INFLUENCING INVESTORS: AN EXAMINATION OF ANGEL INVESTOR

PERCEPTIONS OF ENTREPRENEURIAL INVESTMENT OPPORTUNITIES

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INFLUENCING INVESTORS: AN EXAMINATION OF ANGEL INVESTOR PERCEPTIONS OF ENTREPRENEURIAL INVESTMENT OPPORTUNITIES

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ABSTRACT

This dissertation examines the factors which influence angel investor perceptions and their eventual investment decision. I propose a model which has perceived risk and expected return at its core. Visually, this model can be translated into a malleable hurdle rate which entrepreneurs must exceed to receive financing. In this model, influential factors can exert influence in two ways - by moving the investment relative to the hurdle rate and/or moving the hurdle rate relative to the investment. Using a survey data from 203 investment opportunities analyzed by 106 angel investors, this model is empirically tested. The direct effect of leadership quality and business quality had no effect on perceived risk, but leadership quality did have a direct effect on expected return (business quality could not be tested). Experience (as an investor, in industry, and as an entrepreneur), an angel characteristic, had no moderating effect on these relationships. Further analyses suggest that angel investors rely only on return expectations and seem not to consider risk when making investment decisions. Entrepreneur enthusiasm and having a social tie moderated the risk-investment relationship while personal relevance and risk aversion moderated the return-investment relationship. Finally, the nuances of social ties are examined with findings suggesting that entrepreneurs with stronger relationships with the investor benefited by securing investment to a greater extent than

entrepreneurs with weaker ties or no ties. Other tie nuances did not seem to have an effect. Through examining not only *which* factors exert influence, but also *how* these factors exert their influence, these findings offer valuable insights about the distinctions between risk and return, theoretical boundary conditions, and a better understanding of angel investment decision making.

CHAPTER 1:

INTRODUCTION

Angel investors, also known as business angels or informal venture capitalists, provide necessary financing for the growth of young ventures (Wetzel, 1983). The economic significance of angel investors is reflected in both the dollar amount and number of ventures in which they invest. According to estimates, in the United States in 2014, $24.1 billion dollars was dispersed to 73,400 ventures which received funding from approximately 316,600 angel investors (Sohl, 2015). Many of these ventures would otherwise not receive funding as they are deemed too small, risky, or unestablished to warrant investment by venture capitalists (VCs) (Lerner, 1995; Lerner 1998). Despite the significance of these financiers, research in the area of angels and angel investing is still far behind that of other venture financiers. Due to the vital financing position that angel investors hold, it is important to understand how they evaluate entrepreneurial investment opportunities. In this dissertation I add to the literature threefold. First, I propose a model of angel investment centered on a malleable risk-return hurdle rate. Second, I then empirically test the various parts of this model using survey data from angel investors. Third, I focus on one influential factor within the model, social ties, and explore how the nuances of social ties affect angel investment.

Chapter 2 of this chapter explores both what factors affect angel investor perceptions of entrepreneurial investment opportunities and also how they exert influence by proposing a model adopted from the VC literature. The VC model adopted is built upon two of the major considerations that impact an investor's decision to invest, that is, the perceived risk of and the expected return on the investment in the venture. These two

factors have been found to be major considerations used by investors when evaluating

venture investment opportunities (Ganzach, 2000; Tyebjee & Bruno, 1984; Van

Osnabrugge, 2000). However, as an angel investor's perceptions and eventual decision

are based on more subjective perceptions (Aernoudt, 1999; Baty & Sommer, 2002;

Morisette, 2007). I present a model which allows for the influence of these more

subjective factors as well as investor characteristics and more commonly studied

objective characteristics. In doing so, these factors create an adjustable hurdle rate which

must be exceeded to receive investment.

In Chapter 3, I apply several influential factors to the model proposed in Chapter

2. Using data from a survey in which angel investors answered questions about

themselves as well as entrepreneurial opportunities brought before them, I tested whether

the model holds up as predicted. First, I test the effects of business and leadership quality

on perceived risk and expected return. Investor experience is also tested as a moderator

of these relationships. Second, I test the effects of perceived risk and expected return on

investment. Several subjective factors (personal relevance, enthusiasm, and having a

social tie) are examined as moderators of these relationships. Additionally, two investor

characteristics of risk (portfolio diversification and risk aversion) are also tested as

moderators. The findings indicate that entrepreneur enthusiasm and having a social tie

interact with perceived risk. Greater entrepreneur enthusiasm assists entrepreneurs in

securing financing at higher risk levels. Having a social tie also assists entrepreneurs in

securing financing, but only at low risk levels. The findings also indicate the personal

relevance and risk aversion have interactive effects with expected return. Having an

investment opportunity that is personally relevant to the investor will assist the

entrepreneur in securing funding when expected return is lower. Risk averse investors are also less likely to invest at lower expected return levels. These findings confirm that risk and return are two distinct constructs which can be differentially affected by various influential factors.

Finally, Chapter 4 of my dissertation conducts an in depth examination of one particularly intriguing influential factor, social ties. Social ties between investors and members of the venture seeking financing influence the investor's investment decision (Nagy & Obenberger, 1994). Angels who have ties to a an entrepreneur seeking funding possess greater familiarity with the entrepreneurs, increased trust of the entrepreneurs, and increased knowledge of the entrepreneur's capabilities which affect the likelihood of receiving investment (Shane & Cable, 2002; Shane & Stuart, 2002). I examine the direct effects of social ties as well as the characteristics of these ties such as their strength, valence, reputation, and type. In doing so, a more thorough understanding of how tie nuances affect the investment decision is attained. I find that tie strength positively moderates the tie-investment relationship assisting entrepreneurs with strong ties to the investor to have a better chance of securing financing. Social ties also were significant, but this effect was negated once reputation of the entrepreneur was included in the model. This findings suggests that while ties are important, it is rather how highly the investor thinks of the entrepreneur and/or how strong their bond is that influences the investment decision and not merely the presence of a tie as suggested by previous research.

CHAPTER 2:

AN ANGEL'S PERCEPTION OF ENTREPRRENEURIAL INVESTMENT

OPPORTUNITIES

ABSTRACT

Approximately 316,600 angel investors made 73,400 firm investments accounting for

$24.1 billion dollars of funding in the United States in 2014 (Sohl, 2015). These

estimates are indicative of the economic importance of angel investors to the economy as

entrepreneurial financiers. This is in contrast to the estimated $48.3 billion dollars that

venture capitalists invested in approximately 4,356 deals in the United States in 2014

(*MoneyTree Report*, 2015). Despite these economically significant numbers, research on

angel investing lags far behind that of its financing counterpart, venture capital (VC). To

date, much of the extant research provides only basic descriptive statistics or

observations, often at the group level. This is primarily due to the private nature of angel

investors which makes the data necessary for meaningful research difficult and costly to

attain. This study goes beyond existing research, which identifies *what* factors are

associated with the investment decision, by examining *how* factors influence the

investment decision. In doing so, a deeper grasp of how angel investor perceptions form

and change leading to a better understanding of the decision making of these pivotal

investors and assist entrepreneurs in securing funding.

INTRODUCTION

Early stage private investors known as "angel investors" or "informal venture

capitalists" have a critical role in the financing of ventures by providing necessary capital

for growth (Wetzel, 1983). Yet despite their importance as early stage investors, most of

the extant research has focused on VCs leaving further research to be conducted on angel investors and how the evaluate, invest, and interact with the entrepreneurial investment opportunities brought before them.

Angel investors see an entrepreneur's venture in an early growth stage. Typically an entrepreneur has already received funds from friends and family, and has some level of business plan and market knowledge. If the angel invests, and the venture continues to survive and grow, venture capital is often the next step, offering angel investors a chance to exit the venture (Burgelman & Hitt, 2007; De Clercq, Fried, Lehtonen, & Sapienza, 2006). As this timeline indicates, angel investors fill a necessary segment of venture financing as VCs are often unwilling to fund the small, more risky, and less developed firms which angels back (Lerner, 1995; 1998). Angel investors usually invest earlier in the venture's life in the "seed" and "early" stages whereas VCs will typically invest in "later" stages often adding additional capital on top of that which angel investors have already committed (Sohl, 1999). Angel investors hold a vital position for young ventures seeking financing as they are a bridging financier between the entrepreneur, friends, and family who provide initial support and VCs who provide larger amounts at later stages once the venture is more established. With angels and VCs typically contributing at different stages they have complementary roles in venture financing (Freear & Wetzel, 1990).

Angel investors can vary significantly amongst themselves (Mason, 2006). However, the typical angel investor has often been characterized as an older, wealthy, college educated, male often with significant previous success in business (Morrissette, 2007; Prowse, 1998). Angels invest their own money whereas venture capitalists

typically are often professionally managed funds of others investors' money (Wong, Bhatia, & Freeman, 2009). Additionally, angels, either individually or in groups, typically contribute much smaller amounts, often in the range of $100,000 to $2 million invested in each venture round while VCs contribute larger amounts often exceeding $5 million (Sohl, 2003a; Sohl, 2003b).

More recently, collaboration amongst angels has resulted in the formation of official groups or networks. These business angel networks (BANs) provide a larger investing network resulting in greater financing capabilities, visibility, and information sharing (Mason & Harrison, 1997). BANs act as intermediaries connecting individual angel investors with ventures seeking financing (Aernoudt & Erikson, 2002). However, in the interest of better understanding these unique investors, researchers have made attempts at classifying both types of angel investors (e.g. Paul, Whittam, & Johnston, 2003; Sørheim & Landström, 2001) as well as types of angel investments (e.g. Lahti, 2011a).

The financing that angels provide is a major reason that they are sought out by entrepreneurial ventures seeking funding. However, angel investor contributions to a venture can exceed much more than just the requested capital injection. As significant investors in developing ventures, early investors are also in a unique position to contribute their expertise, experience, and personal networks to the venture in which they are invested (Ramadani, 2009; Sapienza, Manigart, & Vermeir, 1996). Assistance above and beyond just financial backing can be extremely valuable to young ventures that lack such resources. Active angel investors often undertake certain roles to assist the venture including consultant, monitor, resource acquirer, and mentor (Politis, 2008). However,

the level of involvement varies widely from angel investor to angel investor. Some angel investors are actively engaged in the venture on a regular basis while others offer little if any assistance beyond capital injection (Prowse, 1998). In the following sections I develop a model building on existing investment models (e.g. Tyebjee & Bruno, 1984) centering around two main constructs - perceived risk and expected return.

FACTORS AFFECTING THE PERCEPTION OF THE INVESTMENT OPPORTUNITY

Numerous factors have the ability to influence how an investor perceives an entrepreneurial investment opportunity and the likelihood of that investor subsequently investing in the venture. These factors range from the investor's perception of the characteristics of the investment opportunity to the characteristics of the investor themselves. However, two often cited main drivers of how investors view an investment opportunity are the investor's perceived risk of the investment and the expected return on the investment. Together the investor's perception of risk and their expected return are two of the major determinants which affect the likelihood of an entrepreneurial venture receiving funding from the investor (Ganzach, 2000; Lange, Leleux, & Surlemont, 2003; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000).

Ventures perceived to be less risky will have a higher likelihood of securing investment (Ganzach, 2000; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). Separation of risk and return is realistically unlikely, but an important theoretical point in order to separate the factors that drive perceived risk from those that drive expected return. Therefore, holding all else equal, at a given expected return level, a venture

investment that the angel perceives to have greater risk will have a lower likelihood of being funded compared to a venture investment with a lower level of perceived risk.

However, enticement, via a higher expected rate of return, is also necessary due to the inherent uncertainties associated with the entrepreneurial venture investments above that of other investments (Mason & Harrison, 2002) as well as compensation for the illiquid position they will be taking by securing a long term stake in a business (MacMillan, Zemann, & Subbanaransimha, 1987). Therefore, holding all else equal, at a given perceived risk level, a venture investment that the angel expects to have greater return will have a higher likelihood of being funded compared to a venture investment with a lower expected return.

While both the investor's perception of risk of the investment in the venture as well as their expected return on investment in the venture are two main drivers of the decision to invest in a venture (Ganzach, 2000; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000), other factors also have the ability to influence the likelihood of an entrepreneurial venture receiving funding. This is particularly the case with angel investors who are known for assessing investment opportunities using more subjective criteria (Aernoudt, 1999; Baty & Sommer, 2002; Morissette, 2007). These factors can exert influence in three ways. First, economic factors have the ability to directly affect perceptions of both perceived risk and expected return by influencing the perception of quality. Second, investor characteristics have the ability to indirectly affect the perceptions of risk and expected return as well as the investor's criteria for investment by as they influence not only how investors perceive risk and return, but also how risk and return then influence investment. Third, non-economic factors have the ability to

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influence the necessary criteria for an entrepreneurial investment opportunity to receive funding by influencing how risk and return affect the investment decision.

Several economic (i.e. objective) factors are commonly used to analyze entrepreneurial investment opportunities. Economic factors of influence include entrepreneur/management team characteristics (Fried & Hisrich, 1994; Lahti, 2011b; Galbraith, DeNoble, & Ehrlich, 2009; Hsu, 2007; MacMillan, et al., 1985; MacMillan, et al., 1987), product/service characteristics (Fiet, 1995; Galbraith, et al., 2009; MacMillan, et al., 1985; MacMillan, et al., 1987; Nagy & Obenberger, 1994), market characteristics (Fiet, 1995; Fried & Hisrich, 1994; Lahti, 2011b; Galbraith, et al., 2009; MacMillan, et al., 1985; MacMillan, et al., 1987), investment characteristics (Galbraith, et al., 2009; Heuven & Groen, 2012; MacMillan, et al., 1987), and the business model/plan (Galbraith, et al., 2009).

Additionally, characteristics of the angel investor can have an impact on their perception of the entrepreneurial investment opportunity and the likelihood that they will invest. Investor characteristics of influence include entrepreneurial experience (Lahti, 2011b; Van Osnabrugge, 1998), investor experience (Lahti, 2011b; Van Osnabrugge, 1998), the investor's existing portfolio of investments (Nagy & Obenberger, 1994), their level of risk aversion (Freear, Sohl, & Wetzel, 2002), and industry experience (Lahti, 2011b; Sudek, 2006/2007; Van Osnabrugge, 1998).

Finally, angel investors have been characterized as evaluating investment opportunities and making investment decisions based on more subjective criteria (Aernoudt, 1999; Baty & Sommer, 2002; Morisette, 2007). Non-economic factors (i.e. subjective) account for this as they have the ability to exert influence by altering the

investor's risk and return criteria necessary for investment. These more subjective non-economic factors include liking the entrepreneur/management (Sudek, 2006/2007), entrepreneur enthusiasm and passion (Cardon, Sudek, & Mitteness, 2009; Mitteness, Sudek, & Cardon, 2012; Sudek, 2006/2007), support of a specific product/service (Brettel, 2002; Brettel, 2003; Harrison & Mason, 2007; Nagy & Obenberger, 1994), support of the community (Brettel 2002; Brettel, 2003; Harrison & Mason, 2007), and to assist well-liked acquaintances (Brettel, 2002; Brettel, 2003; Harrison & Mason, 2007; Shane & Cable, 2002; Shane & Stuart, 2002).

These three groupings of influential factors have the ability to impact the venture's likelihood of receiving funding by either directly exerting influence or exerting influence by affecting the interconnecting relationships between factors. These influential factors are at the core of the angel's perception of the entrepreneurial investment opportunity as a whole and their investment decision.

In the following sections, I articulate a model that illustrates how these factors can exert influence directly on the angel investor's perception of risk and/or expected return, the relationships leading to perceived risk and expected return, or the relationships leading to the likelihood of investment by the angel investor. By basing the model on existing models which focus on perceived risk and expected return (e.g. Tyebjee & Bruno, 1984) and incorporating additional factors which are more indicative of the subjective criteria utilized by angel investors when evaluating entrepreneurial investment opportunities, a more complete picture about how these investors function. In doing so, a more complete picture can be gained about not only *what* influences angel decision making, but *how* this influence is exerted (direct or indirect). In the following sections I

explore this model in depth and each of the influential factors in greater detail and discuss the related theoretical implications of viewing angel investor perceptions in this manner.

