The Effects of New Ventures' Resource Strategies on Angels' Investing Outcomes: Big Gains and Big Losses in Angel Investments

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ABSTRACT

Based on a sample of 539 angel investors, we empirically test the impact of new ventures' resource acquisition/allocation strategies in different development stages on angels' abnormal returns and their extremeness. Our findings suggest that at earlier stages, ventures whose entrepreneurs focus more on securing new resources tend to not only give angel investors lower abnormal returns, but also push the angel's returns to extreme points. In contrast, ventures whose entrepreneurs focus more on utilizing current resources tend to not only give angel investors higher abnormal returns, but also pull angel's returns back to the industry average.

Keywords: Angel investment; Extreme performance; Resource acquisition; Resource allocation

Introduction

Wiltbank, Read, Dew, and Sarasvathy (2008) made path-breaking contributions towards our understanding of angel investors and their outcomes, linking angels' investment strategies with angels' returns. First, faced with substantial uncertainty (Robinson and Cottrell 2007), angels may choose either a prediction or a control strategy (Wiltbank, Dew, Read, and Sarasvathy 2006; Wiltbank et al. 2008). A prediction strategy tries to create forecasts of the future, while a control strategy intends to alter probabilities and influence uncertainties of the situation. With a prediction strategy, angels may make large investments based on the forecast of

[2]Certain data included herein are derived from the Kauffman Firm Survey release 1.0. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Ewing Marion Kauffman Foundation.

market growth. In contrast, angels applying a control strategy tend to make small investment to keep affordable loss as low as possible. Second, the choice of the above strategies affects angel investing outcomes. Angels emphasize a control strategy relying on available means and affordable loss, and such a strategic focus tends to incur fewer investment failures without reducing the number of successes. However, angels who focus on predicting the future make larger investments without attaining more success.

The analysis of extreme investment performances is particularly interesting. Due to the high uncertainty in investing in entrepreneurial firms, angels are particularly concerned with market risk and agency risk like avoiding losses (Van Osnabrugge, 1998). The exploration of decision parameters influencing new ventures' success and failure (Wiltbank et al. 2008) echoes the recent attention to extreme performances (Sanders and Hambrick 2007). Sanders and Hambrick (2007) decomposed risk into three elements: (1) the size of the outlay, (2) the spread of possible results (or the variance of potential outcomes), and (3) the possibility of losing most or all of the investment. For angels, emphasizing a control strategy through relying on current available resources to get quick cash flow may reduce investment failures (Wiltbank et al. 2008). Put differently, a control strategy focus reduces the possibility of losing most or all of angels' investment, which is the third element of risk outlined in Sanders and Hambrick (2007).

The connection between Wiltbank et al. (2008) and Sanders and Hambrick (2007) raises a few questions. First, how about other types of risk facing angel investors? Angel investors may prefer a relatively narrow spread of possible results, but they may choose higher future potential with a wider spread of potential outcomes, thereby having the option of big gains. Second, what is the impact of a new venture's strategy on angels' return? Although venture capitalists assess a new venture's strategy to predict its profitability (Shepherd 1999; Shepherd, Ettenson, and

Crouch 2000), there has been little research on the connection between angels' return and a new venture's strategy. Third, do angel investors attend to different strategic factors depending on the stage of development? As organizational configurations may evolve over time (Hansen and Bird 1997; Koberg, Uhlenbruck, and Sarason 1996; Shepherd et al. 2000), angel investors may select new ventures with distinctive strategies according to the life-cycle stage of these ventures (Pintado, de Lema, and Van Auken 2007).

To answer the above questions, we rely on both the entrepreneurship literature (e.g., Bird 1988; Chrisman, Bauerschmidt, and Hofer 1998; Gilbert, McDougall, and Audretsch 2008; Koberg et al. 1995; Wiltbank et al. 2008; Shepherd et al. 2000) and the strategy literature (e.g., Barney 1991; Bowman and Hurry 1993; Wernerfelt 1984). We follow the recent work on extreme performance (Sanders and Hambrick 2007; Wiltbank et al. 2008) by analyzing the factors driving the spread of angels' returns. Specifically, we highlight the importance of new ventures' strategies and how such strategies interact with development stages to impact angels' amalgamated performance and the variance of their performance.

Our study adds to the angel investment literature by explaining how angels' selection of new ventures with distinctive strategies affects angel's return and its variance. It also contributes to the broader entrepreneurship literature in two important ways. First, researchers should pay attention to the impact of decision making on investment failure, average return, and the variance of the return. Performance consequence should include both amalgamated performance and performance extremeness. Second, our results suggest that new ventures' strategies interact with the stage of development, as new ventures tend to face distinct problems at different stages (e.g., Kazanjian 1988). While assessing new ventures' strategies, angel investors should take into consideration the stage of development. In the meantime, we have to point out that our findings

ought to be treated to be exploratory, instead of confirmative. This is mainly due to the large amount of missing values contained in the variables we have used to test our hypotheses. Lacking data with full information about angel investment, we have no other choice but rely on the sample with partial information (Farrell, Howorth, and Wright 2008; Harrison and Mason 2008). Therefore, one of the future directions of this stream of research is to construct a sample with full information about business angels and their investment behaviours.

This article proceeds as follows. After a literature review of angels' investing outcomes, we develop a conceptual model analyzing how new ventures' strategic focus and development stage influence angels' investing outcomes, namely angels' return and its extremeness. We then test the model using a sample of angel investments released by Kauffmann Foundation. Finally, we discuss the research's implications.

Angel Investing Outcomes, New Venture's Strategic Focus, and Development Stage

An emerging stream of research has investigated the scenario of angel investment, as investments in start-up firms by business angels have taken off in the past a few years (Elitzur and Gavious 2003; Wright, Westhead, and Sohl 1998). Although there has been significant difficulty in gathering data on angel investment, the extant literature on angel investment has covered some facets, such as the characteristics of business angels (Duxbury, Haines, and Riding 1996; Van Osnabrugge 1999), timing and method of exits (Lumme, Mason, Suomi 1996, 1998), the role of social relationships on angels' investment decisions (Harrison, Dibben, Mason 1997), investment outcomes (Mason and Harrison 2002), and the impact of angels' investment strategies on angels' returns (Wiltbank et al. 2008).

