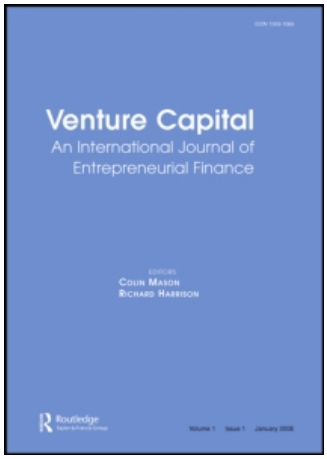

Venture Capital
An International Journal of Entrepreneurial Finance
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713798069

Investment practices and outcomesof informal venture investors

Robert Wiltbank [a]
[a] Willamette University, Oregon, USA

Online Publication Date: 01 October 2005
To cite this Article: Wiltbank, Robert (2005) 'Investment practices and outcomesof informal venture investors', Venture Capital, 7:4, 343 - 357
To link to this article: DOI: 10.1080/13691060500348876
URL: http://dx.doi.org/10.1080/13691060500348876

Venture Capital,
Vol. 7, No. 4, 343–357, October 2005

Routledge
Taylor & Francis Group

Investment Practices and Outcomes of Informal Venture Investors

ROBERT WILTBANK
Willamette University, Oregon, USA

(Accepted 17 August 2005)

ABSTRACT *This study explores a model of venture investing developed from the literature on formal venture capital research in the setting of angel investing in the USA. The model explores the role of venture stage, due diligence, deal flow, co-investing and post investment participation on the distribution of returns to angel investors. Doing so directly addresses an interesting question regarding the extent to which formal venture capital practices are appropriate and effective in the typical angel investment setting. In the process, results from the first relatively large-scale study of angel investor outcomes in the USA are reported and related to earlier findings for UK angel investors.*

KEY WORDS: Angel investing, informal venture capital, venture investing returns, entrepreneurial finance

Introduction

A few years ago, Mason and Harrison (2002) reported investment outcomes for business angel investors in the UK, one of the very few investigations of performance data for these informal venture capitalists. In answer to the question of 'is it worth it?', they raised several concerns about the risk profile of angel investors, where investment failures are the rule rather than the exception. However, their results relative to formal venture capital outcomes (Murray, 1999) showed significantly lower proportions of investment failure and comparable 'homerun' outcomes. It may well be worth it, but significantly more information is still needed.

The present study furthers efforts to understand informal venture investing in two ways. First, the effects of using practices that are common in the formal venture capital industry in an angel investing setting are explored. Exploring these practices allows direct consideration of the fit of formal venture capital as a model or guide for angel investors. Second, this study reports results from the first large scale study of angel investor outcomes in the USA. Comparison of this new information to Mason and Harrison (2002) further triangulates knowledge around this relatively unspecified area of venture investing. Together these address the research questions

Correspondence Address: Robert Wiltbank, Atkinson Graduate School of Management, Willamette University, Salem, Oregon 97301, USA. Tel: 503-370-6955; Email: wiltbank@willamette.edu

ISSN 1369-1066 Print/1464-5343 Online/05/040343-15 © 2005 Taylor & Francis
DOI: 10.1080/13691060500348876

at hand: first, how do important factors in formal venture capital investing relate to angel investor performance? Second, how do the outcomes of angel investors in the US compare to earlier outcome data from informal venture investors in Europe?

Angel investing occurs at the intersection of two interesting areas of study: equity investing and entrepreneurship. While it is a mix of both fields, the current state of the art primarily represents the investing perspective, drawing almost exclusively upon theoretical research into formal venture capital (Prowse, 1998). The bulk of formal venture capital research, in turn, is informed by principles from large market practices in capital markets and corporate finance. Primary theoretical frames such as information asymmetry, agency theory, and portfolio concepts are used to explain aspects of formal venture capital practice and the structure of the venture capital industry itself (Sapienza and Gupta 1994; Lerner, 1995; Hellman and Puri, 2002). However, in very early stage ventures, where the majority of angel investing takes place, these principles may or may not be driving factors. Anticipating agency risks or overcoming contractual hazards due to opportunism, for example, may not be the primary challenge (Arthurs and Busenitz, 2003; Kelly and Hay, 2003).

Understanding these issues is very important as angel investors play a leading role in financing entrepreneurs beyond their own resources. Current estimates suggest that the angel investing market is actually larger than formal venture capital investing (Sohl, 2005). Furthermore, given their focus in seed stage investments, this translated to approximately $6 billion in angel capital going to seed stage ventures compared to only $330 million from formal venture capitalists in 2004 (MoneyTree Survey, 2004; Wiltbank, 2005). Many entrepreneurs and their high potential ventures are impacted by angel investors at very early points in their development.