A MODEL OF ANGEL INVESTMENT

I begin by exploring perceived risk and expected return in relation to the likelihood of investment by the investor. I then turn my attention to other factors which exert influence on the perception of the entrepreneurial investment opportunity and the corresponding likelihood of investment by the investor. This creates a model grounded on existing models (e.g. Tyebjee & Bruno, 1984) which articulates how economic factors affect risk and return perceptions which then affect the likelihood of investment, but also goes further, taking into account additional subjective criteria (non-economic and investor characteristics) and the indirect effects that such criteria have.

Perceived Risk and Expected Return

A number of criteria influence how an investor perceives an entrepreneurial investment opportunity which in turn affects their likelihood of investing in the venture. Two of the most cited criteria are the investor's perceived risk and the expected return on the investment which together form two major determinants affecting the likelihood of an entrepreneurial venture receiving funding (Ganzach, 2000; Lange, et al., 2003; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). These factors are often combined to form a risk to return ratio, however in the model presented in this dissertation they remain separated as each is a distinct construct. Additionally, influence may be exerted to different extents by different influential factors affecting each differentially.

First, reducing the level of risk associated with a venture not only aides in securing investment (Cumming, Fleming, & Schwienbacher, 2005), but also reduces the

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need for post-investment monitoring and control measures due to the greater uncertainty of the investment (Barney, Busenitz, Fiet, & Moesel, 1989; Gompers, 1995; Sapienza & Gupta, 1994). As the entrepreneurial venture investments which angel investors make are typically more risky than other investment options (Mason & Harrison 2002), the risk of these investments is a major consideration which impacts their evaluation of the investment opportunity (Ganzach, 2000; Maula et al., 2005; Tyebjee & Bruno, 1984).

An investor's expected return on investment in the entrepreneurial opportunity is another major criteria investors consider when considering investing in an entrepreneurial venture (Ganzach, 2000; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). Typically, a high expected rate of return on investment is necessary to entice investors to invest in entrepreneurial ventures which have extensive uncertainty (Baker & Haslem, 1974; Nagy & Obenberger, 1994; Sudek 2006/2007). Investors are therefore more likely to choose to invest in ventures in which they expect a larger return on investment (ROI) in the venture (MacMillan, et al., 1985; MacMillan, et al., 1987; Robinson, 1987; Tyebjee & Bruno, 1984).

Economic Characteristics of the Investment Opportunity

Angel investors' perceptions of both of perceived risk and expected return are in turn influenced directly by their perceptions of economic factors representative of the entrepreneurial investment opportunity. These economic factors may include characteristics of the entrepreneur/management team (Fried & Hisrich, 1994; Lahti, 2011b; Galbraith, DeNoble, & Ehrlich, 2009; Hsu, 2007; MacMillan, et al., 1985; MacMillan, et al., 1987), characteristics of the product/service (Fiet, 1995; Galbraith, et al., 2009; MacMillan, et al., 1985; MacMillan, et al., 1987; Nagy & Obenberger, 1994),

characteristics of the market(s) the firm operates in (Fiet, 1995; Fried & Hisrich, 1994; Lahti, 2011b; Galbraith, et al., 2009; MacMillan, et al., 1985; MacMillan, et al., 1987), characteristics of the investment terms (Galbraith, et al., 2009; Heuven & Groen, 2012; MacMillan, et al., 1987), and the characteristics of the business model/plan (Galbraith, et al., 2009).

An example of how an economic factor could exert influence would be a venture whose founder had a proven track record of developing businesses in the industry the venture operates in allowing owners to successfully cash out of the venture. An entrepreneur of this caliber would entice investors who would expect substantial returns on their investment as due to the entrepreneur's track record would warrant confidence in their capabilities as a successful venture developer. If the entrepreneur had no such record, return expectations would be lower, the investment risk would be higher, and the venture would have a much lower likelihood of receiving investment.

Characteristics of the Investor

In addition to the more objective economic factors directly affecting the angel investor's perception of risk and/or expected return, several characteristics of the angel themselves can affect their perceptions of the entrepreneurial investment opportunity. To date, studies have examined several investor characteristics which affect their perceptions as well as their investment decisions including the investor's own entrepreneurial experience (Lahti, 2011b; Van Osnabrugge, 1998), experience as an investor (Lahti, 2011b; Van Osnabrugge, 1998), the investor's investment portfolio characteristics (Nagy & Obenberger, 1994), the investor's level of risk aversion (Freear, et al., 2002), and industry experience (Lahti, 2011b; Sudek, 2006/2007; Van Osnabrugge, 1998). While

studies have demonstrated that certain angel characteristics do influence the investment decision, they have not addressed exactly how these characteristics exert their influence. Investor characteristics can exert their influence in two ways. First, investor characteristics can affect the relationships between objective factors and perceived risk and/or return. Second, investor characteristics can also affect their proclivity to invest in a venture by moderating the relationships between their perceptions of risk and/or return and their likelihood of investing.

An example of the first case would be that an entrepreneurial investment opportunity operating in a market perceived to be very attractive would warrant a certain level of perceived risk and expected return by an investor which is in line with what was proposed in the previous section regarding economic factors influencing perceived risk. However, an angel investor with in depth investing experience may perceive even less risk as they are more familiar with the venture startup process and what it takes to succeed. The investor with investing knowledge knows is more confident strengthening (or weakening) the relationships between the economic factor and perceived risk and/or expected return. Therefore, a characteristic of the angel investor (investing experience) effectively alters the relationship between the economic factor and perception of risk and/or return.

An example of the latter case would be when another characteristic of the angel, their investment portfolio, affects their proclivity to invest by lowering their risk and/or return criteria allowing riskier or lower expected return projects to receive funding. If an angel has a diversified investment portfolio they may be more inclined to accept an investment which they perceive to have a certain level of risk or return which they would

otherwise pass on if their investment portfolio was not as diversified. Therefore the angel

characteristic (their level of portfolio risk) affects the relationship between expected

returns and/or perceived risk and their likelihood of investment.

Non-Economic Characteristics of the Investment Opportunity

Non-economic factors can also influence the necessary criteria for investment.

That is, an angel may decide that for a certain investment, a higher (lower) level of

acceptable risk and/or a lower (higher) rate of acceptable return than normal is

acceptable, because of that angel's desire to see that specific venture be funded (not

funded). Subjective factors which may influence angel investor perception of risk and

expected return include an affinity for the entrepreneur/management (Sudek, 2006/2007),

the entrepreneur's enthusiasm and passion (Cardon, Sudek, & Mitteness, 2009;

Mitteness, Sudek, & Cardon, 2012; Sudek, 2006/2007), the desire to support a specific

product/service (Brettel, 2002; Brettel, 2003; Harrison & Mason, 2007; Nagy &

Obenberger, 1994), the desire to support the community (Brettel 2002; Brettel, 2003;

Harrison & Mason, 2007), and the desire to assist individuals who are socially connected

to the investor (Brettel, 2002; Brettel, 2003; Harrison & Mason, 2007; Shane & Cable,

2002; Shane & Stuart, 2002).

In effect, these factors can moderate the perceptions of perceived risk and

expected return necessary for an entrepreneurial venture to receive funding from an angel

investor. For example, an angel investor who has a certain perceived risk and expected

return level about an investment in an entrepreneurial opportunity will have a

corresponding likelihood of investing in that venture. However, holding all else equal, if

a certain influential non-economic factor also exists, for example if the investor had a

social tie to the entrepreneur, the relationship between perceived risk and/or expected return and investment would be altered. Therefore, a non-economic factor (social tie) effectively alters one or both relationships making the investor more (or less) likely to invest.

For clarity these relationships have been plotted in Model 1.

MODEL 1

Proposed Model of Angel Investor Investment

```
┌──────────────┐                              ┌──────────────┐
│    Angel     │                              │ Perception of│
│   Investor   │                              │ Non-Economic │
│Characteristics│                             │   Factors    │
└──────────────┘                              └──────────────┘

                      ┌──────────────┐
                      │  Perceived   │
                      │     Risk     │
                      └──────────────┘
┌──────────────┐                                            ┌──────────────┐
│ Perception   │                                            │  Investment  │
│ of Economic  │                                            └──────────────┘
│   Factors    │
└──────────────┘       ┌──────────────┐
                       │   Expected   │
                       │    Return    │
                       └──────────────┘

                              ┌──────────────┐
                              │    Angel     │
                              │   Investor   │
                              │Characteristics│
                              └──────────────┘
```
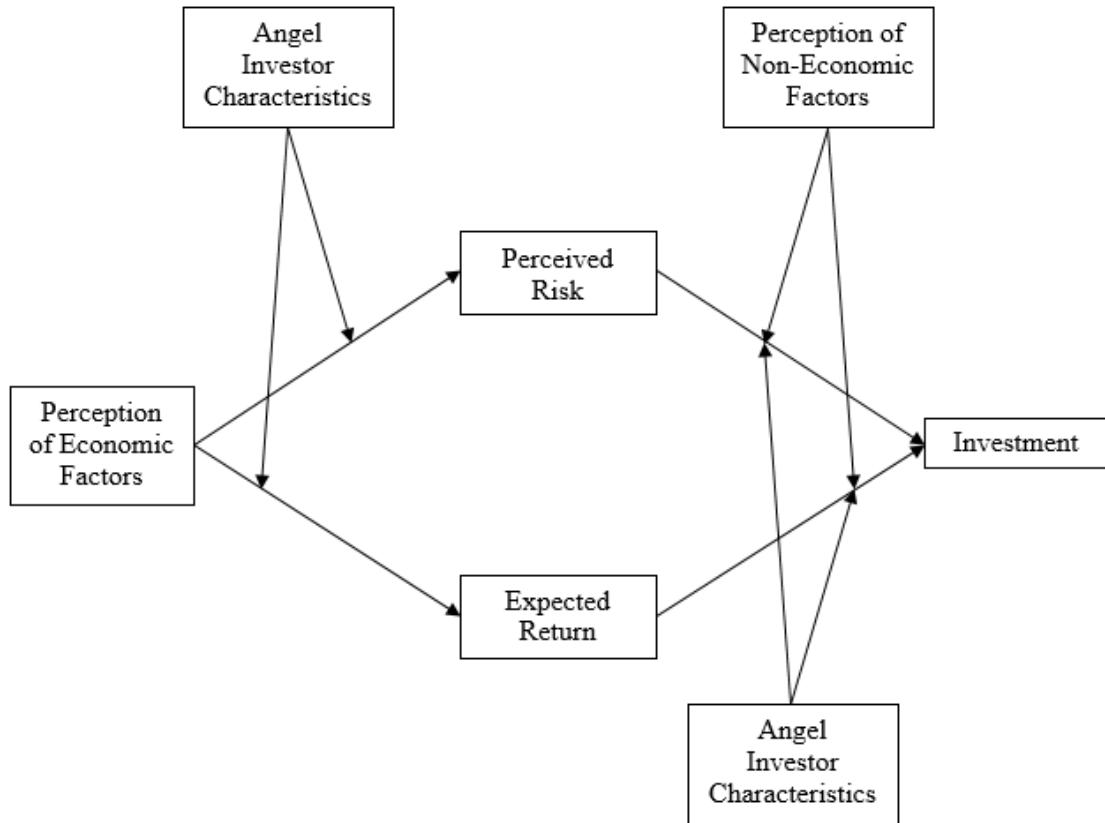
A HURDLE RATE

The model presented above can be visualized as a hurdle rate of investment. This hurdle rate is composed of the two main criteria which influence the investment decision – perceived risk and expected return. In doing so, the relationship between risk and

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return is acknowledged as well as the fact that they are distinct constructs. Perceived risk and expected return, the two main drivers of investment, can be placed on either axis. Entrepreneurial investment opportunities which exceed a certain perceived risk-to-expected return level will receive funding while entrepreneurial investment opportunities which do not exceed this hurdle rate will not receive funding from the angel investor. The model conceptualization of investment perception also allows for necessary flexibility to accommodate for the influence of objective economic factors, more subjective non-economic factors, and investor characteristics. These influential factors exert influence on angel investor perceptions when evaluating investment opportunities, the effects of which can be demonstrated in the visualization of the perceived risk-to-expected return hurdle rate.

Typically, the greater the perceived risk of investing in the venture, the greater the return on the investment in the venture must be for an investor to invest (Baker, Hargrove, & Haslem, 1977; McNamara & Bromiley, 1999). When plotted out on a matrix by perceived risk and expected return, the angel's entrepreneurial investment opportunities will tend to either fall above or below a certain perceived risk-to-expected return ratio. A dividing line can then be drawn between these two groups with entrepreneurial investment opportunities receiving funding on above and those that did not below. This tentative hurdle rate varies from angel to angel as angels are a heterogeneous (Mason, 2006).

The entrepreneurial investment opportunity and tentative angel hurdle rates can be plotted as shown in Figure 1. In this example a BAN brings in a venture to propose a funding opportunity to the member angels, and both Angel A and Angel B are in

attendance, based on a number of factors including economic considerations (e.g. market attractiveness), angel characteristics (e.g. industry experience), and non-economic considerations (e.g. entrepreneur passion) Angel A might perceive the risk to be at level E and the expected return is at level F, which together form the investment opportunity C, which falls below Angel A's hurdle rate. However, Angel B, who has a different hurdle rate, might perceive a risk level of G, and an expected return level of H which together form investment opportunity D which fall above Angel B's hurdle rate. The result is that Angel B will invest in the same venture that will not be invested in by Angel A.

FIGURE 1

Two Different Angels, Two Different Hurdle Rates, Two Different Investment Decisions
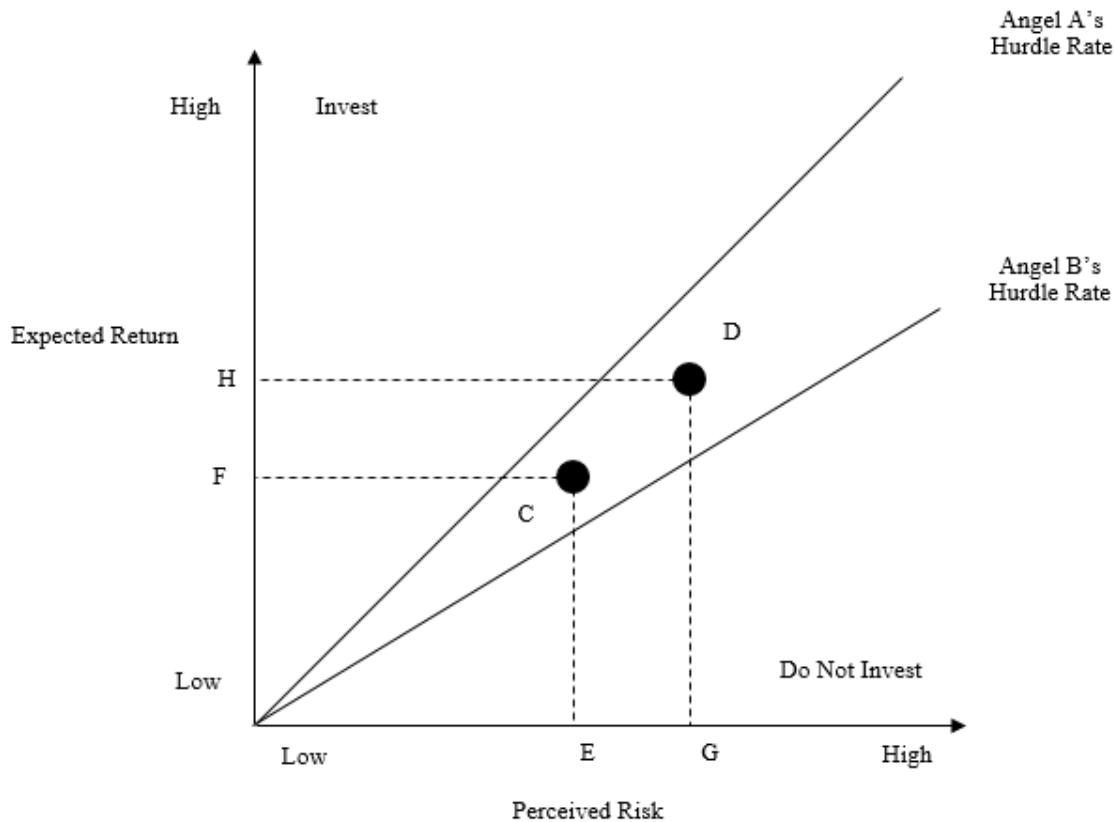
Following this conceptualization of investment, the influence of the three types of influential factors can also be demonstrated visually. These three types of influential factors manifest themselves in two distinct ways within visualization of a hurdle rate. Angel investor characteristics and economic characteristics alter the position of the entrepreneurial investment opportunity within the perceived risk to expected return matrix. Put another way, when plotted the investment can move from side to side and/or up and down depending on the perceptions of risk and return. Angel investor characteristics and non-economic factors affect the acceptable hurdle rate of investment. In other words, these factors do not move the entrepreneurial investment opportunity with regards to risk and return, but instead affect at which levels or risk and/or return investment opportunities are funded by investors – the hurdle rate.