The literature on angel investment (e.g., Lumme et al. 1996; Mason and Harrison 2002; Wiltbank et al. 2008) has two important implications. First, angels' investing outcomes include

not only the traditional internal rate of returns (IRR) (Lumme et al. 1996), but also investment returns at the extreme, namely either total loss or major success (Wiltbank et al. 2008). As angel investors tend to concentrate on avoiding losses rather than hitting a home run (Benjamin and Margulis 1996; Landström 1995; Mason and Harrison 2002), analyzing extreme performances expands our understanding of angels' "decision strategies that affect success and failure distinctly rather than in the amalgamated category 'performance'" (Wiltbank et al. 2008, p. 14).

Second, angel investors may be faced with two scenarios in their investment. Under the first scenario, angel investors can choose to expect an average return from their investment, and give up the possibility of big wins (and in the meantime, big losses) by choosing investment strategies to reduce future variance. Under the second scenario, angels can make big bets and intentionally increase the variance of their investing outcomes at the cost of affordable investment losses. Although the literature (e.g., Benjamin and Margulis 1996; Mason and Harrison 2002) suggests that angels tend to choose the first scenario with the intention of avoiding total losses, we do not know what strategies angels may take, or what types of new ventures angels select to invest, to narrow the spread of their investing outcomes.

In the following, we intend to extend the current literature on angel investment by making the linkage between new venture strategies and angel investing outcomes. We focus on both angel investors' abnormal returns and extreme returns, following Wiltbank et al.'s research on investment homeruns/failures (2008) and Sanders and Hambrick's (2007) recent analysis of performance extremeness. Moreover, we extend the strategy literature on new ventures' resource strategies at the different stages of development (e.g., Chrisman et al. 1998) to investigate the impacts of new venture strategies on angel investing outcomes.

New Venture's Strategic Focus and the Development Stage

We argue that both angels' investing strategies and new venture's resource acquisition/allocation strategies affect angels' investing outcomes, as visualized in Figure 1. Specifically, new ventures' resource strategies affect angels' investing outcomes for two reasons. First, a new venture's resource strategies influence its performance, which further determines angels' return from the new venture. Although angels may invest in new ventures for some other reasons such as having fun (Benjamin and Margulis, 1996), financial returns are a major motivation. Second, a new venture's resource strategies also reflect angels' preferences. Wiltbank et al. (2008, p. 5) suggested that angels' "difference in the use of prediction and control can impact both the *selection* of entrepreneurs and ventures in which to invest, as well as the *content* of their advice and execution of those ventures over time as they deal with uncertainty". From this perspective, the revealed resource strategies followed by new ventures are the result of angels' choices, which will impact angels' performance.

Insert Figure 1 about here

As suggested in the strategy literature, firm strategies determine organizational performances (e.g., Chrisman et al. 1998; Sandburg 1986; Gilbert et al. 2006). The resource-based view of the firm (RBV, e.g., Barney 1991; Mahoney and Pandian 1992; Peteraf 1993) argues that a firm's unique portfolio of tangible and intangible resources affect the rate and direction of a firm's growth. Researchers in entrepreneurship have expanded the application of RBV in examining various topics in the field of entrepreneurship, such as new venture growth (Gilbert et al. 2006).

Specifically, Chrisman et al. (1998) argued that "the venture's initial strategy must specify what resources are needed as well as how these resources shall be obtained" (pp. 14-15). Moreover, the venture needs a "clear strategy for developing and deploying the resources the venture controls, or seeks to control, if the venture is to attain a lasting competitive advantage in its targeted market" (Chrisman et al. 1998, p. 15). Finally and most interestingly, Chrisman et al. (1998) suggested that the importance of securing external resources decreases as the firm matures, but the importance of allocating resources rises. Put in other words, both resource acquisition and resource allocation are crucial for new venture growth/performance, but the importance varies with the new venture's stage of development.

Resource Acquisition. Acquiring resources is of critical concern for new ventures, as new ventures need the right bundle of resources to execute their decisions (Chandler and Hanks 1994). No matter how good the idea for a new venture is, the lack of resources may force the venture to forego the designed strategy.

New ventures may access resources through either utilizing extant, internal resources or acquiring new, external sources, but each of these two ways has advantages and disadvantages. Applying current resources, such as entrepreneurs' personal technical skills or personal funds, is relatively easy, but the expertise or financial amount required for the growth of the new venture is often beyond available internal resources. In this case, acquiring new resources through renting resources or subcontracting work becomes necessary. Therefore, new ventures depending on extant resources may find it difficult to expand, but those focusing on securing new resources are more likely to grow and to attain superior performance. This argument is similar to the discussion of goals and means orientation in the entrepreneurship literature (e.g., Bird 1988). Means oriented entrepreneurs start new ventures to use their technical skills, while goals oriented

entrepreneurs design strategies to achieve goals without considering the control of resources. As suggested by Smith (1967), goals oriented entrepreneurs are more likely to develop larger organizations. This logic seems to suggest that investing in new ventures with a focus on acquiring new resources will have higher probability to attain superior performance.

However, acquiring new resources is a difficult task for new ventures, as new ventures normally do not have a track record to reduce potential resource providers' concern of risk (Brush, Greene, and Hart 2001). In contrast, new ventures relying on extant resources are not likely to win big, but they will not lose much either. Thus, relying on current resources may decrease new ventures' performance variance, while focusing on acquiring new resources may increase new ventures' performance variance.

The analysis of higher performance variance for entrepreneurs emphasizing new resource acquisition brings some suspicion to the earlier argument regarding acquiring new resources and average returns. Focusing on acquiring new resources does lead to the possibility of higher returns, but the likelihood of failure may bring down the average returns of angels' investment. Theoretical inferences seem to support both positive and negative relationships between acquiring new resources and angels' return. Thus, we propose, as a tentative rather than a definitive hypothesis, that investing in new ventures with a strategic focus on acquiring external resources will increase angels' return.

We further suggest that the impact of resource acquisition strategies on angels' investing outcomes is more visible if the angels invest in new ventures at the early stages of their development. Life-cycle researchers (e.g., Hansen and Bird 1997; Kazanjian 1988; Quinn and Cameron 1993; Van de Ven 1980) proposed that organizational attributes change over time, and that different management styles are needed at different stages. Applying the stage models in

new ventures, Chrisman et al. (1998) suggested that securing resources are more important in the early stages than the later stages, as new ventures are likely to be faced with resource scarceness in the early stages. As they mature, they become more similar to established firms and the redeployment of resources becomes more crucial.