With these ideas in mind, the paper proceeds as follows: (i) identifying key factors from formal venture capital that may also be important for angel investing; (ii) evaluating these ideas with the results of a national study of US angel investors; and (iii) looking specifically at these results in combination with those reported by Mason and Harrison (2002) for the UK.

Formal Venture Capital Factors in Angel Investing

Formal venture capitalists make private equity investments into new ventures just as angel investors do, and as a result make a natural comparison group and even role model for angel investing. The visibility of venture capitalist and formal reporting requirements given their legal structure have also made gathering data from venture capitalists much more straightforward than from angel investors who tend to be significantly more private and have no reporting requirements other than private tax returns. Formal venture capital research has primarily focused on two questions. First, do formal venture capitalists have a systematic impact on the performance of the ventures in which they invest? Second, do formal venture capitalists approach equity investing in ways consistent with existing financial theory? Focusing on this second question, three key theoretical perspectives are central: agency theory, information asymmetry and opportunism. Results from this research outline how 'best practices' in venture investing address these key theoretical risk factors (Figure 1). This set of practices provides the backbone for the following set of hypotheses regarding their potential outcome effects in angel investing.

Theoretical Frame	Formal VC Practice
Agency Theory	Involved contracts and incentives Financial commitments and reporting Management Recruiting
Information Asymmetry Adverse Selection	Later stages of venture development Extensive due diligence research High deal flow to improve probabilities
Opportunism Moral Hazards	Controlling positions, control rights Extensive due diligence research Later stages of venture development
Portfolio Theory	Co-investment relationships, syndication Industry specialization, venture interactions

Figure 1. Overcoming risk in venture investing

VC Practice number 1: Investment Stage Focus

Successful new ventures are often conceived as following typical life cycles that roughly proceed from inception of the venture idea, to a seed stage, then a start up phase, a growth stage and finally into some form of exit such as an IPO or acquisition by an established firm. Many venture capital funds mirror this process by specializing in particular stages of funding such as start-up funds, mezzanine funds and so on (Gupta and Sapienza, 1992; Ruhnka *et al*., 1992; Jain and Kini, 2000). Venture capital firms generally avoid investing too early—that is, during seed and start up stages—when ventures are barely stable, markets are unknown and the lack of track record makes prediction of success more difficult (Gupta and Sapienza, 1992). At the same time, they avoid investing too late, when equity prices are likely more in line with overall market expectations as the uncertainty surrounding the venture and its opportunity declines.

By not investing in the earliest stages of a new venture, venture capitalists avoid moral hazards associated with injecting the single largest piece of investment in the venture. Furthermore, this also significantly reduces the amount of time they need to invest in monitoring the venture (Sapienza and Gupta, 1994; Gifford, 1997). Investing outside the seed stage also helps reduce adverse selection issues, the idea that the best entrepreneurs self-select out of the venture capital market, as the ability to assess the deal and track record of performance improves in later stages (Triantis, 2001).

H1: Investors that make fewer investments in seed stage ventures will experience fewer failures.

VC Practice Number 2: Due Diligence

In addition to emphasizing particular stages of venture development, venture capitalists also exert considerable effort in carrying out due diligence. Executed over

several months, due diligence includes investigations into virtually every assumption on which a business is founded (Fried and Hisrich, 1994). It covers background checks of the founders, competitive assessment of market players, market research into the size, composition and potential growth of the firm's target market, investigations into the financial representations of the company's position, and so on (Dileep *et al*., 1992; Jensen, 2002).

Construction of various financial models predicated upon the estimated structure and size of future markets, as well as efforts to predict the future valuation of the investee firms are cornerstones of this effort. For example, Macmillan and Narasimha (1987) show that forecasted financial ratios and their comparison to peer group firms constitute a major aspect of VC due diligence and play an important role in VC investment decisions. With regard to the theories discussed earlier, once again, moral hazard and adverse selection problems are mitigated through extensive investigations of the founders' histories and detailed evaluation of the quality of the deal under consideration.

H2: Investors that spend more time on due diligence will experience more successes and fewer failures.

VC Practice Number 3: Deal Flow Initiatives

Deal flow—the generation of a continuous stream of high quality investment opportunities—is a critical concern for venture investors (Amis and Stevenson, 2001) and the sources of these deals often differs across individual investors (Kelly and Hay, 2000). Correspondingly, venture capitalists undertake initiatives for establishing a broad network of relationships that can refer interesting new deals and entrepreneurs to them. The networks include professionals that work with entrepreneurs, organizations of entrepreneurs, trade associations, etc. (Benjamin and Marguilis, 2000). Deal flow efforts constitute an important method for addressing adverse selection problems through extensive search and diversification. One major source of deal flow through which portfolio breadth is accomplished is the practice of syndication, where investors seek and are sought out by other investors to contribute capital into various rounds of investment across firms outside their core portfolio (Bygrave and Timmons, 1992; Jain, 2001). Where these initiatives are not present and active, investors are unlikely to have the opportunity to invest in the best set of deals possible. While it is challenging to evaluate the quality of deal flow, the breadth of an investor's sources of deals plays a central role. As a result, where investments are made through a more narrow and personal network, they are likely to under perform.