Only if this hurdle rate is exceeded will the angel invest and the entrepreneurial venture secure financing. Therefore, holding all else equal, ventures for which the angel investor perceives risk to be low enough and expected return high enough will receive funding over those which do not exceed the hurdle rate set by the angel investor. However, as angel investors' valuation may not always be so clear cut as their judgments are based on more subjective perceptions of the entrepreneurial investment opportunity (Aernoudt, 1999). The model proposed in this dissertation is based on models focusing on perceived risk and expected return (e.g. Tyebjee & Bruno, 1984), however the model presented here incorporates allowances for influence from more subjective factors of influence. By doing this, a more flexible model is achieved which more appropriately fits angel investor behavior. However, as indicated in the model which this visualization is based on, some flexibility exists for each venture investment opportunity. The perceived

risk and/or the expected return can moved as the investor's perceptions are altered

through economic or investor characteristics or the risk and return criteria can be altered

through the influence of other angel characteristics or certain non-economic factors.

Moving the Investment Opportunity

Examining perceived risk, holding all else equal, at a given expected return level,

a venture investment that the angel perceives to have greater risk will have a lower

likelihood of being funded compared to a venture investment with a lower level of

perceived risk. However, the position of the entrepreneurial investment opportunity,

relative to risk and return, can be moved by economic factors and angel investor

characteristics. In Figure 2, this would mean that investment opportunity C, which Angel

A perceives to have risk level E and expected return F, would not secure financing, as the

perceived risk is too great for the level of expected return. However, holding all else

equal, at a lesser perceived risk level (J), at the same expected return (F), investment

opportunity I would secure financing as this investment exceeds the Angel A's hurdle

rate.

FIGURE 2

Moving the Investment Opportunity Through the Angel's *Perceived Risk*
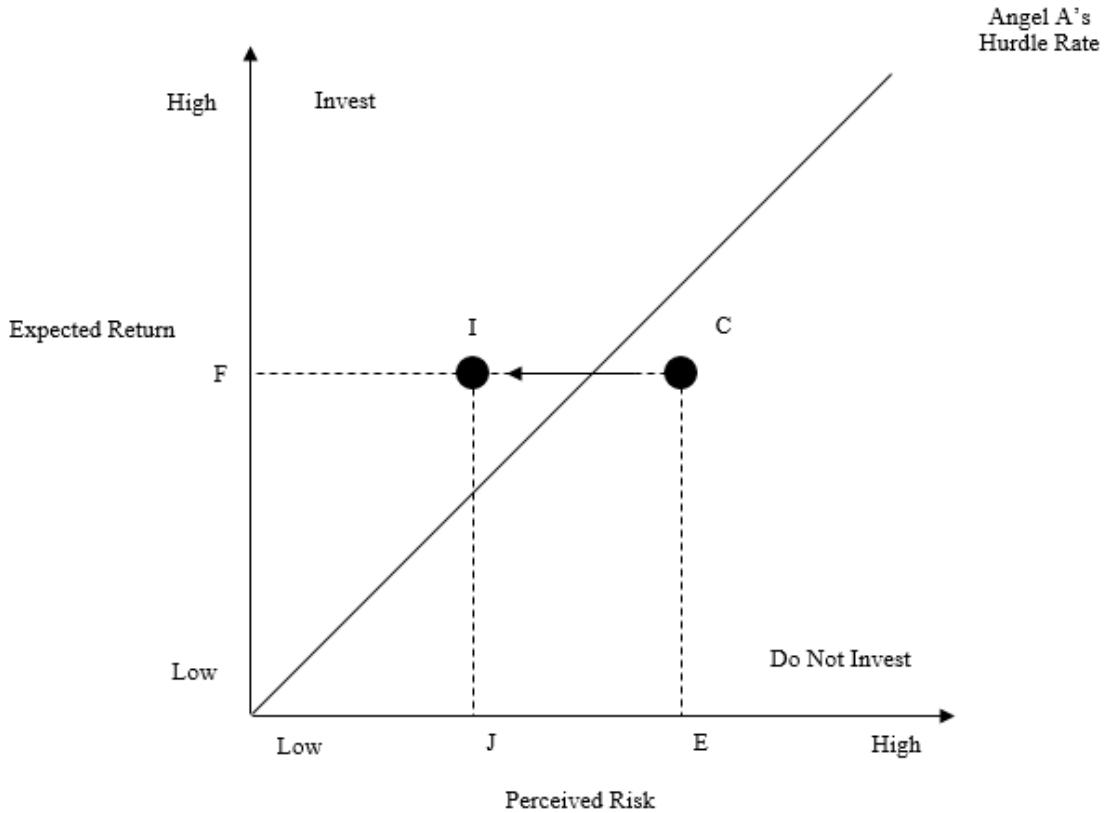
Examining expected return, holding all else equal, at a given perceived risk level, an entrepreneurial investment opportunity that an angel expects to have a greater return will have a higher likelihood of receiving investment versus one with a lower expected return. This is demonstrated in Figure 3, were investment opportunity C, which Angel A has an expected return of level F and perceived risk of level E would not secure funding, as the expected return is too low for the level of perceived risk according to Angel A's hurdle rate. However, for an expected return level of L, at the same perceived risk (E), investment K would exceed the Angel A's hurdle rate and secure financing.

FIGURE 3

Moving the Investment Opportunity Through the Angel's *Expected Return*
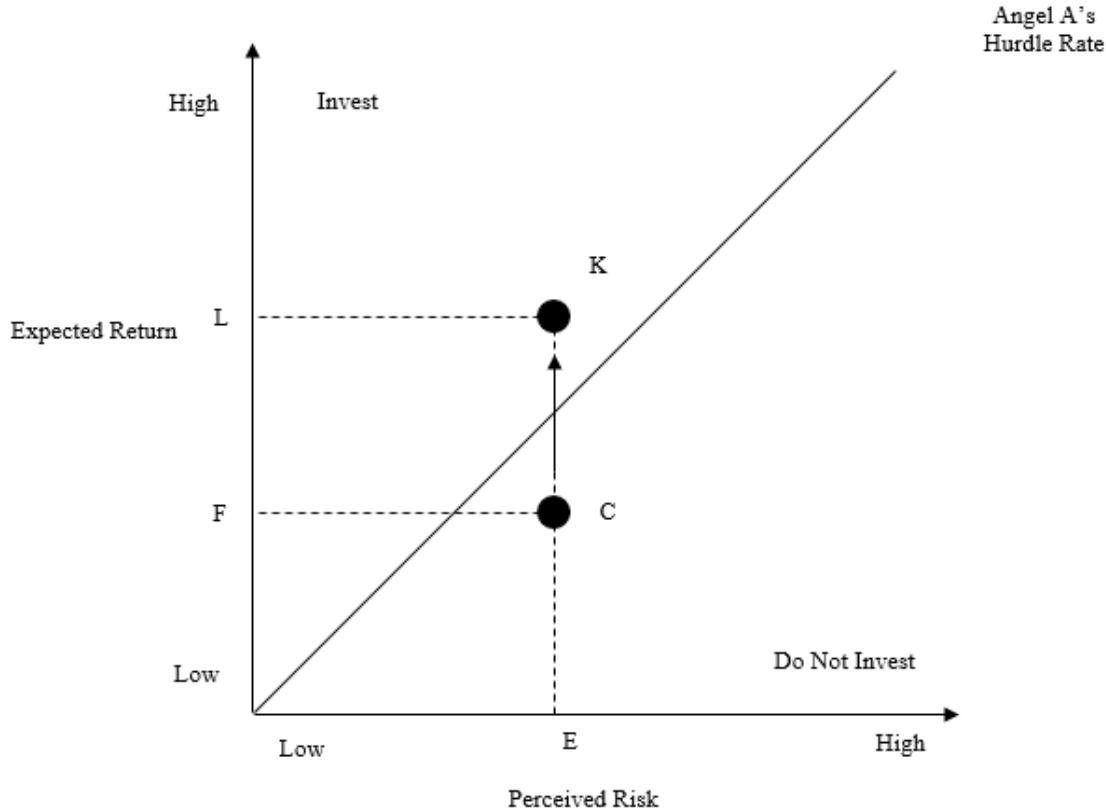
Moving the Hurdle Rate

Additionally, the angel investors risk tolerance can be influenced by non-economic factors and other angel investor characteristics. In Figure 4, holding all else equal, investment opportunity C which the Angel A perceives to have risk E and expected return of F would not receive funding originally as it falls under Angel A's original acceptable hurdle rate, a1. However, certain influential factors can increase the angel's acceptable perceived risk level, resulting in perceived risk tolerance at the same level of expected return. The resulting hurdle rate, a2, has been lowered, as the risk tolerance has shifted to be more accepting of risk, enough so that investment opportunity C will now secure financing from the angel investor despite the same expected return (F)

and perceived risk (E) levels. In effect, this moves the angel's hurdle rate necessary to

secure financing.

FIGURE 4

Moving the Angel's Hurdle Rate Through the Angel's *Perceived Risk*
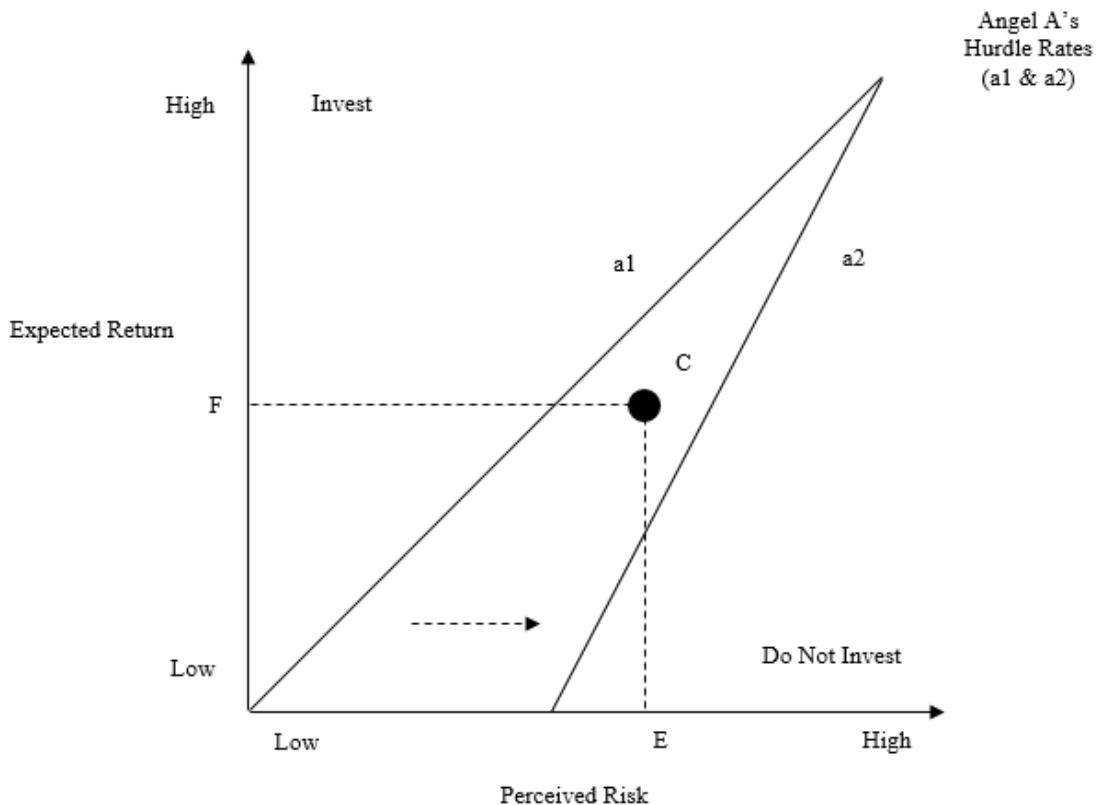
On the other hand, the relationship between the angel's likelihood of investment

and their expected return on the investment in the venture can also be moderated. The

result of which is demonstrated in Figure 5 where, holding all else equal, investment

opportunity C which Angel A perceives to have risk E and expected return F will again

not receive funding as Angel A's hurdle rate, a1, is not exceeded. However, the presence

of certain influential factors can move Angel A's hurdle rate, this time lowering the

return required, potentially resulting in a lowered hurdle rate as the Angel A's expected

return requirement is now lower. With Angel A's hurdle rate lowered to a2, investment

opportunity C, with the same expected return (F) and perceived risk (E), now exceeds the

angel's hurdle rate and will receive funding.

FIGURE 5

Moving the Angel's Hurdle Rate Through the Angel's *Expected Return*
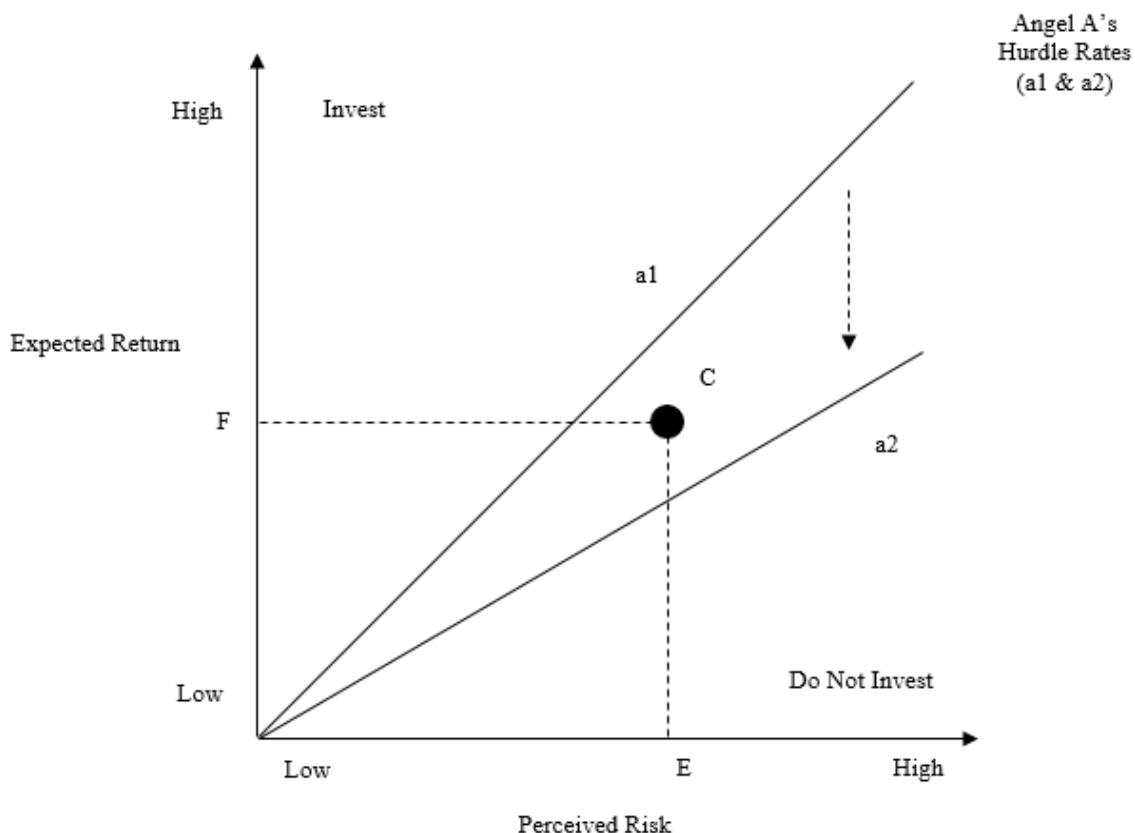
DISCUSSION

This chapter builds on an existing model of venture financing by adding how

exactly angel characteristics, economic, and non-economic factors exert their influence

on angel investor perceptions of entrepreneurial investment opportunities. By doing this,

a better understanding of venture financing is attained. A more flexible model is

proposed which is necessary as existing models do not take into account some of the

more subjective characteristics which influence investment and therefore do not

adequately fit the angel investor context. Perhaps most importantly this model and the accompanying visualization add clarity as to how exactly various influential factors exert their influence on investor perceptions and the corresponding investment decision – a contribution lacking in extant research. The contributions of this dissertation also set the stage for future theory, empirical research, and application.

