involved in any one action cannot put an entire fund in jeopardy. Therefore, we propose that when making early-stage venture investment decisions:

1a. Expert VCs tend to place higher weight on affordable loss than expected return.

1b. VCs higher in early-stage venture investment expertise emphasize affordable loss to a larger extent than those lower in early-stage venture investment expertise.

Proposition 1a focuses on the comparison of the weight attributed to the two distinctive logics in decision-making by the same expert early-stage VC group of subjects. In contrast, proposition 1b involves both expert and novice early-stage VC groups and the focus is on the comparison of the extent to which these two groups apply effectuation logic in their decision making.

Pre-commitments from Key Stakeholder-partners rather than Competitive Analyses

No doubt, the full commitment of entrepreneurs is a prerequisite for early-stage VCs' decision to invest. Besides that, VCs may look for other key stakeholder-partners in activities such as to syndicate the investment. Deal syndication allows multiple VCs to take an equity stake in an investment for a joint payoff while sharing and reducing risks. Lerner (1994) finds syndication is common in the first round of investing. He argues it is a part of the screening process and VCs are more comfortable with a deal when other VCs of similar experience are willing to invest. The joint due diligence and investment capital put in the same deal is exactly key stakeholder-partner's pre-commitment.

Causal models emphasize systematic and even detailed competitive analyses by assuming the existence of a predetermined market. However, early-stage VCs may de-emphasize it because they do not hold such assumptions. Instead, they weigh more heavily the commitments shown by entrepreneurs and other key stakeholders including those whom the entrepreneurs brought on board or are connected with even before clarifying what exactly the product or market they are dealing with.

Such demanded pre-commitments help early-stage VCs reduce uncertainty by contracting along certain dimensions for the future. Through pre-commitments VCs together with the entrepreneurs and other partners, focus on creating new markets in the chosen image of their partners, rather than attempting to guess at structures of exogenous markets through predictive competitive analyses. With this mentality, VCs are more conducive to the expansion of network of stakeholder relationships to creates the path for the development trajectory of the venture and new markets. Hence, we propose that when making early-stage venture investment decisions:

2a. Expert VCs tend to place higher weight on pre-commitments from key stakeholder-partners than competitive analysis.

2b. VCs higher in early-stage venture investment expertise emphasize pre-commitments from key stakeholder-partners to a larger extent than those lower in early-stage venture investment expertise.

Contingent Knowledge rather than Pre-existent Information

The creation of new markets is fraught with incomplete information (Denrell, Fang, & Winter, 2003). First, consumer tastes are ambiguous, ill defined and continuously evolving in new markets (Sarasvathy, 2008). Even if we assume tastes reasonably stable, the ways of consuming the product or technology are changing. Put simply, there is no well-articulated demand or the market is not just 'out there' to be predicted. Even if we can treat demand as exogenous and relatively stable, innovation may create unlimited ways to meet the demand. If human beings' preferences enter the mix, the problem quickly becomes intractable (Sarasvathy, 2008).

In new technology commercialization, pioneering entrepreneurs often find that formal market research and expert forecasts, however sophisticated in their methods and impeccable in their analyses, fail to predict how the markets will be formed and where they could be (Sarasvathy, 2008). Therefore, some VCs may not strive to avoid surprises. They are more prepared to stand ready to make do with what comes their way. They recognize the importance of leveraging uncertainty by treating the arrival of contingencies as opportunity to exercise control of the emerging situation, together with other key stakeholder-partners. This leads us to propose that when making early-stage venture investment decisions:

3a. Expert VCs tend to place higher weight on contingent knowledge than pre-existent information.

3b. VCs higher in early-stage venture investment expertise will emphasize contingent knowledge to a larger extent than those lower in early-stage venture investment expertise.

DISCUSSION AND CONCLUSION

Dew and Sarasvathy (2002: 11-12) suggest:

The key to understanding and applying effectuation is to realize that it co-exists with rational choice and provides an additional set of tools to the decision maker. In fact, one of the most fruitful areas for future empirical work in this regard would consist in carving out the space and bounds for the use of these two very different modes of reasoning.

A person can use both causal and effectual logics at different times depending on what the circumstances call for (Sarasvathy, 2008: 73). Dew and Sarasvathy (2002) point out that both logics are integral parts of human reasoning and can occur simultaneously. Wiltbank et al. (2009) further assert that entrepreneurs and their investors are capable of both effectual and predictive logics and often use both in practice. We do not argue that early-stage VCs employ effectuation as a wholesale replacement for predictive rationality.

Early-stage venture capital investment is fraught with high uncertainties and ambiguity with a high rate of failure. Persistent research endeavours in developing predictive VC decision models are not satisfactory either. As illustrated, effectuation is based on a distinctive logic inverting several key principles that are central to the rational choice paradigm. For research purpose, it offers a comprehensive alternate frame for tackling early-stage VC decision problems. Referring to our propositions, we are concerned about not only which reasoning gains more emphasis from the expert VCs, but also how different in terms of the mentality and approach between the expert and novice VCs in their use of effectuation. Both types of our propositions have significant implications to not only VCs, but also entrepreneurs and even venture fund investors because they stand on the demand and supply sides of venture capital respectively. Majority of these stake-holders were trained in or significantly influenced by causal thinking. If the use of effectuation is correlated with the expertise of investing in early-stage ventures, all these related parties may need to review and re-think their business strategies and operational approaches to increase their success under uncertainty.

To operationalize the propositions, we can focus on market (such as new markets and product, price, and distribution channel - c.f. Read et al., 2009) and/or human capital factors (such as leadership, market familiarity, entrepreneurial expertise - c.f. Andrew L Zacharakis, McMullen, & Shepherd, 2007) to develop further hypotheses and conduct empirical studies to test the concepts discussed in this paper.

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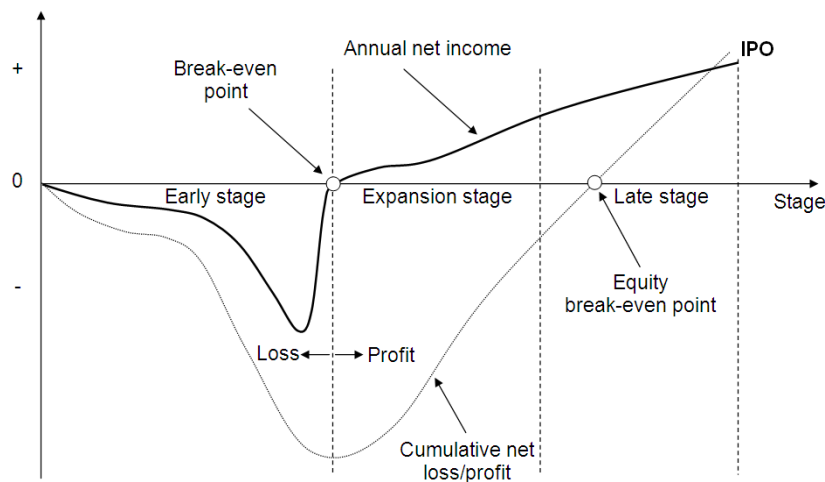
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APPENDIX

Figure 1: Venture Development Stages



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|------------------------|----------------------------------------------------------------------------------------------------|
| Early stage | the time period before the venture achieves break-even (getting out from the survival challenge) |
| Expansion stage | the time period after the venture has achieved break-even and is experiencing high growth |
| Late stage | the time when the venture has relatively stabilized growth and is seeking IPO or leveraged buy-out |