H3: Investors that make more investments in ventures found through friends will experience fewer successes and more failures.

VC Practice Number 4: Co-Investment

When more than one VC is involved in a new deal, these co-investment relationships provide an important 'second set of eyeballs' to the lead investor. Venture capitalists that agree to lead a particular set of investors in a particular deal may seek to be led

by others in other deals. The differential standing and mix-and-match of relationships between venture capital firms in these deals provide important co-operative and reciprocal checks to overcome the non-excludability issue in private equity markets (Lerner, 1994; Jain 2001). The necessity to repeatedly participate in each other's deals reduces the incentive for competitors of venture capital firms investing in due diligence to steal away good quality deals, leaving them 'holding the bag' as it were. For example, Steir and Greenwood (1995) show that prior interactions with entrepreneurs and investors increase their likelihood of co-operation. Additionally, involving co-investors requires that more than one set of investors find the opportunity compelling, helping reduce adverse selection problems.

H4: Investors who make more investments with other investors will experience more successes and fewer failures.

VC Practice Number 5: Participation

In addition, venture capitalists add value to their ventures as they participate in them post investment. This generally occurs in two primary activities, monitoring venture performance, and improving the top management team. This monitoring role often involves overseeing operations and financial performance of the firm, and aiding the founders in defining new markets and strategies (Gompers and Lerner, 2001). Additionally, venture capitalists are instrumental in initiating changes in the top management of the new venture (Boeker and Wiltbank, 2005). Jain (2001) reports that venture capitalists' involvement on new venture boards facilitates significant performance improvements after a venture goes public. While there is an argument that participation is highest only when the venture is in trouble, thus causing the empirical relationship of participation and outcomes to appear negative, the bulk of evidence and theory supports a value-added contribution for participation. This seems to particularly be the case for angel investors who emphasize participation a priori in their investing as opposed to simply responding to problem ventures (Erlich *et al*., 1994; Van Osnabrugge, 1998). Through this participation, investors can deal directly with agency issues, help avoid any exposure to information asymmetry and opportunism concerns, and potentially contribute expertise that contributes to the success of the venture.

H5: Investors that participate more in their ventures post-investment will experience more successes and fewer failures.

Each of these practices helps reduce traditional risk factors: agency concerns, information asymmetry, and opportunism. According to Lerner (1995, 1998) and Fenn *et al*. (1997, 1998), venture capitalists 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 addition to these practices, experience factors of the angel investors are likely to impact their investment outcomes.

Experience. Research on the value of expertise, refining domain specific experience over time, shows a very significant relationship to improved performance in a broad

range of settings (Ericsson and Lehmann, 1996). Experience as an investor is likely to facilitate their deal flow, their ability to do insightful due diligence, and smooth various transactional details. Additionally, investors who are able to continue investing over time require to have been reasonably successful in order to be able to raise new investment funds. In addition to investor experience, many angels have significant entrepreneurial experience (Van Osnabrugge, 1998). Success as an entrepreneur is often how they are able to subsequently participate in angel investing. Their first-hand experience in building a new venture can greatly enhance their ability to add value to the ventures in which they invest. Prior entrepreneurial experience is also likely to enhance their ability to influence the entrepreneurs in which they invest, given their specific and valuable expertise in the field. Politis and Landstrom (2002) go so far as to suggest that a more accurate understanding of angel investors needs to deal with them as entrepreneurs even as they are in the midst of investing.

H6: Investors with more investing experience will experience more successes and fewer failures.

H7: Investors with more entrepreneurial experience will have more successes and fewer failures.

In total, these characterize a robust venture capital perspective for angel investing. The above arguments suggest that angel investors will have more successful and fewer failed investments as they:

- invest in new ventures that are in somewhat later stages of development;
- conduct more due diligence prior to making their investments;
- find venture investment opportunities from a broader set of sources;
- invest in opportunities where other investors are also involved;
- participate with the ventures after they have made their investment; and
- leverage their experience as an investor and an entrepreneur.

Methodology

The data in this study covers the activities of 121 angel investors reporting on 1,038 new venture investments totalling approximately $218 million invested. The process of study followed well-established protocol for survey research (Dilman, 2000). The majority of the sample (75%) was reached in co-operation with 12 angel investor groups in nine different states. The remainder of the sample (25%) was reached through a survey to 150 accredited members of an online investment network named NVST, a national forum connecting investors and entrepreneurs. The total sample reached 600 individuals known to be angel investors, attracting 136 responses for a 23% response rate, 15 of which were incomplete. While a higher response rate is of course desirable, this is on par with prior work with venture capital investors (Ruhnka *et al*., 1992; Sapienza and Gupta, 1994; Gifford, 1997). The bulk of the data relate to investments over the past 10 years (90% of the sample), with the oldest investment reported being made in 1985.