Theoretical Contributions

Investor perceptions and what influences those perceptions which lead to the likelihood of venture investment are the main ideas in this dissertation. Perceived risk and expected return are two pivotal perceptions on which investment decision making is based. It is important, both theoretically and empirically, to understand that while related to one another each is a unique construct capable of exerting influence and having influence exerted upon it. By breaking these two constructs apart and examining each more thoroughly alone much can be learned about investment decision making.

In addition to examining perceived risk and expected return, economic considerations, investor characteristics, and non-economic considerations are also considered to exert influence on the investment decision. These three types of influential factors are proposed to exert influence on perceived risk, expected return, and/or the relationships surrounding them. Not only is it important to recognize *which* factors exert influence, but also *how* these factors exert their influence is theoretically important and can assist researchers in finding and understanding theoretical boundary conditions imposed by the extent of their influence.

While these factors were limited to three categories in this dissertation, each category is comprised of various influential factors which can draw upon many theories.

For example, much of the economic factors (e.g. market attractiveness, entrepreneur experience, etc.) discussed in this dissertation would act as signals indicating investment quality. Therefore, signaling theory (Akerlof, 1970; Leland & Pyle, 1977; Spence, 1973; Spence, 1976) could be applied and extended in this context. Angel characteristics (e.g. investor industry experience, investor investment experience, etc.) also draw upon theories such as behavioral decision theory (Edwards, 1961; Slovic, Fischhoff, & Lichtenstein, 1977) to explain the influences of experience on perception and decision making and behavioral portfolio theory (Shefrin & Statman, 2000) which can be used to explain investor actions in regard to their existing portfolio of investments. Finally, the non-economic factors which exert influence in this model may have the most theoretically diverse underpinnings. Non-economic factors could draw upon and extend a number of theories including social networking theory (Burt, 1984; Granovetter, 1973) to explain the impact of social ties, emotional contagion (Barsade, 2002; Schoenewolf, 1990) to explain passion and enthusiasm transmission, and theories of being societally or personally beneficial (Branson, 1976; Terpstra & Olsen, 1982) to name a few of the many theoretical applications.

Practical Implications

There are several practical implications of the model proposed in this dissertation. First, I articulate a better idea of how angel investment occurs is presented. This improves on existing models, which are mainly based on VC investment (e.g. Tyebjee & Bruno, 1984), by incorporating additional factors which affect the perceptions of entrepreneurial investment opportunities and the likelihood of investor investment. Specifically, I include non-economic factors and angel investor characteristics into the

model presented. In doing so, I account for the more subjective nature of angel investment (Aernoudt, 1999; Baty & Sommer, 2002; Morisette, 2007) is accounted for. This includes a more comprehensive model which to date has been absent as studies have only have offered very simple empiric studies of certain components of the model. By modeling a more complete picture of angel investing, angels, entrepreneurs, and researchers can gain a better understanding of not just which factors exert influence on angel investor perceptions and venture funding, but exactly how they are exerting influence. This will aid angels in understanding their own decision making behavior, entrepreneurs in understanding angels and their decision making therefore aiding entrepreneurs in securing financing, and researchers interested in the actions of both parties.

Limitations

While this model builds on existing research and simpler models of investment, it also presents a uniquely original full perspective of angel investment and the perceptions that influence it. Empirical verification is another limitation of this proposed model as the sample population this model applies to is notoriously private and data about this segment of investors is very difficult to attain. Additionally, while the arrangement of the components of the model may make intuitive sense, additional empirical and theoretical support would strengthen some of the assertions underlying this model. However, as the full model can incorporate multiple theoretical lenses additional complexity is added and it may be more appropriate for researchers to examine the model in pieces.

Future Research

Future research in this area has two main directions to pursue. First, theoretical extension and justification of the relationships proposed in this model is necessary. Not only will deeper theoretical examination improve the confidence in the model itself, but it will also allow researchers to identify which contexts this model holds up and where it does not. This model and the angel investment context also gives researchers an opportunity to test existing theories boundary conditions as well as an opportunity to build on or develop new theories to assist in explaining the phenomenon of angel investing which this model attempts to explain.

Second, empirical testing of the relationships proposed is necessary to verify the models validity. Without rigorous empirical support, this model is a proposed set of relationships with nothing more that arguments to support its value. Future researchers should strive to acquire information on angel investors to test this model or at least components of it. Despite the challenges researchers face when attempting to collect data on these investors and their investments, it is imperative that questions about how these and other influential factors affect their perceptions and likelihood of investment are answered.

CONCLUSION

How investors perceive, evaluate, and eventually decide whether to invest or not is an important aspect of entrepreneurial financing. Angel investors, in particular, are of great significance as they are often the bridging financiers assisting entrepreneurial ventures with growth capital until they are large and proven enough to warrant VC investment. Despite the importance of angel investors to entrepreneurial ventures,

research in the area is lacking the empirical and theoretical rigor necessary to fully understand these unique investors. This dissertation presents a model, based on VC investment, which also accommodates to the more subjective criteria observed in angel investment.

After proposing a more flexible model which is more appropriate for the context of angel investors, I propose the notion of a hurdle rate consisting of the angel investor's acceptable perceived risk and expected return of the investment through which the model can be visualized. Several influential factors can move the angel's perception of the investment opportunity, through perceived risk and/or expected return, or the investor tolerable levels of risk and return, the hurdle rate, which influence the likelihood that the venture receives funding from the investor. This model incorporates both economic factors, angel characteristics, and non-economic factors which exert influence on the angel investor's perceptions of the investment opportunity in different ways. By examining the angel investor's perceptions, this model and the accompanying visualization offer a more accurate picture can be obtained of how angel investment occurs.

CHAPTER 3:

FACTORS INFLUENCING AN ANGEL'S INVESTMENT PERCEPTIONS

ABSTRACT

Entrepreneurial ventures in search of funding often seek the assistance of angel investors – an understudied segment of entrepreneurial financiers. I examine how the likelihood of an entrepreneurial venture receiving funding is influenced by an angel investor's perceptions of risk and return. Using survey data from 203 angel investors and investments, I find that expected return and not perceived risk drives angel investment which runs contrary to much of the investment literature. Additionally, I find that subjective factors such as enthusiasm, personal relevance, social ties, and risk aversion moderate these relationships enabling entrepreneurs to have a greater chance of securing funding. These findings offer insights into an understudied context while offering practical applications and extending theoretical knowledge in decision making under extreme uncertainty.

INTRODUCTION

Several factors have the ability to influence the angel investor's perception of value of investment in an entrepreneurial venture. Extant research suggests that the investor's perceived risk and expected return are two major factors considered when making an investment with perceived riskiness being negatively related to investment and expected return being positively related to investment (Ganzach, 2000; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). In addition to these two major factors there are many other potential influential factors which have an impact on how the angel investor

perceives the venture investment value. These factors also influence the probability of angel investment as these investors are characterized as basing decisions on more subjective criteria (Aernoudt, 1999; Baty & Sommer, 2002; Morissette, 2007).

By testing a model which incorporates economic considerations, investor characteristics, and non-economic considerations of the investment, I provide a clearer idea of not only what influences angel investor perceptions and investment, but how these factors exert their influence. In addition to directly affecting an angel's perception of venture investment, a second possible route of influence is through affecting factors which have already been identified as influencing investment, namely the two primary drivers of the investment decision – perceived risk and expected return. These two factors are at the core of an investor's investment decision (Ganzach, 2000; Van Osnabrugge, 2000), yet each is distinct and can be influenced by differentially by influential factors. These factors may influence the angel investor's perceived risk, expected return, or both to vary. This dissertation attempts to not only empirically examine factors that influence the likelihood of receiving investment, but also how these factors exert influence on investor perceptions.

To account for the variety in these influential factors, several theoretical lenses are necessary to accurately understand angel investors' decision making. I separate influential factors into three segments, economic factors (business quality and leadership quality), investor characteristics (experience, portfolio diversification, and risk aversion) and non-economic (personal relevance, enthusiasm, and having a social tie) as each exerts influence in a different fashion. In the following sections I explore each of the influential factors in greater detail as well as the theoretical perspective most appropriate

for understanding how and why each factor influences the angel investor's decision making the way it does.

THEORIES AND HYPOTHESES

Quality of the Business and its Leadership

Several economic factors have the ability to influence the angel investor's perceived risk of investment in the venture as well as the expected return on the investment in the venture. These influential factors are communicated (signaled) to the angel investor(s) either directly by the venture and its employees or indirectly through other routes (documentation, market, individuals outside the venture, etc.). Signaling accomplished through communication can alter information discrepancies affecting the level of information asymmetry between the investor and the investment (Akerlof, 1970; Leland & Pyle, 1977; Spence, 1973; Spence, 1976). Signaling in this manner works by having a sender, intentionally or unintentionally, communicating information in some way which is then received and interpreted by a receiver (Connelly, Certo, Ireland, & Reutzel, 2011). The venture funding "pitch" or presentation is one major source of information which, if effectively communicated, has been found to influence investor decision making (Clark, 2008). Regardless of signal source, individuals aggregate the signals they receive using their interpretations of this information to make decisions (Fombrun & Shanley, 1990). By affecting either perceived risk, expected return, or both, these influential factors can influence how the investment opportunity is viewed by the angel, increasing the likelihood of it receiving funding. The factors with the greatest ability to influence angel investors or to allow the entrepreneur to signal the financial potential of the entrepreneurial venture are the quality of the business and its leadership.

Business Quality

This factor encompasses both the venture's product and the potential market. Businesses with products that are perceived to have more potential due to uniqueness, superior quality, and greater perceived value have the ability to garner more interest from investors (Payne, et. al., 2009; Payne & Macarthy, 2002; Sudek, 2006/2007). In addition to the product, the investors perception of market characteristics can also influence the investor's decision to invest in the venture (Payne, Davis, Moore, & Bell, 2009; Payne & Macarty, 2002). Mason and Harrison (1996) found market related factors to be the second most prevalent reason for angels rejecting financing proposals. These factors include intensity of the existing competition, the size of the market, the nature of the marketing plan, and forecasted future growth (Fiet, 1995; Tyebjee & Bruno, 1984). Additionally, greater potential margins, the existence of partnerships (suppliers, buyers, etc.), and name recognition signal overall business quality to investors (Fried & Hisrich, 1994).

Greater business quality can impact both the angel's perception of risk and expected return. Greater business quality can reduce the angel investor's *perceived risk* in investing their money in the venture seeking financing. For example, if the market in which the venture operates is perceived to be less hostile or their product unique, then venture failure is perceived to be less of a possibility and an investment in such a venture would be perceived as being less risky and hence more appealing to an angel investor. In sum, greater business quality in the entrepreneurial opportunity, as perceived by the angel investor, reduces their perceived risk of investment in the venture. As a result, holding all else equal, for a given level of expected return, the angel's perception of the

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business's potential will reduce their perceived risk of the venture, increasing their willingness to invest.

> *Hypothesis 1a: The angel investor's perception of the business quality will be*
> *negatively related to the angel investor's perceived risk of the investment in the*
> *venture.*

The angel investor's perception of the entrepreneurial opportunity will also affect their *expected return* on the investment in the venture and subsequently the decision to invest. For example, if the competition is weak or currently not present or if the name recognition of the product was significant, even risk-averse angels may invest, as the expected growth and future returns appear to be high enough to warrant investment. Higher perceived business quality will lead to greater expected returns. Holding all else equal, at a given level of perceived risk, a venture in which the angel investor perceives entrepreneurial opportunity to be greater, will be perceived by the angel investor to have a greater expected return on investment, and thus have a higher likelihood of receiving funding compared to a venture that the angel investor perceives to have less business potential.

> *Hypothesis 1b: The angel investor's perception of the business quality will be*
> *positively related to the angel investor's expected return of the investment in the*
> *venture.*

Leadership Quality

The perception of leadership quality of the venture is a critical component to be considered when evaluating a venture (Tyebjee & Bruno, 1984; Payne et. al., 2009; Payne & Macarthy, 2002). Leadership quality consists of several factors related to the

individual entrepreneur or professional management team currently leading the venture (Feeney, Haines, & Riding, 1999; Fried & Hisrich, 1994; Mason & Harrison, 1996). Leadership quality consists of both industry and business experience (Mason & Stark, 2004) as well as entrepreneur education and prominence (Kirsch, et. al., 2009).

The angel investor's perception of leadership quality is another factor capable of influencing the angel investor's *perceived risk* of the investment in the venture and the subsequent venture financing decision. For example, ventures with leaders who are perceived to be of higher quality and competency decrease an angel investor's concerns about investing. Therefore, holding all else equal, at a given expected return level, a venture which is perceived by an angel investor to have higher quality leaders will have a lower perceived risk, thus increasing the likelihood of securing financing.

> *Hypothesis 2a: The angel investor's perception of the quality of the leadership quality will be negatively related to the angel investor's perceived risk of the investment in the venture.*

The angel investor's perception of leadership quality also influences the angel investor's *expected return* on the investment in the venture. Higher perceived leadership quality will make investment in the venture more attractive it can bolster the angel's expected return on investment in the venture. Holding all else equal, at a given perceived risk level, an angel investor who perceives the venture's quality of leadership to be higher will also expect the return on investment to be greater. Thus increasing the likelihood of securing the angel investor financing.

Hypothesis 2b: The angel investor's perception of the quality of the leadership quality will be positively related to the angel investor's expected return on the investment in the venture.

Angel Characteristics

Economic characteristics of the entrepreneurial venture are not the only source of influence which affect angel investor perceptions of their investment opportunities. Characteristics of the angel's themselves can affect their perceptions of the entrepreneurial investment opportunity. To date, studies have incorporated several investor characteristics, particularly those relating to their experiences, which affect their perceptions as well as their investment decisions (Lahti, 2011b; Van Osnabrugge, 1998). One way in which angel investor characteristics can affect how an investor interprets the relationship between economic factors and the perceived risk and/or return.

Experience

Behavioral decision theory explains how investor experience can influence how an investor perceives current investment decisions and their eventual decision to invest or not (Edwards, 1961; Slovic, et al., 1977). Investors' previous experiences can impact how investors perceived a venture and the decisions they make. This is because they bring with them unique knowledge. One way in which angels experiences can exert influence is by affecting the relationships between economic factors (e.g. entrepreneurial opportunity, entrepreneurial leadership, etc.) and the perceptions of risk.