Thus, we have the following hypotheses (see Figure 2.1):

Hypothesis 1a *(tentative). Investing in new ventures in the early stages and with a strategic focus on acquiring new resources will increase angels' returns.*

Hypothesis 1b *(tentative). Investing in new ventures in the early stages and with a strategic focus on applying existing resources will decrease angels' returns.*

Hypothesis 2a. *Investing in new ventures in the early stages and with a strategic focus on acquiring external resources will increase performance extremeness in angels' investing outcomes.*

Hypothesis 2b. *Investing in new ventures in the early stages and with a strategic focus on applying existing capabilities will decrease performance extremeness in angels' investing outcomes.*

Hypothesis 3. *The impact of new ventures' resource acquisition strategies on angels' investing outcomes will be more visible among investments in early-stage new ventures than those in later-stage new ventures.*

Insert Figure 2 about here

Resource Allocation. New ventures not only need a clear strategy for accessing resources, but also demand a clear strategy for deploying resources to sustain their survival and growth (Chrisman et al. 1998). We can divide resource allocation strategies into two categories (e.g.,

Bowman and Hurry 1993): large and full-scale investment with delayed positive cash flow vs. smaller and incremental investments with quick positive cash flow. Wiltbank et al. (2008) argued that angels may put more emphasis on either making smaller investments or making larger investments. New ventures may apply similar strategies. They can choose to make smaller investments, receive positive cash flow quickly, and ensure their survival. In contrast, they can select to make larger investments, bear longer periods of delayed positive cash flow, stay on plan, and expect to earn big in the future. Here, our focus is different from Wiltbank et al. (2008), as they focus on angels' investment strategies while we emphasize new ventures' investment style.

Current research seems to suggest that new ventures emphasizing smaller incremental investment and quick cash flow will perform better than those focusing on larger investment and delayed cash flow. Making small investments give new ventures sufficient time to learn about the related markets. New ventures can gradually increase or change their commitment, thereby enlarging their chance of success. In contrast, making larger investments demands for accurate forecasts of the market, and makes it difficult to facilitate future market fluctuations. For example, insights from the international business literature (e.g., Delios and Beamish 2001; Hurry 1993) stress the importance of learning to increase the likelihood of success abroad. A popular case is Japanese firms' acquisition strategies in the United States (Hurry 1993). Japanese firms entered the U.S. by forming joint ventures with local partners. They accumulated knowledge about the US market, developed relationships with their partners, and finally acquired the partners. The current research appears to propose that continuous smaller investment will increase new ventures' performance.

Resource allocation strategies also influence new ventures' performance variance, as well as angels' performance variance. Making small investments facilitates the new venture' adaptations to market fluctuations and reduces the risk of losing its investment, but the new venture may also find it difficult to expand quickly and win big either. By the same token, attention to quick positive cash flow reduces the possibility of losses and ensures the venture's survival. In contrast, making larger investments may facilitate the venture to meet predicted market growth and earn larger profits, but the venture may have to face the risk of losing its investments if its prediction does not come into fruit. Thus, making larger investment with delayed positive cash flow will result in higher performance variance.

Similar to our earlier discussion regarding the relationship between resource acquisitions strategies and angels' returns, we argue that analyzing new ventures' performance variance casts doubt on the relationship between the strategy of smaller investment and delayed cash flow on the one side, and angels' returns on the other side. Higher variance associated with larger investment and delayed cash flow means that angels' average returns could be high or low depending on the variance. Therefore, we propose, as a tentative hypothesis, that investing in new ventures with a strategic focus on large investments and delayed cash flow will decrease angels' return.

Finally, we intend to explore the interaction between different investment styles and new ventures' stages of development. Although researchers (e.g., Chrisman et al. 1998; Kazanjian 1988) have argued that new ventures are faced with distinctive strategic problems across their development stages, deploying resources is always crucial and there is not much research suggesting the appropriate investment styles across new ventures' stage of development.

The above discussion leads to the following hypotheses (see Figure 2.2):

Hypothesis 4a (tentative). *Investing in new ventures with a strategic focus on large investments and delayed cash flow will decrease angels' return.*

Hypothesis 4b (tentative). *Investing in new ventures with a strategic focus on small investments and quick cash flow will increase angels' return.*

Hypothesis 5a. *Investing in new ventures with a strategic focus on large investments and delayed cash flow will increase angels' performance extremeness.*

Hypothesis 5b. *Investing in new ventures with a strategic focus on small investments and quick cash flow will decrease angels' performance extremeness.*

Methodology

Sample and Data

To test the hypotheses proposed in the previous section, we extract data from the data set released by the Kauffman Foundation and the Angel Capital Education Foundation using the survey entitled "The Performance Project: Group Angel Investor". According to the report of the Angel Investor Performance Project (AIPP), the data set includes 539 angel investors from 86 angel investor groups in the North America and 1,137 projects from which angel investors have exited (Wiltbank and Boeker 2007). Surveys were sent to members of 276 angel investor groups, and 13% of the members in 86 of them participated (Wiltbank and Boeker 2007).

Besides such a high response rate in the relevant research, rich information helps guarantee the validity of empirical results based on this dataset. Such information includes angel investors' personal information, their relevant investment experience, the business they invested, the interactions between angel investors and entrepreneurs, and relevant financial information.

Measures

Dependent Variables. To simplify the analysis and to avoid confusion, we categorize the projects into three industries following Chua and Wu (forthcoming), and these are service (Service), high technology (HighTech), and others. As shown in Table 1, 22.991 percent of the projects included in the sample were in the service industries, and 35.268 percent were in the high-technology industries, and 41.741 percent were in other industries.

The two dependent variables include *Abnormal Return (AbnR)*, and *Absolute Return (AbsR),* both calculated based on the industry average return of all angel investments.

Abnormal Return (AbnR) is calculated on industry average returns of angel investments included in the sample. The return of each project is measured by the ratio between the total cash flow received by an angel investor and her investment in the project, and the value of *AbnR* is the difference between a project's return and the industry average return.

Absolute Return (AbsR) is measured by the absolute value of the first one, *AbnR*, and it indicates how extreme a project's return relative to the industry average return of all angel investments. *AbnR* has a mean of 0.003, while *AbsR* has a mean of 19.506.

Insert Table 1 about here

Independent variables. New ventures' resource acquisition strategies refer to "*acquiring new resources*" or "*utilizing current resources*", and new ventures' resource allocation strategies include strategies to get "*quick cash flow*" and "*delayed cash flow*". These four independent variables are measured by likert scales with a value of zero as "disagree" and five as "agree".