It is important to note that these data have been collected at the level of the angel investor. One way to highlight the difference between data by investor, rather than by venture, is that while 121 investors in this study were involved in 1,038 ventures, those ventures may well have more than 121 total investors. For each angel investor, detailed data on the outcomes for each investment was gathered in order to calculate their distribution of returns, in combination with aggregate measures of their approach to making those investments. For example, the due diligence measure is the average time they typically spend on due diligence as they make new venture investments, rather than the due diligence specifically spent on each investment.

This method affords two key advantages. First, it allows the calculation of outcomes over an investor's entire angel investment portfolio. When data are collected by venture, the angel investor's returns can certainly be calculated for that venture, but their other investments need to be considered in order to reasonably estimate overall outcomes, requiring a reversion to gathering data in a similar fashion to the method used here. Collecting data by angel investor could potentially still report each variable for each venture separately, but pre-tests with investors showed that they simply would not or could not respond to this somewhat overwhelming level of detail. As a compromise, outcome measures were collected for each venture, but the process measures were collected in aggregate fashion. Second, this method allows feasible data collection from many more angel investors than any other method. For perspective, one must consider the low base rate of angel investment in new ventures (perhaps 20% of new ventures take on angel investment), as well as the response rate for those angel investors that are identified (in this study the rate is 23%). Based on these estimates, gathering a similar sample of angel investors 'by venture' rather than 'by investor' would require responses from potentially 3,000 new ventures and follow up with the 600 angel investors that they may or may not identify in a reachable fashion. The method used in the present study took nearly two years of data collection time, and was still significantly more feasible than reaching 3,000 new ventures and their angel investors.

As with any choice, benefits come with trade-offs. In this case, the risk of double counting ventures and self-selection bias are the primary issues. Double counting the outcomes of ventures would occur where two responding investors were owners in the same venture. If this occurred in a substantial enough number of cases, the conclusions drawn in this paper would potentially be confounded by venture specific factors rather than the investor approach factors predominantly used in this paper. As a result of gathering data by angel investor, this cannot be specifically controlled for, but two points suggest that it is not a dominant factor in the results. First, there is no correlation between specific angel group membership and outcomes, a unit of investors very likely to share and co-report the investment outcomes from the same venture. Second, further investigation with the group contributing the largest number of respondents, nearly 100 investments were reported and only two of the investors were jointly in one venture. Additionally, the geographic dispersion of the sample in total (data resulted from investment in at least 15 different states) minimizes the potential for double counting.

One of the other concerns of sampling on the investors, rather than going through new ventures, is a self-selection risk; particularly that investors might only respond if they had been successful overall, and/or only report their positive returns. Given the

lack of empirical data on the population of angel investors, this is an incredibly difficult notion to disprove. However, comparison with other empirical work suggests that it is not central concern. The stage and age emphases of respondents are well in line with case study work: 73% occurred at the seed and start-up stage, and 75% of the ventures were less than two years old (Prowse, 1998). More importantly, respondents reported the majority of their investments as losses, nearly two-thirds of their exits occurred at a loss, while only 20% of their investments were successful (the remaining exits resulted in small positive returns), which is actually more failure than reported in other work with angel investors (Lumme *et al*., 1996; Mason and Harrison, 2002).

These two risks with this method, double counting and self selection bias, cannot be controlled for directly. However, for the reasons stated it appears that they are unlikely to dominate the findings. This understanding of the sample and tradeoffs inherent in its selection set the stage for more careful definition of the specific variables and models used to test the hypotheses.

Independent Variables

- *Total Venture Investments* is simply the total number of investments an investor has made, and represents a control for overall activity to standardize the number of exits in each category.
- *Investment experience* is measured as the number of years over which the respondent has been investing in new ventures.
- *Entrepreneurial experience* is measured as the number of years over which the respondent worked as an entrepreneur.
- *Seed stage* is measured as the number of a respondent's investments made in seed stage opportunities rather than start up, early growth, late growth, and buy-outs.
- *Due Diligence* is measured as the total number of hours that the investor spends investigating the entrepreneur's references, and the venture's market, customers, and operation. This variable was logged for the regressions to normalize it.
- *Personal Relationships* is measured as the respondent's report of their number of investments that came from a personal relationship with the entrepreneur, either as friends, having previously worked together, or the entrepreneur was referred to the investor through a friend.
- *Co-investors* is measured as the number of a respondent's investments in which there were other investors prior to that investment.
- *Participation,* post investment, is measured as the number of hours per week they spend with ventures in which they have already made an investment. This variable was logged for the regressions to normalize it.