The angel investor's experience is capable of influencing the angel investor's *perceived risk* of the investment in the venture and the subsequent venture financing decision. For example, investors with significant investing experience may feel more

confident about their assessment of risk. A venture with leaders who are perceived to be of lower quality and/or a business opportunity which is perceived to be less favorable would warrant a higher perceived risk. However, the angel investor, having extensive background in investing would be more confident regarding the risks due to their experiential knowledge. Therefore, holding all else equal, the relationship between economic factors and perceived risk is affected resulting in a lower perceived risk for a given perception of economic factors with greater angel investor experience in that industry.

> *Hypothesis 3a: The angel investor's experience in 1) investing, 2) the industry, and 3) as an entrepreneur will negatively moderate the relationship between economic factors and perceived risk such that more experience will result in a lower risk perception.*

In addition to affecting the relationship between economic factors and perceived risk, angel investor experience can affect the relationship between economic factors and expected returns. For example, greater experience as an entrepreneur may make the investor more comfortable in an entrepreneurial investment context and more confident about expected returns despite the venture having poor business potential and/or leadership which would imply a lower expected return because the lack of quality leadership would suggest a lack of ability to capitalize on the entrepreneurial opportunity. Therefore, holding all else equal, the relationship between economic factors and expected return will be positively moderated by greater experience by the angel investor as they are more confident in their at ability to create a higher return if involved in the entrepreneurial investment.

Hypothesis 3b: The angel investor's experience in 1) investing, 2) the industry,

and 3) as an entrepreneur will positively moderate the relationship between

economic factors and expected return such that more experience will result in

heightened expectations of return.

MODEL 1

Model of Perceived Risk and Expected Return
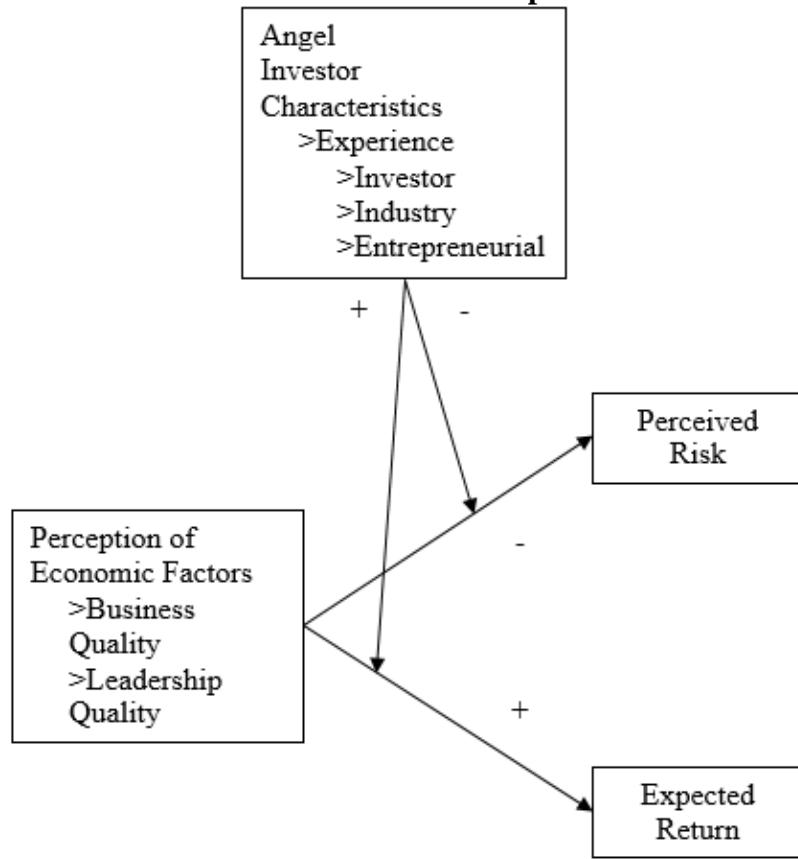
Risk, Return, and Investment

The investor's perception of the investment opportunity is what drives

investment. Two often cited main drivers of how investors view an investment

opportunity are the investor's perceived risk of the investment and the expected return on

the investment. Holding all else equal, investments which are perceived to have lower

risk level will be preferred to those with higher perceived risk levels at the same level of expected return. Likewise, holding all else equal, investments which have a higher expected return will be preferred to those with lower expected returns at the same risk level.

Perceived Risk

The investor's perception of the level of risk of the entrepreneurial investment opportunity is one major criteria which investors consider with regard to investment in a venture (Ganzach, 2000; Maula, Autio, & Arenius, 2005; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). Ventures perceived to be less risky will have a higher likelihood of securing investment from investors (Ganzach, 2000; Tyebjee & Bruno, 1984; Van Osnabrugge, 2000). Reducing the level of risk associated with a venture not only aides in securing investment (Cumming, Fleming, & Schwienbacher, 2005), but also reduces the need for post-investment monitoring and control measures (Barney, Busenitz, Fiet, & Moesel, 1989; Gompers, 1995; Sapienza & Gupta, 1994). Entrepreneurial ventures are typically more risky investments than other options (e.g. stocks, money market, etc.) (Mason & Harrison 2002). Therefore, holding all else equal, at a given expected return level, a venture investment that the angel perceives to have higher risk will have a lower likelihood of being funded compared to a venture investment with a lower perceived risk.

Hypothesis 4a: The angel investor's perceived risk of the investment opportunity will be negatively related to the angel's investing in the venture.

Expected Return

The expected return on investment in the entrepreneurial opportunity is another major criterion investors consider (Ganzach, 2000; Tyebjee & Bruno, 1984; Van

Osnabrugge, 2000). Financial reward is necessary due to the inherent uncertainties associated with the entrepreneurial venture investments (Mason & Harrison, 2002). Typically, with greater risk, a higher expected rate of return on investment is necessary to persuade investors to invest (Baker & Haslem, 1974; Nagy & Obenberger, 1994; Sudek 2006/2007). Additionally, larger returns compensate for the illiquid position they will be taking (MacMillan, Zemann, & Subbanaransimha, 1987). Investors are therefore more likely to choose to invest in ventures in which they anticipate a higher expected return (MacMillan, Seigel, & Narasimha, 1985; Robinson, 1987; Tyebjee & Bruno, 1984). Therefore, holding all else equal, at a given perceived risk level, a venture investment that the angel expects to have greater return will have a higher likelihood of being funded compared to a venture investment with a lower expected return.

    Hypothesis 4b: The angel investor's expected return on the investment

    opportunity will be positively related to the angel's investing in the venture.

Non-Economic Factors

    In addition to the angel investor's perceptions of several economic factors and their own characteristics, the angel investor's perceptions of several important non-economic factors also affect their funding decision. However, in addition to their direct effects, these non-economic factors exert their influence through moderation of the relationships leading to the investment decision. By influencing the relationship between perceived risk and the likelihood of investment and/or the relationship between expected return and likelihood of investment, they have the ability to increase the likelihood of the venture securing financing from the angel investor. The personal relevance of the venture to the angel is examined by applying theory involving investor social

responsibility (Branson, 1976; Terpstra & Olsen, 1983), enthusiasm is examined through an emotional contagion lens (Barsade, 2002; Schoenewolf, 1990) and social ties are examined using social network theory (Burt, 1984; Podolny & Baron, 1997).

Personal Relevance

Investment decisions have been found to be influenced by the personal importance which the investors place on the venture and/or its products (Nagy & Obenberger, 1994). In fact, investor social responsibility theory argues that investors should and do consider their own perceptions of subjective societal benefit and personal relevance when investing (Branson, 1976; Terpstra & Olsen, 1983). Some venture characteristics which could make the project more relevant to the investor include being environmentally responsible, protecting individuals (both workers within the venture and community members in general), or through the venture's products (e.g. a cancer treatment) (Brettel, 2002; Brettel, 2003). In interviews, one angel said that they would invest if they had "familiarity with the concept" while another said they would invest if the opportunity was "a legitimate investment good for the community."

Personal relevance can influence an angel investor's *perceived risk* of the investment and their decision to invest in the venture. As the angel investor's perception of the venture's personal relevance increases, the angel is more inclined to tolerate greater perceived risk as the risks associated with the investment are worth the personal relevance created (e.g. investing in green energy). Therefore, holding all else equal, at a given perceived risk level, a venture which an angel investor perceives to have greater personal relevance will have a higher likelihood of securing funding compared to a venture which the angel does not perceive to have as great a level of personal relevance.

Hypothesis 5a: The angel investor's perception of personal relevance of the venture will increase the acceptable risk the angel is willing to tolerate for that investment by positively moderating the negative acceptable risk-investment relationship.

The relationship between the angel investor's *expected return* and their likelihood of investment in the venture is also influenced by their perception of the venture's personal relevance. For example, a venture that provides safe and well-paying jobs to community members, or produces an environmentally friendly product may offer a below normal level of expected return, but the venture may be funded so that it may provide these benefits, resulting in intrinsic value for the investor. Therefore, holding all else equal, at a given expected return level, a venture which is perceived to have greater personal relevance by an angel investor will have a higher likelihood of securing financing.

Hypothesis 5b: The angel investor's perception of personal relevance of the venture will lower the acceptable return of the angel for that investment by positively moderating the positive acceptable return-investment relationship.

Enthusiasm

Emotions can be transferred amongst individuals through emotional contagion (Barsade, 2002). An angel investor's perception of the positive emotional excitement level generated by the venture, even if unfounded, influences the investment decision. Excitement about a venture can be achieved as venture presenters enthusiastically transfer excitement about the venture to the angel investor(s) or as angels agglomerate and discuss investment opportunities spreading excitement amongst each other.

Entrepreneur enthusiasm and management team passion were two of the top criteria angels used when determining investment decisions, although their effects may not be direct (Cardon, Sudek, & Mitteness, 2009; Mitteness, Sudek, & Cardon, 2012; Sudek, 2006/2007). Passion, which can result from excitement (Vallerand, Blanchard, Mageau, Koestner, Ratelle, Léonard, Gagné, & Marsolais, 2003) was also found to be positively related to venture growth (Baum & Locke, 2004). Even the business plan has the ability to "communicate excitement" (Douglas & Shepard, 2002). The angel investor's perception of excitement is able to affect the relationship between the angel investors' *perceived risk* and their likelihood of investment in the venture. For example, greater excitement perceived by the angel investor pertaining to the venture may result in less concern being given to the perceived risk of the investment in the venture. The angel, in essence, gets caught up in the emotional whirlwind which has been generated and makes investment decisions influenced by such emotions. The result of this is that holding all else equal, at a given perceived risk level, a venture which the angel investor perceives to have created a greater level of excitement for either the entrepreneur or the angel investors has a higher likelihood of securing financing compared to a venture which the angel investor does not perceive the same level of excitement.

> *Hypothesis 6a: The angel investor's perception of the level of a) entrepreneur enthusiasm and b) other investor enthusiasm about the venture will increase the acceptable risk the angel is willing to tolerate for that investment by positively moderating the negative acceptable risk-investment relationship.*

The angel investor's perception of the level of excitement generated about the venture also has the ability to influence the relationship between the angel investor's

expected return and their likelihood of investment in the venture. An example of this would be an angel funding a venture which they would normally, not merely because their friends are, a "following the herd" argument. Therefore, holding all else equal, at a given expected return level, a venture which the angel investor perceives to have generated more excitement, either derived from the entrepreneur or other investors, will have a higher likelihood of securing financing than an venture which is not perceived to be as exciting.

> *Hypothesis 6b: The angel investor's perception of the level of a) entrepreneur enthusiasm and b) other investor enthusiasm about the venture will lower the acceptable return required by the angel for that investment by positively moderating the positive acceptable return-investment relationship.*

> ***Social Ties***

Social ties between investors and entrepreneurs of the venture seeking financing are a valuable resource and influence investor decision making (Nagy & Obenberger, 1994). Strong ties are often generated between individuals as they know each other longer, do more activities together, and develop closer relationships (Burt, 1984; Podolny & Baron, 1997). Investors rely to a great extent on relationships to mitigate agency problems (Fiet, 1995). Strong ties are often manifested as positive ties as individuals would be unlikely to be close to those they perceive negatively (Oh, Labianca, & Chung, 2006). Angels who have ties to an entrepreneur possess greater familiarity and increased trust with those entrepreneurs and increased knowledge of the entrepreneur's capabilities which can also affect the likelihood of receiving investment (Shane & Cable, 2002; Shane & Stuart, 2002).

Thus a tie or ties can influence the relationship between the angel investor's *perceived risk* and their decision to invest. The relationship with a member of the entrepreneurial team would result in the angel investor being more inclined to take risk that they would otherwise avoid. Additionally, by knowing an individual within the venture the angel investor feels that the investment is a safer bet as they trust the individual to a greater extent than someone whom they do not know. Therefore, holding all else equal, at a given perceived risk level, a venture having a tie to the angel will have a higher likelihood of receiving funding compared to a similar venture without the tie.

> *Hypothesis 7a: The presence of a tie between an angel investor and a member of the venture will increase the acceptable risk the angel is willing to tolerate for that investment by positively moderating the negative acceptable risk-investment relationship.*

The presence of a tie to a member or members within the venture also affect the relationship between the angel investor's *expected return* and their likelihood of investment in the venture. An angel investor with a tie to an entrepreneur would be more willing help out and to accept a lower level of expected return from that investment for that individual versus an individual who they do not know or do not care for. Therefore, holding all else equal, at a given expected return level, ventures having the connections to angel investors are at a distinct advantage as an angel will be more inclined to fund a venture with the tie compared to a venture lacking such a tie.

Hypothesis 7b: The presence of a tie between an angel investor and a member of the venture will lower the expected return required by the angel for that investment by positively moderating the positive acceptable return-investment relationship.

More Angel Characteristics

In addition to affecting how angel investors perceive the relationship between economic factors and the perceived risk and/or return, other angel characteristics can affect another set of relationships. Angel characteristics such as the investor's investment portfolio characteristics (Nagy & Obenberger, 1994) and the investor's level of risk aversion (Freear, et al., 2002) have a bearing on the investment decision. The way these angel characteristics can exert influence is by moderating the relationship between perceived risk and investment as well as expected return and investment.

Portfolio Risk

An investor's current portfolio of investment is another factor which may affect how they perceive entrepreneurial investment opportunities and investment decisions. Behavioral portfolio theory (Shefrin & Statman, 2000) details how the investor's existing portfolio is another influential factor affecting the investor and investment. As more traditional investment theories are built around the idea of a rational investor who is always risk averse, behavioral portfolio theory accounts for how investors tailor their portfolios in accordance with their personal subjective preferences (Statman, 1999).

An angel investor's portfolio of investments, including angel invested ventures, is another factor which can affect how angel investor perceives investing. However, unlike their experience, which affects how their perceptions of risk and/or return by affecting the

economic factor relationships leading to them, the angel investor's portfolio affects their likelihood of investment by influencing the acceptable level of risk and/or return. In other words, the relationship between the angel investor's *perceived risk* and their likelihood of investment in the venture is also influenced by their investment portfolio's current risk level. For example if an angel investor has a more diversified portfolio of investments, they may be more inclined to invest in an entrepreneurial venture as their tolerance to risk is greater due to lower portfolio risk. Therefore, a venture may receive funding at a higher risk level than normally acceptable due to the investor's current risk tolerance. Holding all else equal, at a given perceived risk level, a venture will have a higher likelihood of securing financing from angel investors with more diversified portfolios.

> *Hypothesis 8a: The investor's portfolio risk will increase the acceptable risk the*
> *angel is willing to tolerate for that investment by positively moderating the*
> *negative acceptable risk-investment relationship.*

In a similar manner, the relationship between the angel investor's *expected return* and their likelihood of investment in the venture is also influenced by their existing degree of portfolio diversification. Angel investors may be more willing to accept a lower level of expected return on their investment if they already have a diversified portfolio of investments. For example, a venture may be funded at a lower level of expected return than what the angel would normally accept due to their portfolio being diverse enough to accommodate for and potentially take a loss from investment in the entrepreneurial venture. Therefore, holding all else equal, at a given expected return

level, a venture will have a higher likelihood of securing financing from angel investors with diversified portfolios.