Acquiring new resources indicates how much the entrepreneurs in a venture emphasize "acquiring the means needed in order to reach their existing goals", and *Utilizing current*

resources illustrates how much the entrepreneurs emphasize "utilizing current means and capabilities to flexibly pursue new goals".

Quick cash flow strategy shows how much the entrepreneurs in a venture prioritize "making smaller investments focused on getting quickly to positive cash flow", and *Delayed cash flow* strategy shows how much the entrepreneurs in a venture prioritize "making larger investments, staying on plan, even if it delayed positive cash flow".

Researchers have suggested that firms may have to be ambidextrous, to respond to internal tensions and reconcile conflicting demands in their operations (e.g., Gibson and Birkinshaw 2004). For entrepreneurs, they may have to secure external resources and utilize extant capabilities simultaneously. Or they may have to get some quick cash flow to survive, while focusing on their major projects. To further explore the possibility of ambidexterity effects (Raisch and Birkinshaw 2008), we also construct two variables measuring the interaction between two resource acquisitions strategies and that between two resource allocation strategies, and thus we have two other variables, namely *acquiring new resources*utilizing current resources*, and *quick cash flow*delayed cash flow*.

Control Variables. We include three categories of control variables which have been identified as significant antecedents of new venture performance and angel investing outcomes in existing research.

The first set of control variables characterize the stage of development of ventures, and four dummy variables, *Seed, Startup, Early growth,* and *Late growth*, are included in this set, so as to indicate the stages of the new ventures when angel investors made the initial investment. Stages of development are important factors for both new venture performance (e.g., Dimov and De Clercq 2006) and angel investment performance (e.g., Mason and Harrison 2002). The

descriptive analysis shows that 31.888 percent of the ventures were at the seed level when the angel investors made their investments, 44.133 percent were at the start-up stage, 18.112 percent of them were experiencing early growth, and 3.061 percent at the late growth stage.

To test the hypotheses regarding resource acquisition/allocation strategies at different stages of new venture development, we construct variables measuring the interactions between entrepreneur's resource acquisition/allocation strategies and stage-of-development variables. These variables indicate entrepreneur's emphasis and priorities at various stages of development.

The second category of control variables highlights the interactions between entrepreneurs and angel investors, and three variables are included in this category. The first two variables, *Similarity1* and *Similarity2*, indicate whether both parties had similar experience in working in large firms and whether they had similar experience in founding new ventures, respectively. These two dummies have a value of one if the two parties have similar experience, and zero otherwise. Recent research (e.g., Franke et al. 2002) has suggested that venture capitalists prefer teams whose training and professional experience is similar to them.

The third variable, *Interaction*, indicates the frequency of interactions between an angel investor and an entrepreneur after the initial investment. As discussed in Chua and Wu (forthcoming), this factor can affect the returns received by angel investors significantly. The average value of this variable *Interaction* is 3.408, which indicates on average, the frequency of entrepreneur-angel interaction is between quarterly and monthly.

The third set of control variables shed light on angel investors' investment and work experience, and they include the number of years of their investment (*investing experience*), the number of years of their being entrepreneurs (*entrepreneurial experience*), and their industry

experience (*Industry experience*). On average, angel investors had 10.484 years of investment experience, 15.293 years of entrepreneurial experience, and 6.134 years of industry experience.

Results

Correlation

Correlations among variables, including dependent, independent and control variables, are presented in Table 2. To spare space, we do not repeat all the significant correlation coefficients. What we would like to highlight here are the correlations between independent variables and the stage-of-development ones. According to the information included in Table 2, the independent variables *acquiring new resources, utilizing current resources*, and *quick cash flow* are negatively correlated with the control variable *Seed*, and positively correlated with the control variable *Early growth*, either at the 5 percent or 1 percent significance level. These results from univariate analysis again support the necessity of including the interaction terms between independent and stage-of-development variables.

Insert Table 2 about here

Empirical results from regressions

The empirical results are obtained from the following three models, the first two for preliminary tests and the third for the main test:

$$\text{Dependent Variable} = \alpha_0 + \alpha_1 * \text{Control Variables} + \varepsilon_1, \quad (1)$$

$$\text{Dependent Variable} = \beta_0 + \beta_1 * \text{Independent Variables} + \beta_2 * \text{Control Variables} + \varepsilon_2, \quad (2)$$

$$\text{Dependent Variable} = \gamma_0 + \gamma_1 * \text{Independent Variables} + \gamma_2 * \text{Control Variables} + \gamma_3 * \text{Interaction Terms} + \varepsilon_3, \quad (3)$$

where independent variables include *acquiring new resources, utilizing current resources, quick cash flow*, and *delayed cash flow*, and interaction terms include that between two entrepreneur's acquisition strategies (*acquiring new resources*utilizing current resources*), that between two entrepreneur's resource allocation strategies (*quick cash flow*delayed cash flow*), those between entrepreneur's resource acquisition strategies and venture's stages of development, and those between entrepreneur's resource allocation strategies and venture's stages of development. Empirical results from Models (1) and (2) are presented in the first two columns in Tables 3 and 4, while those from Model (3) are recorded in the last two columns.

Insert Tables 3 and 4 about here

Model (3) in Table 3 shows that the results of the interaction effects between entrepreneur's resource acquisition strategies and venture's stages of development on angels' return. *Acquiring new resources*Seed* (coefficient=-24.937, p<.05), *Acquiring new resources*Start* (coefficient=-42.026, p<.01), and *Acquiring new resources*Early* (coefficient=-38.978, p<.01), have significant negative effects on angels' returns, while *Acquiring new resources*Late* (coefficient=3.852, p<.01) has a significant positive effect on angels' returns. Therefore, investing in new ventures in the early stages and with a strategic focus on acquiring new resources will decrease angels' return, indicating a relationship contrary to H1a. Two interaction effects between the strategy of utilizing current resources and venture's stages of development, including *Utilizing current resources*Start* (coefficient=9.920, p<.05) and *Utilizing current resources*Early* (coefficient=11.255, p<.05), are significant. Therefore, H1b does not receive support.

Model (3) in Table 4 shows that the results of the interaction effects between entrepreneur's resource acquisition strategies and venture's stages of development on performance extremeness of angels' investing outcomes. Four interactions effects between entrepreneur's resource acquisition strategies and venture's stages of development, including *Acquiring new resources*Seed* (coefficient=28.966, p<.01), *Acquiring new resources*Start* (coefficient=49.644, p<.01), *Acquiring new resources*Early* (coefficient=51.667, p<.01), and *Acquiring new resources*Late* (coefficient=4.669, p<.01) have significant positive effects on performance extremeness, thereby supporting H2a and H2b. The interaction effects between resource acquisition strategies and venture's stages of development are all significant, but coefficients between *acquiring new resources*Late* are much smaller than other interaction effects. Therefore, H3 is supported.