Dependent Variable

In a perfect world, every investor would report the amount and date of their cash outflows and inflows for each new venture in which they invest. Internal rates of return could then be calculated in fine detail. However, several issues make measuring investor performance more challenging. First, not all angel investors track

their cash inflows and outflows in perfect detail, and they often occur over a large number of years so that details are not readily accessible. As a result, gathering data for each of the 1,038 deals at that level of detail simply was not possible.

It would also be useful to gather just a summary statistic per exit event, potentially IRR among others, and use that as the measure of success. However, through interviews with angel investors, not everyone tracks their outcomes in the same fashion. There are no formal reporting requirements to limited partners, and therefore no standardized method or statistic, not to mention the difficulty in recalling the exact IRR for each deal.

With these things in mind, and for comparison purposes with Mason and Harrison (2002), outcomes were measured in categories of IRR achieved in each exit. The IRR categories allow for a margin of error in the details of IRR calculation, and still allow the evaluation of the distribution of an investor's returns. Of the 1,038 investments, investors had exited from 414 of them. While there is certainly more information to be gleaned by looking at all of the investments, performance measures in new venture investing are consistently more reasonable when looking only at actual exits. As a result, the hypotheses are tested using only exited investments.

For purposes of hypothesis testing, outcomes were grouped in three categories, those that returned less than their capital invested, those exiting with an IRR of 0% to 99%, and those exiting at 100% or greater. The models for moderate exits were not significant as only 36 investors reported exits in this category, so only the homerun and negative IRR models are shown.

- *Homerun* is the number of investment exits where the investor achieved greater than 100% internal rate of return.
- *Negative IRR* is the number of investment exits where the investor achieved a negative Internal Rate of Return.

While these two categories anchor the regression modelling and hypothesis testing, additional descriptive detail in relation to earlier studies will be discussed later in the paper. The descriptive break down of exits across all of the categories, for example, is shown in Figure 2.

Results

Table 1 shows descriptive statistics and correlations for the variables, while Table 2 shows the regression models. The measures used in the models are predominantly sums of the number of investments made in various constructs. To standardize these sums a control for the overall activity of each investor is included. Essentially, the more investments they have made the more investments they will have for all of the measures.

Hypothesis 1 argued that as angel investors make investments in later stage deals, reducing their investments in seed stage ventures, they will experience fewer failures. This was not supported. Regressions in Table 2 in fact show the opposite. As investors made *more* seed stage investments they experienced significant reductions in investments that exited at a negative IRR.

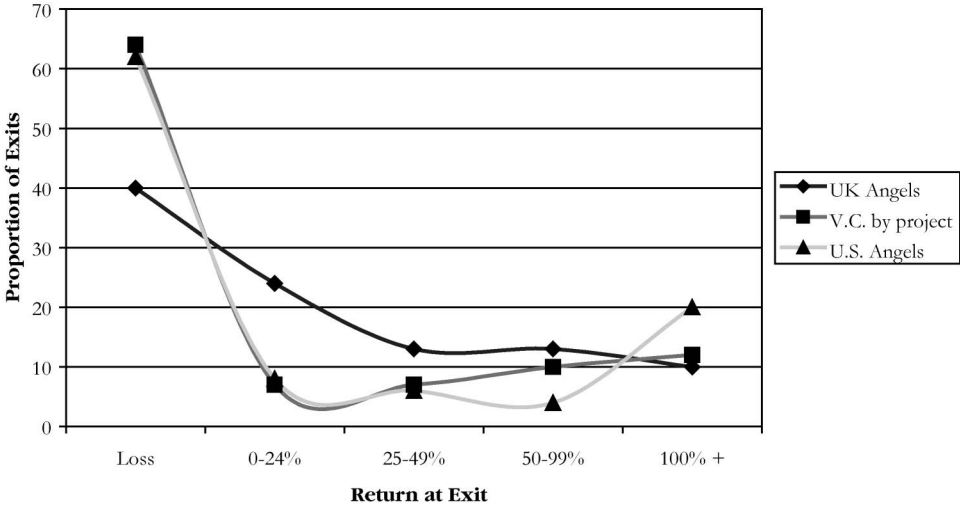

Figure 2. Distribution of returns in early stage investing

Hypothesis 2 suggested that as angels invest more time in their due diligence efforts, they will experience more success and fewer failures. This hypothesis was partially supported, as due diligence was significantly related to an increase in homerun exits. However, more due diligence was also moderately related to an increase, not a decrease, in negative exits.