> *Hypothesis 8b: The investor's portfolio risk will lower the acceptable return of the angel for that investment by positively moderating the positive acceptable return-investment relationship.*

Risk Aversion

An investor's level of risk aversion is another factor which can affect their perceptions of investment opportunities and the actions they take regarding them. An investor's risk seeking investment behavior, the opposite of risk aversion, will dictate the likelihood of investment in entrepreneurial ventures. How risk loving an investor is can be explained by both behavior decision theory (Edwards, 1961; Slovic, et al., 1977). This theory suggests that how risk seeking an investor is would cause a bias in rational decision making leading to non-optimal decisions. Additionally, behavior portfolio theory (Shefrin & Statman, 2000) suggests that riskiness is one personal characteristic which influences investors when building their investment portfolio.

An angel investor's level of risk seeking investment behavior would influence the relationship between the angel investor's *perceived risk* of investment in the venture and their likelihood of investment in the venture. As the angel investor's desire for risk increases, the angel is more inclined to tolerate greater perceived risk. Therefore, the angel investor's risk inclination influences the angel investor's *acceptable risk* of investment in the venture increasing the likelihood of investment in the venture.

Hypothesis 9a: The investor's risk inclination will increase the acceptable risk the angel is willing to tolerate for that investment by positively moderating the negative acceptable risk-investment relationship.

The relationship between the angel investor's *expected return* and their likelihood of investing in the venture is also influenced by the investors risk inclination. More risk loving angel investors may be more willing to accept lower levels of expected return on their investment as they are more interested in a safer investment. For example, a risk loving angel would be more inclined to invest in a venture with a lower level of expected return compared to an angel who is more risk averse as they may be less concerned with potential financial loss. Therefore, holding all else equal, at a given expected return level, a venture will have a higher likelihood of securing financing from angel investors who are more risk inclined.

Hypothesis 9b: The investor's risk inclination will lower the acceptable return of the angel for that investment by positively moderating the positive acceptable return-investment relationship.

Model of Investment
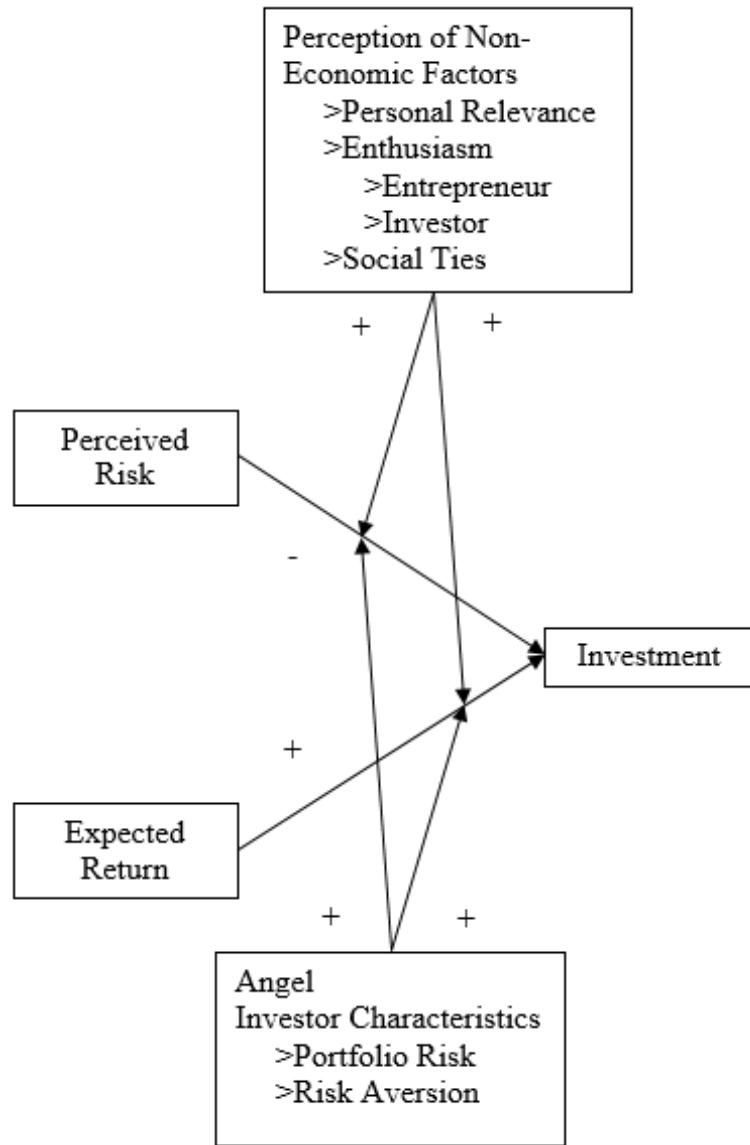
DATA AND METHODS

Sample

During 2013 and 2014 I attended four angel investor meetings with three different

angel groups and conducted semi-structured interviews with ten angel investors. From

these initial experiences the research questions were fine-tuned and an approach to data

collection was decided. A survey was developed to collect data for analyses of the

hypothesized questions. A pre-test of the survey was conducted on one angel group to

ensure the validity of the survey items. Following the successful pre-test the survey was

administered nationwide. Networking through personal and professional connections

was used to identify and reach out to angel investor groups. 257 angel groups across the

country were contacted via email between May 2014 and August 2015. Of these 257

angel groups, 61 (23.74%) acknowledged my request. Additionally, 72 organizations

focused on fostering entrepreneurship (e.g. foundations, public partnerships, etc.) were

also contacted as they may be associated with angel groups. Of these 72, nine (12.50%)

acknowledged my request. Combined the 329 organizations (angel groups and

entrepreneurial organizations) were contacted. 70 (21.28%) organizations acknowledged

my request to survey their members. Of the 70 who acknowledge my request, 39

(55.71%) agreed to pass the survey along to their members and 31 (44.29%) declined to

pass the survey along to their members. 34 of the 39 organizations who agreed were

angel groups and five of those who agreed to pass the survey along were other

entrepreneurially oriented organizations.

Surveys were administered in two ways. First, the 34 angel investor groups who

agreed to participate were asked if they would be willing to have a researcher visit a

meeting and administer hard copies of the survey to members. Of the 34 angel groups

two (5.88%) agreed to let a research attend a meeting and administer the survey in

person. At these two meetings 65 surveys were administered with 46 (70.77%) were

returned and 19 (29.23%) were not returned. Of the 46 returned, 42 (91.30%) were

mostly complete, and four were not complete (8.70%). These 42 surveys which were collected manually comprise 36.84% of the full sample of 114 useable surveys.

   The second method of administering the survey was sending out online links to the survey. Of the 34 angel groups who agreed to pass the survey along 32 (94.12%) did not want a researcher to attend a meeting, however, they agreed to forward an online link to the survey to angel members. The survey was viewed a total of 121 times with 72 (59.50%) being mostly complete while 49 (40.50%) were not completed. The 72 which were mostly completed comprised 63.16% of our full sample of 114 usable surveys.

   The survey asked angel investors to reflect on two investments which they remember well: one in which they invested and a second in which they did not. Additionally, angel investors were asked to answer questions about themselves. Since investors answered on two investments, the full dataset consisted of 217 (103 investors addressed two investments and 11 investors only addressed one investment). Of these 217, 203 had enough complete data to be used in testing the proposed hypotheses. See the Appendix for the full survey.

Variables

Dependent Variables

   Three dependent variables are examined for the analyses of the perceived risk and expected return. The first, *perceived risk* was measured using three items which were measured on five-point Likert scales measuring the responding angel investor's level of agreement with the survey item. Each item was measured on a five-point Likert scale ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items were derived from Hoffmann, Post, and Pennings (2013) and included: 1) Your perceived risk

of investing in this venture was low. 2) You thought this venture was a risk averse investment. 3) You considered investing in this venture to be a safe investment. The Cronbach alpha for this three item measure was .83. The second, *expected return* was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items for this construct were also derived from items used by Hoffmann et al. (2013) to measure expected return. The three items used were: 1) You had a positive feeling about the return expected from investment in this venture. 2) You thought it was likely that investing in this venture would lead to positive returns. 3) Your expected return for an investment in this venture was high. The Cronbach alpha for this three item measure was .93.

Whether the venture received investment was examined in the second analyses. *Investment* was measured as a 1/0 binary indicator variable with 1 representing an investment opportunity in which the angel investor invested and 0 representing an investment opportunity in which the angel investor chose not to invest.

Independent Variables

Two independent variables were the focus of the analyses of perceived risk and expected return. The first, *business quality*, was measured using three items on five-point Likert scales. For each item the Likert scale ranged from one ("Strongly Disagree") to five ("Strongly Agree"). The items were derived from Mitteness, et al. (2012b) and included: 1) This venture had a reasonable exit strategy. 2) This venture's market had large potential for growth. 3) This venture's revenue potential was large. The Cronbach alpha for this three item measure was 0.84. The second independent variable of interest was *leadership quality*. Leadership quality was also measured on three five-point Likert

scale items ranging from one ("Strongly Disagree") to five ("Strongly Agree"). These items were also derived from Mitteness, et al. (2012b) and included: 1) The entrepreneur appeared coachable. 2) The entrepreneur appeared trustworthy. 3) The entrepreneur appeared honest. The Cronbach alpha for this three item measure was 0.83.

Two independent variables were the focus of the analyses of investment. The first variable of interest to this study was *Perceived Risk*. This construct was measured using three items which were measured on five-point Likert scales measuring the responding angel investor's level of agreement with the survey item. Each item was measured on a five-point Likert scale ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items were derived from Hoffmann, Post, and Pennings (2013) and included: 1) Your perceived risk of investing in this venture was low. 2) You thought this venture was a risk averse investment. 3) You considered investing in this venture to be a safe investment. The Cronbach alpha for this three item measure was .85. The second variable of interest was *Expected Return*. This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items for this construct were also derived from items used by Hoffmann et al. (2013) to measure expected return. The three items used were: 1) You had a positive feeling about the return expected from investment in this venture. 2) You thought it was likely that investing in this venture would lead to positive returns. 3) Your expected return for an investment in this venture was high. The Cronbach alpha for this three item measure was .93.

Moderating Variables

Three moderators are hypothesized to affect the relationships when analyzing perceived risk and expected return. All three moderators are experiential characteristics of angel investors assessing the amount of experience they have in three areas. The first moderator is *investing experience*. This was measured by using a single question derived from Wiltbank (2005) and asked: How many years have you been investing in ventures as an angel investor. The second moderator is *industry experience*. This was measured by using a single question derived from Van Osnabrugge (1998) and asked: How many years of experience do you have in your industry of expertise. The third moderator is *entrepreneurial experience*. This was measured by using as single question derived from Pereiro (2001) and asked: How many ventures have you started. These experiential variables have ramifications on investment decision making as they proxy experience in particular realms related to business and investing (Kelly & Hay, 2003).

Six moderators are hypothesized to affect the relationships when analyzing investment. The first four pertain to non-economic subjective characteristics of the investment while the last two pertain to characteristics of the investor. The first moderator is *personal relevance*. This construct was also measured by the angel investor feelings of personal relevance towards the project and consisted of four items adapted from Stephenson, Benoit, and Tschida (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The four items used were: 1) This venture was important to you. 2) This venture was relevant to you. 3) This venture was one that really mattered to you. 4) This venture would have affected you personally. The Cronbach alpha for this four item measure was

.88. The second moderator is *entrepreneur enthusiasm*. This construct was measured by the angel investor's perception of the entrepreneur's enthusiasm and consisted of three items adapted from Cardon, et al. (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The three items used were: 1) The entrepreneur was passionate about the venture. 2) The entrepreneur was enthusiastic about the venture. 3) The entrepreneur demonstrated high energy through body, facial, and vocal actions. The Cronbach alpha for this three item measure was .87. The third moderator is *other investor enthusiasm*. This construct was also measured by the angel investor's perceptions of other investors' reactions towards the investment opportunity and consisted of three items adapted from Cardon, et al. (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The three items used were: 1) Other investors at the presentation appeared to be passionate about the venture. 2) Other investors at the presentation appeared to be enthusiastic about the venture. 3) Other investors at the presentation demonstrated energy through body, facial, and vocal actions. The Cronbach alpha for this three item measure was .90. The fourth moderator is *social tie*. This was measured as a binary indicator variable with 1 indicating the entrepreneur and the investor had met prior to the presentation and had some form of relationship with the individual and 0 indicating that the two had never met prior to the presentation. This follows the work of Burt (1984), Marsden and Campbell (1984), and Wegener (1991) to measure that a connection between two individuals exists. The fifth moderator is *risk aversion* of the investor. This construct was measure using four Likert scale items ranging from one ("Strongly Disagree") to five ("Strongly Agree") which were derived

from Hoffman, et al. (2013) and included: 1) You prefer certainty over uncertainty when investing. 2) You avoid risks when investing. 3) You do not like to take financial risks. 4) You prefer to "play it safe" when investing. The Cronbach alpha for this four item measure was 0.86. The sixth and final moderator was *portfolio risk* which measured the investors perception of risk within their current financial portfolio. This construct was measure using three Likert scale items ranging from one ("Strongly Disagree") to five ("Strongly Agree") which were derived from Hoffman, et al. (2013) and included: 1) Your portfolio of investments is risk averse. 2) You consider your investment portfolio to be safe. 3) Your investment portfolio has little risk. The Cronbach alpha for this three item measure was 0.86.

Control Variables

Several variables were included in the to control for alternative explanations. In the analyses of perceived risk and expected return several variables are accounted for including entrepreneur enthusiasm, other investor enthusiasm, personal relevance, risk aversion, and portfolio risk (see above for variable definitions) while these variables are used as moderators when examining investment.

In both analyses, several investor level characteristics are accounted for to control for alternative explanations. *Gender* was included to account for the sex of the investor. Gender was measured as a binary variable where 1 indicated a female investor and 0 indicated a male investor. *Age* was also accounted for by measuring the investor's age in years. Age has been found to impact investment decision making with some studies finding that risk seeking increases with age (Wang & Hanna, 1997) while others find that it decreases (Morin & Suarez, 1983). *Single* accounted for the investor's familial status.

This variable was measured as a binary indicator with 1 indicating an investor who is single and 0 indicating an investor who is not. Familial status has been found to influence risk as single individuals are more prone to act risky (Chaulk, Johnson, & Bulcroft, 2003). *Caucasian* controlled for ethnic background using a binary variable with investors classifying themselves as Caucasian receiving a 1 and anyone else receiving a 0. Upper level education controlled for investors who possessed an upper level collegiate degree. This was also a binary variable taking a 1 if the investor possessed a Masters or Doctorate degree and 0 if they did not. Not working controlled for the investor's current working situation by using a binary indicator variable with 1 representing an investor who was currently not working and 0 representing an investor who was at least working part time.

Methods

First, exploratory factor analyses (EFA) were conducted on the survey items to ensure that the desired items loaded sufficiently loaded on their constructs. Even though all of the constructs used in this study had been used in previous research, some items were slightly changed to reflect the different context. Additionally, this set of constructs has never been used together before. EFA analyses confirmed that each item loaded sufficiently (>.70) on the expected construct and no other construct (i.e. there was no undesired crossloading of items). All of the constructs loaded as expected with one exception - business quality and expected return loaded on one another. Therefore, these two items are never used in the same model throughout the analyses. Cronbach alphas for all constructs exceeded the .70 level demonstrating adequate reliability (Nunnally,

1978). Interactions involving continuous variables followed the mean centering

recommendations outlined by Aiken and West (1991) to reduce mulicollinearity.

Mixed effects regressions were used when testing the hypotheses as investments

were nested within investors. Therefore multilevel data of this nature includes some

variables are at the investment level and some from the investor level.   Mixed effects

regressions were used when testing the continuous variables of perceived risk and

expected return. Mixed effects binary logistic regressions were conducted to test the

binary dependent variable of whether the investment received financing from the angel

investor.