Hypotheses 4a, 4b, 5a, and 5b examine main effects of entrepreneur's resource allocation strategies on angels' return and performance extremeness of angels' return. Model (2) in Table 3 shows that both *Quick cash flow* (coefficient=-2.331, p<.10) and *delayed cash flow* (coefficient=-3.840, p<.01) have significant and negative coefficients. Therefore, H4b is supported, while H4a is not. Model (2) in Table 4 shows that *Quick cash flow* and *delayed cash flow* are not significant, leaving H 5a and H5b unsupported.

However, the interaction effects on angels' return in Model (3), Table 3, including *Quick cash flow*Start, Quick cash flow *Early, Delayed cash flow*Start, Delayed cash flow*Early, are positive and significant,* indicating that in the earlier stages, emphasizing either of the two resource allocation strategies tend to provide higher returns for angel investors. The interaction effects on performance extremeness of angels' return in Model (3), Table 4, including *Quick cash flow*Seed, Quick cash flow*Start, Quick cash flow *Early, Delayed cash flow*Start,*

*Delayed cash flow*Early*, are negative and significant, indicating that in the earlier stages, emphasizing either of the two resource allocation strategies tend to provide angel investors with returns closer to their corresponding industry average returns.

Discussion and Limitations

We intend to investigate the impact of new ventures' resource acquisition/allocation strategies at different stages of development on both angel investors' returns and their extremeness. The results suggest that at the earlier stages, ventures whose entrepreneurs focus more on securing new resources tend to not only give angel investors lower returns, but also push the angel's returns to extreme points. In contrast, at the earlier stages, ventures whose entrepreneurs focus more on utilizing current resources tend to not only give angel investors higher returns, but also pull angel's returns back to the industry average. On the other hand, at the earlier stages, ventures whose entrepreneurs focus on either large investment and delayed cash flow or small investment and quick cash flow are likely to provide not only higher returns than the average for angel investors, but also returns closer to their corresponding industry average returns.

Our study extends previous research examining angels' investment outcomes (Mason and Harrison 2002; Wiltbank et al. 2008) and new ventures' strategies in different stages of development (Chrisman et al. 1998) by analyzing angel investors' extreme performance and the impact of new ventures' resource acquisition/allocation strategies. In the following, we discuss the theoretical and practical implications of our findings.

First, our study extends the analysis of angel investors' performance. Built upon the traditional focus on internal rate of returns (e.g., Mason and Harrison 2002), Wiltbank et al. (2008) stressed the extreme values of angel investor outcomes, namely homerun and negative

IRRs. Homerun refers to the "the number of investment exits where the investor achieved a greater than 100% internal rate of return", and negative IRR means "the number of investment exits where the investor achieved a negative internal rate of return" (Wiltbank et al. 2008, p. 10).

We examine to what extent angel investor outcomes shift away from the industry average, thereby providing complementary results to current research on angel investors' extreme returns. Such variance of angel investing outcomes illustrates the potential risk associated with angel investment. Specifically, the analysis of multiple dimensions of angel investor outcomes allows us to explore the effect of different strategies pursued by new ventures.

Second, our results also contribute to the analysis of new venture strategies in different stages of development (e.g., Chrisman et al. 1998). Although one of the major characteristics of entrepreneurs is to pursue new ideas without considering the current control of resources (Brown et al. 2001), our results suggest that focusing on securing new resources in the earlier stages of development reduces average return and increases the possibility of extreme performance. This may further suggest the difficulty of applying a prediction strategy when the environment is dynamic and uncertain (Wiltbank et al. 2008).

Interestingly, new ventures focusing on acquiring new resources in the late growth stage seem to be better choices for angel investors. Such strategies increase both angels' average returns and extreme outcomes, thereby suggesting a better chance to earn big without increasing the possibility of reducing average returns. In contrast, different resource allocation strategies do not appear to affect angel investor outcomes in distinct ways. In the earlier stages of new venture development, deploying resources by making smaller investments and quick cash flow, or making larger investments and delayed cash flow, seems to work equally well.

Third, our research suggests routes for further explorations regarding the interaction between angel investors' strategies and new ventures' strategies. Wiltbank et al. (2008) detailed the usage of prediction and control strategies by angel investors; our research focuses on the choice of different resource acquisition/allocation strategies by new ventures. An interesting question is how angels with different investment strategies choose new ventures with different resource strategies. For example, if an angel investor tends to apply a prediction strategy in her investment, will she prefer new ventures which emphasize acquiring new resources, making larger investments, and waiting for big cash flow, simply because of the similarity in the investment strategies? Future research could extend the similarity argument (Franke et al. 2006) to investigate if angels select new ventures with similar strategies.

Fourth, this study has implications for angel investing. Angel investors putting money in the early stages of new venture development should pay close attention to the new ventures' resource acquisition strategies. High level of attention to securing new resources by new ventures may increase angel investors' risk exposure. In contrast, angels should probably invest more in new ventures in the late growth stage, as it is more risky to invest in the earlier stages.

Fifth, the current research also raises some caution for angel investors who tend to rely on their experience. Our results indicate that angels' investment experience, entrepreneurial experience, or industry experience do not help angels' gain higher returns. Entrepreneurial experience and industry experience help angels to reduce performance variance, but investment experience seems to increase the variance of angels' returns. Therefore, experience does matter, but what matters more is what kind of experience we are talking about.

Although we believe our findings provide important extensions to earlier research, the study has its limitations. As we described in the introduction and methodology sections, there

may be a potential selection bias caused by missing values of some variables. Moreover, these missing values significantly reduce our sample size. This has been realized as one of the common concerns in the literature on angel investments due to the limited sources of collecting data (e.g., Farrell, et al. 2008; Harrison and Mason 2008). To ensure the robustness of our empirical findings, we have run tests using alternative combinations of variables. Although we have taken measures to reduce the influence of the small sample size and have verified the robustness of the results, we recognize that future research may require larger samples. This concern results in the exploratory, but not confirmative, nature of our findings. A future study using a sample with full information about business angels and their investment behaviours will be important to confirm the findings of the current one, and is expected to make shed light on this stream of the literature.