In addition to seed stage investing, and due diligence efforts, the source of an investor's new venture opportunities is expected to impact their outcomes. Specifically, as angel investors invest in opportunities that result merely from their own personal network rather than a broader flow of deals, they will have fewer successes and more failures. This hypothesis received no support.

Hypothesis 4 argues that as angel investors invest with other investors they will experience more success and fewer failed investments. This hypothesis was not supported, as it was not significantly related to either positive or negative exits.

Hypothesis 5 argued that as angel investors participate more with the ventures in which they invest they will experience more success and less failure. This hypothesis was partially supported, as participation was significantly related to experiencing fewer negative exits.

In addition to these direct investment variables, investing and entrepreneurial experience were expected to capture other aspects that may be outside the specific scope of those practices from venture capital research. However, both types of experience were unrelated to either homerun or negative exits.

These findings do not suffer from multicollinearity (no tolerance statistic was smaller than 0.5) and are robust to split samples; where the models were run only with investors having made three or more exits, with only seven years or more experience, and finally by deleting the five highest and five lowest performers.

Table 1. Descriptive and correlation statistics

Correlations	Mean	Std. Dev.	N	Overall ventures	Investing Experience	Entrepreneur Experience	Seed Stage	Due Diligence	Personal Sources	Co-Investor	Participation	Negative Exits	Homerun Exits
Overall ventures	8.8	5.0	70	1.00									
Investing Experience	9.9	6.2	70	0.45	1.00								
Entrepreneur Experience	13.0	9.6	69	0.27	0.45	1.00							
Seed Stage	2.2	2.1	70	0.61	0.41	0.13	1.00						
Due Diligence	44.1	44.0	63	0.10	0.15	0.00	0.33	1.00					
Personal Sources	4.1	3.8	70	0.67	0.47	0.15	0.58	0.02	1.00				
Co-Investor	5.7	4.2	69	0.73	0.38	0.10	0.41	(0.03)	0.42	1.00			
Participation	4.6	3.8	64	0.18	(0.02)	(0.19)	0.21	0.42	0.00	0.12	1.00		
Negative Exits	2.4	2.1	70	0.59	0.26	0.07	0.24	0.11	0.33	0.45	(0.04)	1.00	
Homerun Exits	0.8	1.0	70	0.58	0.36	0.18	0.33	0.24	0.37	0.37	0.04	0.56	1.00

Over .24 is significant at the .05 level, over .33 is significant at the .01 level.

Table 2. Regression analyses of investment approach on investor outcomes

	Homerun Exits		Negative Exits	
Constant	0.47	0.74	4.22	0.12
Venture Investments	**0.15**	**0.00**	**0.33**	**0.00**
Investor Experience	0.02	0.33	0.02	0.68
Entrepreneurial Experience	(0.01)	0.70	(0.03)	0.30
Seed Stage	(0.09)	0.25	**(0.32)**	**0.04**
Due Diligence	**0.28**	**0.05**	**0.46**	**0.08**
Personal Sources	(0.01)	0.91	(0.01)	0.96
Co-Investors	(0.03)	0.49	(0.00)	0.96
Participation	(0.36)	0.23	**(1.07)**	**0.06**
Adj R2	0.33		0.40	
N	70		70	

In sum, the key results in relation to the practices from formal venture capital research are:

- Outside of overall activity, experience had little impact on outcomes;
- investing in earlier stages (not later stages) and more participation post investment related to fewer negative exits; and
- investors who did more due diligence experienced more failures, but also more homeruns.

In addition to this evaluation of formal venture investing practices among angel investors, it is interesting to compare the results of this sample with the results reported in Mason and Harrison (2002). Figure 2 highlights the primary comparison surrounding the distribution of returns to angel investors, and also includes data from Murray (1999) on individual investment returns to venture capital investments. In total, the table shows that the US angel investor returns are more similar in distribution to those of the venture capital project returns reported by Murray (1999), with results from the UK angels having significantly fewer negative exits, primarily shifted into the middle categories. Clearly, all three samples show a strong negative skew in early stage investing, representing the risk involved.

In addition to the distribution of returns, Mason and Harrison (2002) report the length of holding period and the performance consequences of stage, technology, and deal size. In these areas, findings are quite similar. UK angels had a median holding period of four years for successful exits, and only two years for negative to break even exits. In this sample of US angel investors, lemons also ripened faster than plums, though somewhat more slowly. The median time to successful exits was 5.8 years, while the median of negative exits occurred at 3.5 years (with about 1 year of standard deviation around each).