RESULTS

Descriptive Statistics when Analyzing Risk and Return

Table 1 shows the descriptive statistics and correlations for the variables included

in the analyses of perceived risk and expected return. The average of perceived risk was

2.21/5.00 and the average of expected return was 3.43/5.00. Perceived risk was also

positively correlated with expected return, business quality, investor's passion, personal

relevance, age, and not working. Expected return was positively correlated with business

quality leadership quality entrepreneur passion, investor's passion, and personal

relevance.

Table 1

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Investment Level																			
(1) Perceived Risk	2.21	0.80																	
(2) Expected Return	3.43	1.07	0.32**																
(3) Business Quality	3.91	0.83	0.16*	0.70**															
(4) Leadership Quality	3.88	0.74	0.00	0.31**	0.40**														
(5) Entrepreneur Passion	4.38	0.64	-0.07	0.22**	0.33**	0.41**													
(6) Investors Passion	3.47	0.74	0.15*	0.50**	0.47**	0.32**	0.36**												
(7) Personal Relevance	2.83	0.83	0.23**	0.28**	0.34**	0.26**	0.13	0.25**											
Investor Level																			
(8) Industry Experience	30.79	10.45	0.08	0.04	0.01	0.03	0.03	-0.03	0.10										
(9) Entrepreneurial Experience	3.08	7.06	0.07	0.11	0.07	0.13	0.05	0.00	0.02	-0.07									
(10) Investing Experience	8.81	9.30	-0.06	-0.03	0.02	0.11	0.02	-0.03	0.09	0.29**	0.23**								
(11) Gender	0.06	0.23	-0.09	-0.05	-0.03	0.06	0.08	-0.04	-0.10	-0.20**	-0.03	0.01							
(12) Age	59.82	11.5	0.16*	0.12	0.11	0.12	0.12	0.11	0.16*	0.77**	0.07	0.29**	-0.19**						
(13) Single	0.08	0.27	0.04	-0.07	-0.02	-0.01	0.06	-0.09	-0.03	-0.09	0.01	0.19**	0.23**	-0.16*					
(14) Caucausian	0.95	0.21	-0.02	0.00	0.06	0.03	0.02	0.13	-0.04	0.16*	0.01	-0.09	0.04	0.18**	-0.12				
(15) Upper Level Education	0.61	0.49	0.02	-0.06	-0.03	0.00	-0.08	0.01	0.09	-0.07	-0.19**	0.03	0.03	0.14*	0.09	-0.02			
(16) Not Working	0.43	0.49	0.13*	0.09	0.03	0.05	0.04	0.10	-0.03	0.25**	-0.19**	-0.07	-0.13	0.46**	-0.08	-0.05	0.08		
(17) Risk Aversion	2.45	0.77	0.11	-0.03	-0.06	-0.09	0.05	0.02	0.05	0.03	-0.26**	-0.19**	-0.10	0.04	-0.03	-0.09	0.05	0.18**	
(18) Portfolio Risk	2.66	0.85	0.03	-0.03	-0.05	-0.02	0.02	0.04	-0.01	0.08	-0.15*	-0.06	-0.12	0.15*	-0.03	-0.03	0.10	0.21**	0.28**

Notes: N=203. ** and * indicate statistical significance at the 1% and 5% levels respectively. All tests are two-tailed.

Risk and Return

Table 2 shows the results from hypotheses 1 and 2.

Table 2

Table 2. Mixed Model Regression Results for Risk and Return

	Risk				Return	
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Level						
Intercept	1.01	0.91	1.07	1.00	0.62	0.08
	(0.68)	(0.69)	(0.71)	(0.71)	(0.83)	(0.86)
Business Quality		0.07		0.08		
		(0.07)		(0.08)		
Leadership Quality			-0.03	-0.04		0.23**
			(0.08)	(0.09)		(0.10)
Entrepreneur Passion	-0.21**	-0.22**	-0.20**	-0.21**	0.04	-1.02
	(0.09)	(0.09)	(0.10)	(0.10)	(0.11)	(0.12)
Investors Passion	0.16**	0.13	0.16**	0.13	0.66***	0.63***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)
Personal Relevance	0.17***	0.16**	0.18***	0.17**	0.24***	0.21**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Investor Level						
Gender	-0.09	-0.09	-0.09	-0.08	-0.02	-1.06
	(0.25)	(0.25)	(0.25)	(0.25)	(0.30)	(0.30)
Age	0.01	0.01	0.01	0.01	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Single	0.37*	0.36*	0.37*	0.36*	-0.07	-1.06
	(0.21)	(0.21)	(0.21)	(0.21)	(0.25)	(0.26)
Caucausian	0.21	0.21	0.22	0.22	-0.31	-1.31
	(0.31)	(0.31)	(0.31)	(0.31)	(0.38)	(0.38)
Upper Level Education	-0.12	-0.11	-0.11	-0.11	-0.18	-1.18
	(0.12)	(0.12)	(0.12)	(0.12)	(0.14)	(0.14)
Not Working	0.03	0.03	0.04	0.04	0.08	-0.94
	(0.14)	(0.14)	(0.14)	(0.14)	(0.16)	(0.17)
Risk Aversion	0.15*	0.15*	0.14*	0.15*	-0.05	-1.01
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.10)
Portfolio Risk	-0.02	-0.01	-0.02	-0.01	-0.05	-1.05
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
N	203	203	203	203	203	203
Log Likelihood	-225.64	-225.18	-224.92	-224.34	-269.83	-266.71
Wald Chi-Square	28.28	29.29	28.49	29.79	85.06	93.79
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed. ICC for null risk model = 0.22. ICC for null return model = 0.00.

These hypotheses were primarily incorporated to set up the moderating hypotheses. Hypothesis 1a predicted that the investor's perception of business quality will be negatively related to their perceived risk. As seen in Model 2 of Table 2 this hypothesis was not supported. Hypothesis 1b predicted that the investor's perception of business quality will be positively related to their expected return. This hypothesis could not be tested as the constructs of business quality and expected return loaded on one another and is therefore inappropriate to use one to predict the other. Hypothesis 2a

predicted that the investor's perception of leadership quality would be negatively related to their perception of risk. This hypothesis was not supported as seen in Model 3 of Table 2. Hypothesis 2b predicted that the investor's perception of leadership quality would be positively related to their return expectations. This hypothesis received strong support (B= 0.23, p<0.05) as seen in Model 6 of Table 2.

The moderating effects in Hypothesis 3 were tested in Tables 3 and 4.

Table 3

Table 3. Mixed Model Regression Results for Risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Investment Level									
Intercept	1.15	1.16	1.08	1.14	1.09	1.14	1.11	1.11	1.10
	(0.76)	(0.76)	(0.76)	(0.76)	(0.76)	(0.76)	(0.76)	(0.76)	(0.76)
Business Quality	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.06	0.06
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)	(0.08)
Business Quality x Industry Experience		-0.05				-0.04			
		(0.05)				(0.05)			
Business Quality x Entrepreneurial Experience			-0.17			-0.16			
			(0.11)			(0.12)			
Business Quality x Investing Experience				-0.04		0.00			
				(0.04)		(0.05)			
Leadership Quality	-0.07	-0.07	-0.06	-0.06	-0.06	-0.07	-0.08	-0.07	-0.07
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Leadership Quality x Investing Experience						0.00			0.00
						(0.07)			(0.08)
Leadership Quality x Entrepreneurial Experience							-0.05		-0.04
							(0.10)		(0.11)
Leadership Quality x Investing Experience								-0.02	-0.01
								(0.05)	(0.05)
Entrepreneur Passion	-0.22**	-0.23**	-0.20**	-0.22**	-0.21	-0.22**	-0.21**	-0.22**	-0.21**
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Investors Passion	0.15*	0.15*	0.12	0.14*	0.13	0.15*	0.14*	0.15*	0.14*
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Personal Relevance	0.15**	0.15**	0.15**	0.15**	0.15**	0.15**	0.15**	0.15**	0.15**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Investor Level									
Industry Experience	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Entrepreneurial Experience	0.02*	0.01	0.04**	0.02*	0.03**	0.02*	0.02	0.02*	0.02
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Investing Experience	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender	-0.04	-0.04	-0.02	-0.04	-0.02	-0.04	-0.03	-0.03	-0.03
	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)
Age	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Single	0.39*	0.41*	0.34	0.38*	0.36	0.39*	0.39*	0.39*	0.38*
	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)
Caucausian	0.19	0.19	0.20	0.20	0.20	0.19	0.18	0.19	0.18
	(0.46)	(0.46)	(0.45)	(0.46)	(0.45)	(0.46)	(0.46)	(0.46)	(0.46)
Upper Level Education	-0.05	-0.05	-0.02	-0.05	-0.02	-0.05	-0.04	-0.05	-0.04
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Not Working	0.06	0.05	0.10	0.06	0.08	0.06	0.08	0.06	0.07
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
Risk Aversion	0.15*	0.15*	0.14*	0.15*	0.14	0.15*	0.15*	0.15*	0.15*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Portfolio Risk	-0.01	-0.01	0.00	-0.01	0.00	-0.01	-0.01	-0.01	-0.01
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
N	193	193	193	193	193	193	193	193	193
Log Likelihood	-208.97	-208.52	-207.85	-208.64	-207.52	-208.97	-208.85	-208.90	-208.83
Wald Chi-Square	32.31	33.27	34.91	33.12	35.63	32.30	32.68	32.47	32.69
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed.

Table 4

Table 4. Mixed Model Regression Results for Return

	(1)	(2)	(3)	(4)	(5)
Investment Level					
Intercept	0.65	0.65	0.70	0.54	0.60
	(0.92)	(0.92)	(0.92)	(0.92)	(0.92)
Business Quality	-	-	-	-	-
	-	-	-	-	-
Business Quality x Industry Experience					
Business Quality x Entrepreneurial Experience					
Business Quality x Investing Experience					
Leadership Quality	0.17*	0.18*	0.17*	0.20*	0.21**
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Leadership Quality x Investing Experience		0.04			0.06
		(0.09)			(0.09)
Leadership Quality x Entrepreneurial Experience			0.06		0.15
			(0.12)		(0.14)
Leadership Quality x Investing Experience				-0.05	-0.09
				(0.06)	(0.07)
Entrepreneur Passion	-0.02	-0.02	-0.03	-0.02	-0.04
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Investors Passion	0.67***	0.66***	0.67***	0.66***	0.67***
	(0.09)	(0.10)	(0.10)	(0.09)	(0.10)
Personal Relevance	0.21**	0.21**	0.21**	0.21**	0.21**
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Investor Level					
Industry Experience	0.01	0.00	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Entrepreneurial Experience	0.02	0.02	0.01	0.02	-0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.03)
Investing Experience	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender	0.00	-0.01	-0.01	0.00	-0.01
	(0.31)	(0.31)	(0.30)	(0.31)	(0.31)
Age	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Single	0.08	0.09	0.08	0.05	0.07
	(0.28)	(0.28)	(0.28)	(0.28)	(0.28)
Caucausian	-1.05*	-1.03*	-1.04*	-1.05*	-0.98*
	(0.55)	(0.56)	(0.55)	(0.55)	(0.56)
Upper Level Education	-0.14	-0.15	-0.16	-0.12	-0.16
	(0.15)	(0.15)	(0.16)	(0.16)	(0.16)
Not Working	0.06	0.06	0.05	0.06	0.02
	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)
Risk Aversion	0.03	0.03	0.03	0.04	0.04
	(0.10)	(0.11)	(0.10)	(0.11)	(0.11)
Portfolio Risk	-0.02	-0.02	-0.02	-0.02	-0.04
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)
N	193	193	193	193	193
Log Likelihood	-249.56	-249.48	-249.43	-249.13	-148.36
Wald Chi-Square	101.30	101.64	101.30	103.37	105.53
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed.

Hypothesis 3a predicted that the investor's experience in investing, industry, and as an entrepreneur would negatively moderate the relationship between business quality and perceived risk as well as the relationship between leadership quality and perceived risk. As indicated by the models in Table 3 these hypotheses were not supported. Hypothesis 3b predicted that the investor's experience in investing, industry, and as an entrepreneur would positively moderate the positive relationship between business quality and expected return as well as the relationship between leadership quality and expected return. The interactions between business quality and expected return could not be tested due to both constructs loading on one another. As indicated in the models in Table 4 the hypotheses regarding leadership quality were not significant. These findings are a bit surprising and may be driven by the blunt proxies used for the various forms of experience. Additionally, many of the individual investor level variables were not significant, so it could be that the characteristics of the investment are more influential than the characteristics of the investor when it comes to perceptions of risk and return.

Descriptive Statistics when Analyzing Investment

Table 5 shows the descriptive statistics and correlations for the variables included in the analyses of investment. 60% of investments in this study received investment. This mean may be a little surprising since investors were asked to answer about one investment in which they invested and a second in which they did not. However, approximately 60% of the sample was comprised of observations where ventures had received funding from the angel investor answering the questionnaire. This shows a respondent bias towards answering about ventures in which they invested. Receiving

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investment was also significantly positively correlated with perceived risk, expected return, personal relevance, entrepreneur enthusiasm, and other investors' enthusiasm.

Table 5

Table 5: Descriptive Statistics and Correlations

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Investment Level																
(1) Invest	0.60	0.49														
(2) Perceived Risk	2.21	0.80	0.16*													
(3) Expected Return	3.43	1.07	0.60**	0.32**												
(4) Personal Relevance	2.83	0.83	0.26**	0.23**	0.28**											
(5) Entrepreneur Enthusiasm	4.38	0.64	0.15*	-0.07	0.22**	0.13										
(6) Investors Enthusiasm	3.47	0.74	0.41**	0.15*	0.50**	0.25**	0.36**									
(7) Social Tie	0.23	0.42	0.09	-0.02	-0.01	-0.07	0.08	-0.12								
Investor Level																
(8) Gender	0.06	0.23	-0.01	-0.09	-0.05	-0.10	0.08	-0.04	0.02							
(9) Age	59.82	11.50	0.02	0.16*	0.12	0.16*	0.12	0.11	-0.12	-0.19**						
(10) Single	0.08	0.27	-0.04	0.04	-0.07	-0.03	0.06	-0.09	0.09	0.23**	-0.16*					
(11) Caucausian	0.95	0.21	-0.02	-0.02	0.00	-0.04	0.02	0.13	-0.17*	0.04	0.18**	-0.12				
(12) Upper Level Education	0.61	0.49	-0.02	0.02	-0.06	0.09	-0.08	0.01	-0.01	0.03	0.14*	0.09	-0.02			
(13) Not Working	0.43	0.49	0.09	0.13*	0.09	-0.03	0.04	0.10	-0.16*	-0.13	0.46**	-0.08	-0.05	0.08		
(14) Risk Aversion	2.45	0.77	-0.10	0.11	-0.03	0.05	0.05	0.02	-0.14*	-0.10	0.04	-0.03	-0.09	0.05	0.18**	
(15) Portfolio Risk	2.66	0.85	-0.02	0.03	-0.03	-0.01	0.02	0.04	-0.12	-0.12	0.15*	-0.03	-0.03	0.10	0.21**	0.28**

Notes: N=203. ** and * indicate statistical significance at the 1% and 5% levels respectively. All tests are two-tailed.

Investment

Results of the mixed effects logistic regression was used to test whether the venture received investment. Table 6 shows the results of these regressions.