Second, as we extract our data from a data set released by the Kauffman Foundation and the Angel Capital Education Foundation, our measures are significantly constrained by the contents of the survey used by the two foundations. Although recent publications using the same data set indicate the reliability of the data set, our measures are based on single items and we cannot check the reliability of these measures.

Conclusion

We intend to explore how a new venture's strategy interacts with its stage of development to impact angel investors' returns and the variance of angels' returns. Our results suggest that at the earlier stages, ventures whose entrepreneurs focus more on securing new resources tend to not only give angel investors lower returns, but also push the angel's returns to

extreme points. In contrast, at the earlier stages, ventures whose entrepreneurs focus more on utilizing current resources tend to not only give angel investors higher returns, but also pull angel's returns back to the industry average. These findings complement and extend current research examining angels' investment outcomes (Mason and Harrison 2002; Wiltbank et al. 2008) and new ventures' strategies in different stages of development (Chrisman et al. 1998).

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Figure 1
Theoretical Framework

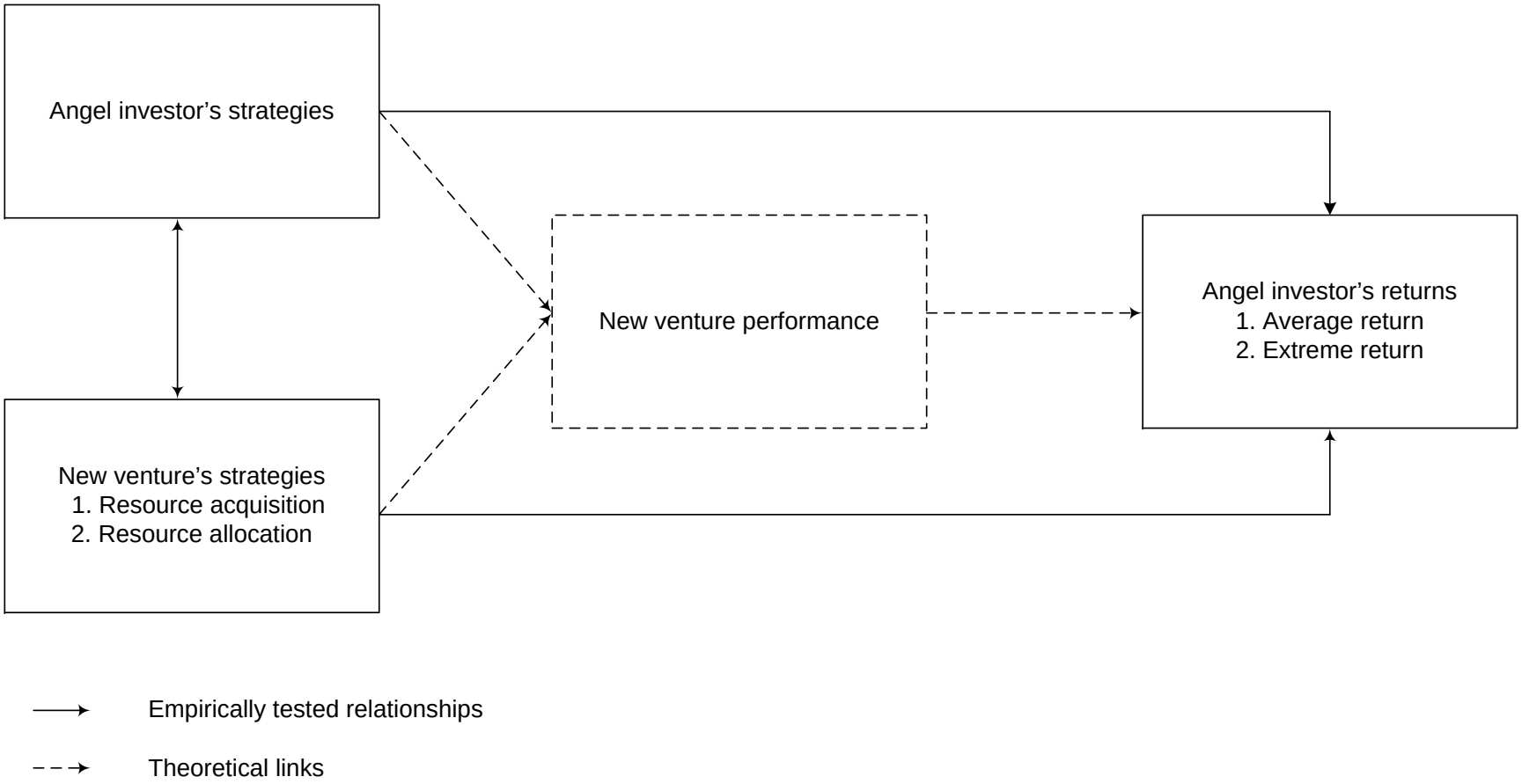

Figure 2

Proposed Relationships between the Joint Impact of New Ventures' Resource Acquisition/ Allocation Strategies and Development Stages on Angels' Investing Outcomes