Similar to the data for the UK angels, few meaningful relationships to outcomes for angel investors were found when looking at stage, sector, or deal size. The primary exception to this relates to seed stage investments (discussed above) where investors experienced negative exits significantly less as they invested in seed stage opportunities. In total 75% of the investments were made in the seed and start-up

stages, which were correspondingly young firms of two years or less, representative of the very early stage efforts of angel investors. However, the stage of investments, beyond seed, did not distinctly relate to outcomes. Likewise, while the average dollar amount of an investor's investments (mean = $ 210,000, median = $ 60,000) did lead to significantly more due diligence, it did not have a direct effect on the outcomes of their investing. Finally, industry categories, collected in categories of hardware, software, telecommunications, healthcare, retail and manufacturing, also did not have any significant impact on the outcomes to these investors (the majority of deals in this sample were made in the software category (57%) with the other categories evenly splitting the remainder).

Conclusion

This study makes two primary contributions. First, it brings together a baseline model of investment variables from formal venture capital research into a single model to evaluate their role in angel investor outcomes. Second, it represents a broad based study of angel investing practices, detailing US angel investment outcomes for the first time.

The regression models in this study characterize a traditional investor perspective of factors involved in venture investing outcomes. While certainly others, particularly factors that are harder to measure like management talent or execution, are part of the mix, this model is a useful application of venture investing principles. Several of these factors are empirically important in angel investor outcomes. First, the finding that seed stage investments were actually related to *fewer* negative exits is particularly important to angel investors. Normally these earlier stage opportunities are assumed to be more risky and less likely to provide a positive outcome. It may be, however, that these earlier stage opportunities effectively fit the expertise of angel investors.

Due diligence and post investment participation also had some impact angel investor outcomes. Due diligence among angel investors is not practiced consistently and ranged in this study from only a couple of hours to over 200 hours of time spent on due diligence prior to investing. However, the average due diligence in this study is over 40 hours, which does dispel some of the perception that angel investors jump into deals without doing meaningful investigation, but is significantly fewer hours than is typically spent on due diligence by formal venture capitalists. When looking at only investors with exits, the extent of their due diligence was significantly related to an increase in investors' negative *and* homerun exits. Clearly, the causal aspects of this relationship are not yet clear. Are the riskier opportunities driving an increase in due diligence effort? Alternatively, do due diligence efforts assist in finding riskier but higher potential deals? Or do investors willing to do more due diligence also have a willingness to do riskier deals? In combination with the effect of post investment participation on reducing negative exits, these findings make a case for the active role of angel investors in their success.

Broadly, these findings begin to outline the aspects of formal venture capital investing are specifically relevant to angel investing, as well as those that are less so. This is particularly useful to angel groups that have been increasing in formality, and suggests that they need to carefully consider which formal venture capital practices are well suited for their approach to angel investing.

This study represents the first data set of angel investor outcomes in the USA. From a descriptive standpoint, failures occur in nearly two-thirds of angel investments, while 20% of the exits were over 100% IRR. This return distribution is very similar to the distribution of returns reported for individual investments of venture capitalists (Murray, 1999) but significantly higher failure than reported for UK angels by Mason and Harrison (2002). Clearly, angel investing is a risky proposition, but presents accordingly large potential successes. In short, angel investing continues to appear to be 'worth it'. In fact, if one assumes that the investment size is comparable across an investor's investments (this is not a trivial assumption), the overall cash to cash multiple for this sample is 2.9 in the 5.8 years that they held their successful investments, a respectable rate of return depending on how extensively one might adjust for risk.

The study makes key contributions by evaluating a broad set of traditional investment factors in the angel investment setting, and establishing the role of active angels in effecting the distribution of their returns. In combination with the few earlier studies on angel investing outcomes, a clearer picture of the investment performance of informal venture capital investors is developing. Additional studies into the approach and returns of angel investors can help to refine the practice of very early stage venture investing, and inform the organization of angel investor groups as well as policy makers seeking to co-ordinate angel investing as an important aspect of encouraging and financing entrepreneurial endeavours.

References

Amis, D. and Stevenson, H. (2001) *Winning Angels: The Seven Fundamentals of Early Stage Investing* (Harlow: Pearson Educational).

Arthurs, J. D. and Busenitz, L. W. (2003) The boundaries and limitations of agency theory and stewardship theory in the venture capitalist/entrepreneur relationship, *Entrepreneurship Theory and Practice*, winter, pp. 145–162.

Benjamin, G. A. and Marguilis, J. B. (2000) *Angel Financing: How to Find and Invest in Private Equity* (New York: John Wiley and Sons).

Bygrave, W. D. and Timmons, J. (1992) *Venture Capital at the Crossroads* (Boston, MA: Harvard Business School Press).

Boeker, W. and Wiltbank, R. (2005) New venture evolution and managerial capabilities, *Organization Science*, 16(2), pp. 123–133.

Dileep, H., Miller, A. T. and Bowman, E. H. (1992) Calls on high-technology: Japanese exploration of venture capital investments in the United States, *Strategic Management Journal*, 13(2), pp. 85–103.

Dillman, D. (2000) *Mail and Internet Surveys: the tailored design method* (Wiley: New York).