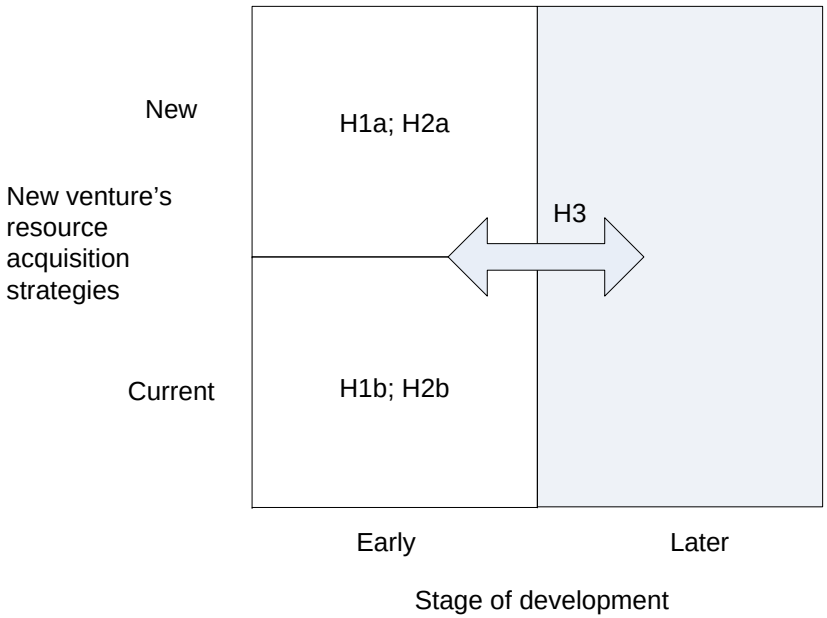

Figure 2.1

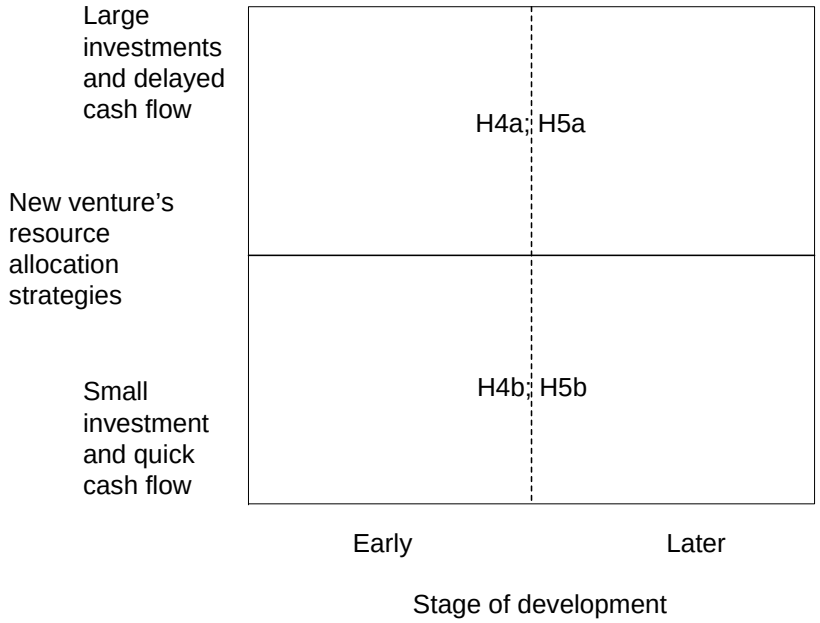

Figure 2.2

Table 1
Descriptive Statistics

Variables	Mean	S.D.	N	Variables	Mean	S.D.	N
AbnR	0.003	90.400	261	Acquiring new resources *utilizing current resources	11.392	7.700	153
AbsR	19.506	88.262	261	Quick cash flow *delayed cash flow	7.216	5.157	153
Acquiring new resources	3.208	1.511	154	Acquiring new resources *Seed	0.863	1.553	131
Utilizing current resources	3.026	1.504	154	Acquiring new resources *Start	1.420	1.889	131
Quick cash flow	2.636	1.567	154	Acquiring new resources *Early	0.802	1.657	131
Delayed cash flow	2.656	1.514	154	Acquiring new resources *Late	0.092	0.613	131
Similarity1	0.435	0.498	115	Utilizing current resources *Seed	0.771	1.433	131
Similarity1	0.376	0.486	117	Utilizing current resources *Start	1.412	1.889	131
Interaction	3.408	1.622	289	Utilizing current resources *Early	0.802	1.652	131
Seed	0.319	0.467	392	Utilizing current resources *Late	0.092	0.601	131
Startup	0.441	0.497	392	Quick cash flow *Seed	0.679	1.302	131
Early growth	0.181	0.386	392	Quick cash flow *Start	1.122	1.692	131
Late growth	0.031	0.172	392	Quick cash flow *Early	0.702	1.487	131
Investment experience	10.484	9.381	814	Quick cash flow *Late	0.099	0.655	131
Entrepreneurial experience	15.293	11.028	769	Delayed cash flow *Seed	0.802	1.496	131
Industry experience	6.134	9.929	322	Delayed cash flow*Start	1.176	1.685	131
Service	0.230	0.421	448	Delayed cash flow*Early	0.641	1.393	131
Hightech	0.353	0.478	448	Delayed cash flow*Late	0.061	0.443	131

Table 2
Correlation Table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	1.000																
(2)	0.978***	1.000															
(3)	0.058	0.102	1.000														
(4)	0.122	0.066	0.763***	1.000													
(5)	-0.007	0.139	0.532***	0.486***	1.000												
(6)	-0.093	-0.142	0.522***	0.449***	0.118	1.000											
(7)	-0.010	-0.075	-0.235***	-0.268***	-0.211**	-0.076	1.000										
(8)	-0.073	-0.020	-0.005	0.037	-0.056	-0.037	-0.608***	1.000									
(9)	-0.031	-0.052	0.187**	0.235***	0.215**	0.087	-0.322***	-0.418***	1.000								
(10)	-0.014	0.012	0.069	0.083	0.159*	-0.021	-0.122**	-0.158***	-0.084*	1.000							
(11)	0.036	0.103	0.228*	0.231*	0.226*	0.050	-0.139	-0.167	0.181	0.139	1.000						
(12)	-0.029	0.173	-0.100	-0.159	0.104	-0.206	0.063	-0.153	-0.093	0.162	0.265***	1.000					
(13)	0.202**	0.167**	0.102	0.175*	0.167*	-0.037	-0.035	0.015	0.007	0.098	-0.067	-0.178	1.000				
(14)	0.117	0.134*	-0.135	-0.095	-0.108	-0.182**	0.038	-0.084	0.001	-0.036	-0.008	0.040	0.317***	1.000			
(15)	0.154*	0.122	-0.129	-0.235***	-0.141	-0.152*	0.021	-0.006	-0.043	-0.106*	0.091	-0.001	0.205***	0.461***	1.000		
(16)	0.109	0.086	-0.020	0.075	0.046	-0.090	0.048	-0.021	-0.056	0.043	0.076	-0.027	0.221***	0.199***	0.155***	1.000	
(17)	0.000	-0.075	-0.087	0.032	0.094	0.020	0.015	-0.074	0.087*	0.002	0.223*	0.027	-0.064	-0.169***	-0.092*	-0.077	1.000
(18)	0.000	-0.129**	-0.107	-0.117	-0.282***	-0.003	0.050	0.047	-0.062	-0.009	-0.282**	-0.062	-0.001	-0.020	0.092*	0.155***	-0.403***

***p<0.01; **p<0.05; *p<0.1

Note: (1) AbnR, (2) AbsR, (3) Acquiring new resources, (4) Utilizing current resources, (5) Quick cash flow, (5) Delayed cash flow, (6) Seed, (7) Startup, (8) Early growth, (10) Late growth, (11) Similarity1, (12) Similarity2, (13) Interaction, (14) Investment experience, (15) Entrepreneurial experience, (16) Industry experience, (17) Service, (18) HighTech.

Table 3
Empirical Results Using Dependent Variables AbnR

	Model (1)		Model (2)		Model (3)			
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Acquiring new resources			2.439	1.70	14.693***	4.39	39.716***	3.36
Utilizing current resources			0.211	0.16	-3.654	-0.68	-11.297**	-2.52
Quick cash flow			-2.331*	-1.90	-17.888***	-5.98	-21.114**	-2.25
Delayed cash flow			-3.840***	-3.13	-13.095***	-4.98	-12.731***	-3.62
Acquiring new resources *utilizing current resources					0.448	1.06	0.492	1.13
Quick cash flow *delayed cash flow					-0.319	-0.66	-0.503	-0.95
Acquiring new resources *Seed					--	--	-24.937**	-2.43
Acquiring new resources *Start					-17.001***	-4.40	-42.026***	-3.58
Acquiring new resources *Early					-13.702***	-3.35	-38.978***	-3.25
Acquiring new resources *Late					6.614***	5.16	3.852***	3.43
Utilizing current resources *Seed					-7.130	-1.52	--	--
Utilizing current resources *Start					2.675	0.55	9.920**	2.59
Utilizing current resources *Early					4.639	0.84	11.255**	2.24
Utilizing current resources *Late					--	--	--	--
Quick cash flow *Seed					5.302*	1.76	9.725	1.05
Quick cash flow *Start					19.660***	5.85	23.575**	2.58
Quick cash flow *Early					17.765***	4.96	22.519**	2.52
Quick cash flow *Late					--	--	--	--
Delayed cash flow *Seed					2.207	0.91	2.028	0.65
Delayed cash flow*Start					14.323***	6.25	13.872***	4.69
Delayed cash flow*Early					13.611***	4.82	13.343***	3.79
Delayed cash flow*Late					--	--	--	--
Seed	-2.545	-0.30	0.471	0.07	--	--	66.312***	6.03
Startup	-6.507	-0.80	-9.100	-1.43	-60.219***	-8.41	8.261	0.80
Early growth	-5.501	-0.65	-4.227	-0.64	-68.560***	-6.79	--	--
Late growth	18.890	1.37	18.907*	1.83	--	--	--	--
Similarity1	3.056	0.79	4.678	1.34	-2.233	-1.34	-2.072	-1.22
Similarity2	0.978	0.26	0.048	0.01	0.169	0.13	-0.615	-0.43
Interaction	2.012**	2.11	1.595*	1.98	0.708*	1.95	0.718*	1.93
Investment experience	-0.083	-0.31	-0.099	-0.45			-0.042	-0.35
Entrepreneurial experience	-0.081	-0.38	-0.226	-1.12			-0.132	-1.27
Industry experience	-0.073	-0.38	-0.021	-0.15			0.047	0.73
Service	14.594***	3.10	17.065***	4.41	20.288***	11.57	20.685***	10.68
Hightech	18.737***	4.43	19.174***	5.04	20.852***	15.53	21.800***	14.18
Constant	-17.255	-1.53	-4.964	-0.45	36.541***	4.63	-29.036**	-2.61
N	46		43		43		43	
F-Value	3.62***		5.22***		32.41***		28.09***	

***p<0.01; **p<0.05; *p<0.1

Table 4
Empirical Results Using Dependent Variables AbsR

	Model (1)		Model (2)		Model (3)			
	Coefficient	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**	**Coefficient**	**t-value**
Acquiring new resources			-0.263	-0.33	-20.411***	-11.61	-49.066***	-12.37
Utilizing current resources			0.462	0.64	6.291**	2.24	21.982***	14.64
Quick cash flow			0.021	0.03	12.047***	7.67	32.488***	10.32
Delayed cash flow			-0.631	-0.93	6.172***	4.47	8.366***	7.10
Acquiring new resources *utilizing current resources					-0.195	-0.88	-0.271*	-1.86
Quick cash flow *delayed cash flow					0.118	0.46	0.015	0.08
Acquiring new resources *Seed					--	--	28.966***	8.42
Acquiring new resources *Start					21.009***	10.35	49.644***	12.62
Acquiring new resources *Early					22.891***	10.65	51.667***	12.87
Acquiring new resources *Late					6.053***	9.00	4.669***	12.41
Utilizing current resources *Seed					15.414***	6.26	--	--
Utilizing current resources *Start					-5.814**	-2.27	-21.158***	-16.46
Utilizing current resources *Early					-3.805	-1.32	-19.258***	-11.44
Utilizing current resources *Late					--	--	--	--
Quick cash flow *Seed					-12.907***	-8.18	-33.072***	-10.70
Quick cash flow *Start					-12.777***	-7.24	-32.935***	-10.76
Quick cash flow *Early					-15.131***	-8.05	-35.059***	-11.72
Quick cash flow *Late					--	--	--	--
Delayed cash flow *Seed					-6.855***	-5.41	-8.780***	-8.44
Delayed cash flow*Start					-6.425***	-5.34	-8.559***	-8.63
Delayed cash flow*Early					-9.658***	-6.51	-11.250***	-9.54
Delayed cash flow*Late					--	--	--	--
Seed	2.039	0.37	2.771	0.76	--	--	-0.878	-0.24
Startup	5.212	0.99	4.086	1.16	-2.412	-0.64	-1.074	-0.31
Early growth	2.817	0.52	3.577	0.99	1.446	0.27	--	--
Late growth	27.986***	3.13	29.849***	5.24	--	--	--	--
Similarity1	-0.205	-0.08	0.125	0.06	0.211	0.24	0.431	0.76
Similarity2	1.374	0.56	0.571	0.32	-0.260	-0.37	-0.219	-0.45
Interaction	0.398	0.65	-0.332	-0.75	-0.004	-0.02	0.069	0.56
Investment experience	-0.195	-1.11	-0.057	-0.48			0.106**	2.69
Entrepreneurial experience	0.016	0.11	-0.046	-0.42			-0.063*	-1.78
Industry experience	-0.119	-0.97	-0.086	-1.08			-0.053**	-2.44
Service	-14.825***	-4.85	-14.618***	-6.85	-17.019***	-18.50	-16.660***	-25.67
Hightech	-13.845***	-5.05	-16.104***	-7.69	-18.284***	-25.94	-18.366***	-35.64
Constant	15.971**	2.18	19.779***	3.25	23.711***	5.72	22.156***	5.95
N	46		43		43		43	
F-Value	5.42***		11.16***		67.45***		143.90***	

***p<0.01; **p<0.05; *p<0.1