Ehrlich, S. B., DeNoble, A. F., Moore, T. and Weaver, R. R. (1994) After the cash arrives: a comparative study of venture capital and private investor involvement in entrepreneurial firms, *Journal of Business Venturing*, 9, pp. 67–82.

Ericsson, K. A. and Lehmann, A. C. (1996) Expert and exceptional performance: evidence on maximal adaptations on task constraints, *Annual Review of Psychology*, 47, pp. 273–305.

Fenn, G. W. and Liang, N. (1998) New resources and new ideas: Private equity for small business, *Journal of Banking and Finance*, 22, pp. 1077–1084.

Fenn, G. W., Liang, N. and Prowse, S. (1997) The private equity market: An overview, *Financial Markets, Institutions, and Instruments*, 6, pp. 1–106.

Fried, V. and Hisrich, R. (1994) Toward a model of venture capital investment decision making, *Financial Management*, 23(3), 28–37.

Gifford, S. (1997) Limited attention and the role of the venture capitalist, *Journal of Business Venturing*, 12, pp. 459–482.

Gompers, P. and Lerner, J. (2001) *The money of invention : how venture capital creates new wealth* (Boston, MA: Harvard Business School Press).

Gupta, A. K. and Sapienza, H. J. (1992) Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments, *Journal of Business Venturing*, 7, pp. 347–362.

Hellman, T. and Puri, M. (2002) Venture capital and the professionalization of start-up firms: empirical evidence, *The Journal of Finance*, 57(1), pp. 169–197.

Jain, B. A. (2001) Predictors of performance of venture capitalist-backed organizations, *Journal of Business Research*, 52, pp. 223–233.

Jensen, M. (2002) Securing venture capital: today's realities, *Financial Executive*, 18(6), pp. 43–46.

Kelly, P. and Hay, M. H. (2000) 'Deal Makers': reputation attracts quality, *Venture Capital*, 2(3), pp. 183–202.

Kelly, P. and Hay, M. H. (2003) Business angel contracts: the influence of context, *Venture Capital*, 5(4), pp. 287–312.

Lerner, J. (1994) Venture capitalists and the decision to go public, *Journal of Financial Economics*, 35, pp. 293–316.

Lerner, J. (1995) Venture capitalists and the oversight of private firms, *Journal of Finance*, 50, pp. 301–318.

Lumme, A., Mason, C. and Suomi, M. (1996) The returns from informal venture capital investments: an exploratory study, *Journal of Entrepreneurial Small Business Finance*, 5, pp. 139–158.

Macmillan, I. C. and Narasimha, P. N. S. (1987) Characteristics distinguishing funded from unfunded business plans evaluated by venture capitalists, *Strategic Management Journal*, 8, pp. 579–585.

Mason, C. M. and Harrison, R. T. (2002) Is it worth it? The rates of return from informal venture capital investments, *Journal of Business Venturing*, 17, pp. 211–236.

Murray, G. (1999) Seed capital funds and the effect of scale economies, *Venture Capital*, 1, pp. 351–384.

Politis, D. and Landstrom, H. (2002) Informal investors as entrepreneurs—the development of an entrepreneurial career. *Venture Capital*, 4(2), pp. 78–101.

Prowse, S. (1998) Angel investors and the market for angel investments, *Journal of Banking and Finance*, 22, pp. 785–792.

Ruhnka, J. C., Feldman, H. D. and Dean, T. J. (1992) The 'living dead' phenomenon in venture capital investments, *Journal of Business Venturing*, 7, pp. 137–155.

Sapienza, H. J. and Gupta, A. K. (1994) Impact of agency risks and task uncertainty on venture capital, *Academy of Management Journal*, 37(6), pp. 1618–1628.

Sohl, J. (2005) The Angel Investor Market in 2004, University of New Hampshire, Centre for Venture Research, available online: http://www.unh.edu/news/docs/cvr2004.pdf

Steier, L. and Greenwood, R. (1995) Venture capitalist relationships in the deal structuring and post investment stages of new firm creation, *Journal of Management Studies*, 32, pp. 337–357.

Triantis, G. G. (2001) Financial contract design in the world of venture capital, *The University of Chicago Law Review*, 68, pp. 305–322.

Van Osnabrugge, M. (1998) Comparison of business angels and venture capitalists: financiers of entrepreneurial firms, *Venture Capital Report*.

Wiltbank, R. (2005) Angel investing at the individual level, working paper.

Wiltbank, R., Dew, N., Sarasvathy, S. and Read, S. (2005) What to do next? The case for non-predictive strategy, working paper.

Wiltbank, R., Read, S., Dew, N. and Sarasvathy, S. (2005) Strategies of Prediction Versus Strategies of Control: an investigation in the new venture investing setting, working paper.