Table 6

Table 6. Mixed Model Logit Results for Investment

	(1)	(2)	(3)	(4)
Investment Level				
Intercept	-5.97***	-6.21***	-8.32***	-8.17***
	(2.20)	(2.22)	(2.67)	(2.68)
Perceived Risk		0.26		-0.22
		(0.24)		(0.28)
Expected Return			1.39***	1.44***
			(0.24)	(0.25)
Personal Relevance	0.71***	0.65***	0.62**	0.67**
	(0.23)	(0.24)	(0.28)	(0.29)
Entrepreneur Enthusiasm	0.05	0.11	-0.12	-0.17
	(0.29)	(0.30)	(0.34)	(0.35)
Investor Enthusiasm	1.43***	1.40***	0.98***	0.97***
	(0.30)	(0.30)	(0.36)	(0.36)
Social Tie	0.86*	0.83*	1.05**	1.08**
	(0.46)	(0.46)	(0.53)	(0.53)
Investor Level				
Gender	0.31	0.30	0.04	0.06
	(0.73)	(0.72)	(0.84)	(0.84)
Age	-0.01	-0.01	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Single	-0.22	-0.28	-0.22	-0.17
	(0.60)	(0.61)	(0.75)	(0.75)
Caucausian	0.07	0.00	0.76	0.82
	(0.89)	(0.89)	(1.18)	(1.19)
Upper Level Education	-0.08	-0.04	0.16	0.14
	(0.35)	(0.35)	(0.40)	(0.41)
Not Working	0.54	0.54	0.59	0.61
	(0.42)	(0.42)	(0.51)	(0.51)
Risk Aversion	-0.32	-0.35	-0.45	-0.43
	(0.23)	(0.24)	(0.28)	(0.28)
Portfolio Risk	0.06	0.05	0.22	0.24
	(0.21)	(0.21)	(0.26)	(0.26)
N	203	203	203	203
Log Likelihood	-109.22	-108.62	-85.54	-85.23
Wald Chi-Square	36.26	36.73	49.17	49.71
Prob(chi-square)	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed. ICC for null investment model = 0.00.

Surprisingly, Models 2 and 4 indicate that perceived risk is not significant (B = -0.22, p > 0.10), which does not support Hypothesis 4a. As expected, expected return is positive and strongly significant (B = 1.44, p < 0.01) as seen in both Models 3 and 4.

This strong support suggests that expected return is a strong predictor of a venture receiving investment and supports Hypothesis 4b.

The Relationship between Perceived Risk and Investment

Table 7 shows the results of the tests of the interactive effects of the six hypothesized moderators of the relationship between perceived risk and investment.

Table 7

Table 7. Mixed Model Logit Results for Risk and Investment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Investment Level							
Intercept	-8.04***	-8.97***	-8.04***	-8.99***	-8.17***	-7.85***	-9.64***
	(2.71)	(2.76)	(2.69)	(2.76)	(2.70)	(2.69)	(3.02)
Perceived Risk	-0.23	-0.16	-0.26	0.02	-0.12	-0.30	0.17
	(0.28)	(0.29)	(0.29)	(0.31)	(0.29)	(0.29)	(0.37)
Perceived Risk x Personal Relevance	-0.43						-0.57
	(0.33)						(0.35)
Perceived Risk x Entrepreneur Enthusiasm		0.88*					0.95*
		(0.49)					(0.52)
Perceived Risk x Investor Enthusiasm			1.08**				0.53
			(0.45)				(0.48)
Perceived Risk x Social Tie				-1.30**			-1.59**
				(0.65)			(0.77)
Perceived Risk x Portfolio Risk					0.52		0.32
					(0.32)		(0.36)
Perceived Risk x Risk Aversion						0.37	0.15
						(0.32)	(0.37)
Expected Return	1.50***	1.45***	1.49***	1.50***	1.41***	1.47***	1.64***
	(0.26)	(0.25)	(0.26)	(0.26)	(0.25)	(0.25)	(0.29)
Personal Relevance	0.63**	0.74**	0.70**	0.68**	0.63**	0.68**	0.63**
	(0.29)	(0.29)	(0.28)	(0.29)	(0.29)	(0.29)	(0.30)
Entrepreneur Enthusiasm	-0.22	-0.06	-0.16	-0.18	-0.20	-0.19	-0.15
	(0.36)	(0.36)	(0.35)	(0.35)	(0.35)	(0.35)	(0.39)
Investor Enthusiasm	1.01***	1.02***	1.15***	0.98***	1.05***	0.90**	1.24***
	(0.37)	(0.37)	(0.38)	(0.36)	(0.37)	(0.36)	(0.40)
Social Tie	1.09**	1.12**	1.12**	1.10**	1.09**	1.08**	1.05*
	(0.54)	(0.55)	(0.54)	(0.54)	(0.54)	(0.53)	(0.57)
Investor Level							
Gender	0.03	-0.04	0.08	-0.04	-0.02	-0.04	-0.44
	(0.85)	(0.84)	(0.86)	(0.88)	(0.86)	(0.86)	(0.94)
Age	-0.02	-0.02	-0.03	-0.02	-0.02	-0.02	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Single	-0.10	-0.32	-0.31	-0.27	-0.09	-0.15	-0.32
	(0.77)	(0.75)	(0.78)	(0.75)	(0.75)	(0.75)	(0.80)
Caucausian	0.77	0.97	0.69	0.86	0.74	0.95	0.77
	(1.20)	(1.23)	(1.27)	(1.23)	(1.24)	(1.24)	(1.39)
Upper Level Education	0.22	0.05	0.20	0.14	0.15	0.11	0.14
	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.44)
Not Working	0.58	0.47	0.84	0.63	0.62	0.60	0.58
	(0.52)	(0.52)	(0.54)	(0.52)	(0.52)	(0.52)	(0.57)
Risk Aversion	-0.45	-0.45	-0.64**	-0.47	-0.55*	-0.36	-0.69*
	(0.29)	(0.29)	(0.30)	(0.29)	(0.30)	(0.29)	(0.35)
Portfolio Risk	0.26	0.24	0.27	0.22	0.28	0.18	0.31
	(0.27)	(0.26)	(0.26)	(0.27)	(0.27)	(0.27)	(0.30)
N	203	203	203	203	203	203	203
Log Likelihood	-84.43	-83.60	-82.42	-83.14	-83.87	-84.54	-77.35
Wald Chi-Square	48.40	50.52	51.70	49.85	50.97	50.54	50.62
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed.

Hypothesis 5a hypothesized that personal relevance would positively moderate the negative relationship between perceived risk and investment. This hypothesis failed to reach significance in the full model (B = -0.43, p > 0.10). Hypothesis 6a hypothesized that entrepreneur enthusiasm would positively moderate the negative relationship between perceived risk and investment making investment more likely for investors at a similar perceived risk level. This hypothesis was supported (B = 0.88, p < 0.10) in Model 2 and the full model, Model 7. This suggests that high entrepreneur enthusiasm may be beneficial at high risk levels, but not helpful for the entrepreneur at low risk levels. This interaction is plotted in Figure 1.

Figure 1
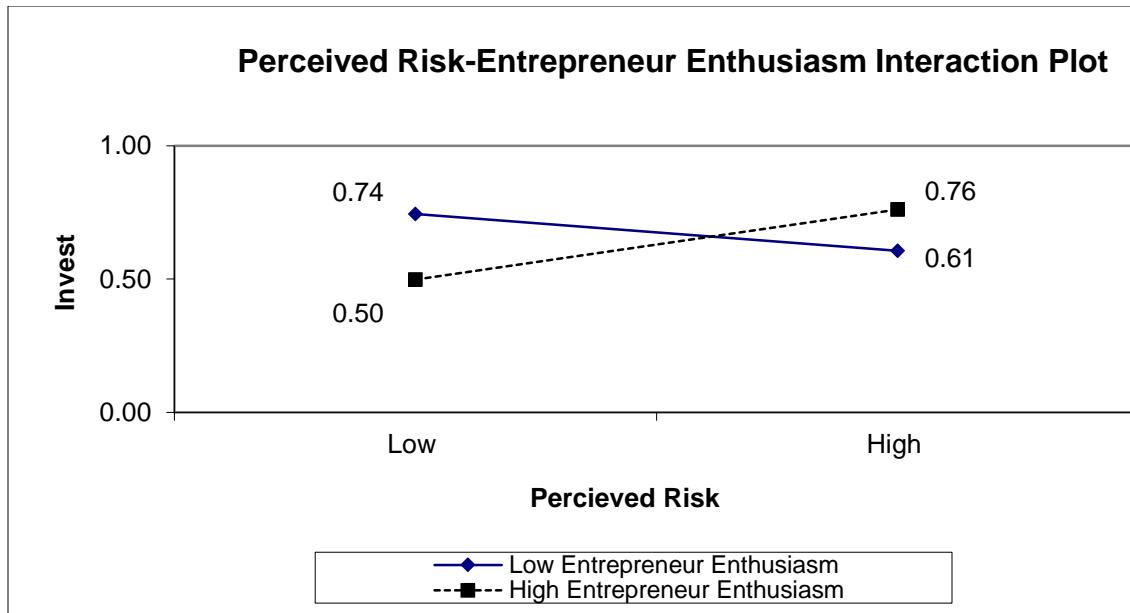
Hypothesis 6a also hypothesized other investor enthusiasm would positively moderate the negative relationship between perceived risk and investment. This hypothesis reached significance in Model 3 (B = 1.08, p<0.05), but not in the full model. Hypothesis 7a hypothesized that a social tie between the entrepreneur and investor would positively moderate the negative relationship between perceived risk and investment.

The moderating effect of a social tie was significantly negative (B = -1.30, p <0.05) in both Model 4 and Model 7. These results suggest that at low levels of perceived risk a social tie may be beneficial, but as perceived risk increases social ties become more detrimental to the entrepreneur securing financing. This may be indicative of investors not wanting to ruin relationships by investing in risky projects. This interaction is plotted in Figure 2.

Figure 2
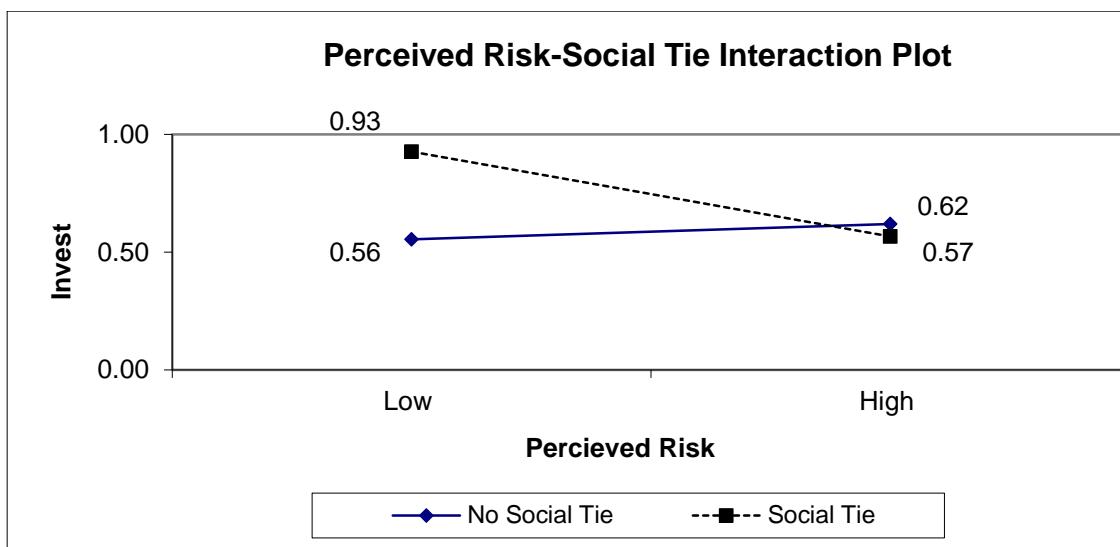
Hypothesis 8a and 9a predicted that the investor's portfolio risk and risk aversion would positively moderate the negative relationship between perceived risk and investment. Neither of these hypotheses were supported.

The Relationship between Expected Return and Investment

Table 8 shows the results of the tests of the interactive effects of the six hypothesized moderators on the return-investment relationship.

Table 8

Table 8. Mixed Model Logit Results for Return and Investment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Investment Level							
Intercept	-8.40***	-8.03***	-8.60***	-8.31***	-8.03***	-8.73***	-10.46***
	(2.75)	(2.84)	(2.80)	(2.68)	(2.71)	(2.72)	(3.33)
Perceived Risk	-0.18	-0.22	-0.21	-0.22	-0.26	-0.25	-0.20
	(0.28)	(0.28)	(0.27)	(0.28)	(0.28)	(0.28)	(0.29)
Expected Return	1.44***	1.54***	1.48***	1.56***	1.49***	1.79***	1.99***
	(0.26)	(0.27)	(0.26)	(0.30)	(0.26)	(0.31)	(0.38)
Expected Return x Personal Relevance	-0.61*						-0.79**
	(0.35)						(0.39)
Expected Return x Entrepreneur Enthusiasm		-0.86*					-0.76
		(0.46)					(0.57)
Expected Return x Investor Enthusiasm			-0.65*				-0.67
			(0.39)				(0.49)
Expected Return x Social Tie				-0.38			-0.32
				(0.49)			(0.58)
Expected Return x Portfolio Risk					0.48*		0.42
					(0.29)		(0.39)
Expected Return x Risk Aversion						1.03***	0.82**
						(0.37)	(0.39)
Personal Relevance	0.78***	0.61**	0.74**	0.64**	0.63**	0.57*	0.77**
	(0.30)	(0.28)	(0.29)	(0.29)	(0.29)	(0.29)	(0.35)
Entrepreneur Enthusiasm	-0.28	-0.25	-0.22	-0.14	-0.21	-0.19	-0.32
	(0.37)	(0.38)	(0.36)	(0.35)	(0.36)	(0.36)	(0.42)
Investor Enthusiasm	1.09***	0.93***	0.94***	0.94***	1.03***	0.93***	1.14***
	(0.39)	(0.37)	(0.36)	(0.36)	(0.37)	(0.36)	(0.42)
Social Tie	1.12**	1.14**	1.09**	0.98*	1.14**	0.88	1.15**
	(0.55)	(0.53)	(0.54)	(0.53)	(0.54)	(0.54)	(0.58)
Investor Level							
Gender	0.13	0.22	-0.03	0.07	-0.04	0.19	0.26
	(0.85)	(0.86)	(0.84)	(0.85)	(0.84)	(0.87)	(0.91)
Age	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Single	-0.47	-0.02	-0.02	-0.20	-0.04	-0.66	-0.67
	(0.77)	(0.77)	(0.77)	(0.74)	(0.78)	(0.76)	(0.83)
Caucausian	0.61	0.77	1.12	0.61	0.86	0.86	0.83
	(1.21)	(1.17)	(1.22)	(1.20)	(1.28)	(1.34)	(1.37)
Upper Level Education	0.16	0.05	0.04	0.14	0.15	0.12	0.08
	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.42)	(0.44)
Not Working	0.69	0.67	0.66	0.63	0.66	0.66	0.83
	(0.53)	(0.52)	(0.52)	(0.52)	(0.52)	(0.53)	(0.56)
Risk Aversion	-0.43	-0.41	-0.44	-0.41	-0.42	-0.50	-0.52
	(0.29)	(0.28)	(0.28)	(0.28)	(0.28)	(0.31)	(0.33)
Portfolio Risk	0.27	0.26	0.25	0.21	0.19	0.26	0.16
	(0.26)	(0.27)	(0.27)	(0.26)	(0.27)	(0.27)	(0.31)
N	203	203	203	203	203	203	203
Log Likelihood	-83.51	-83.17	-83.77	-84.93	-83.87	-80.70	-75.51
Wald Chi-Square	46.76	49.12	46.33	49.39	50.14	47.66	40.44
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two–tailed.

Hypothesis 5b hypothesized that the positive relationship between expected return and investment would be positively moderated by the personal relevance of the venture to the investor. Results in Table 8 indicate the contrary finding. The interaction coefficient was actually significant and negative (B = -0.61, p < 0.10). These findings suggest that personal relevance weakens the relationship between expected return and investment

making securing investment more likely for the entrepreneur if their project has resonated to a greater extent with the angel investor, but only at lower expected return levels. This is plotted in Figure 3.

Figure 3

Expected Return-Personal Relevance Interaction Plot
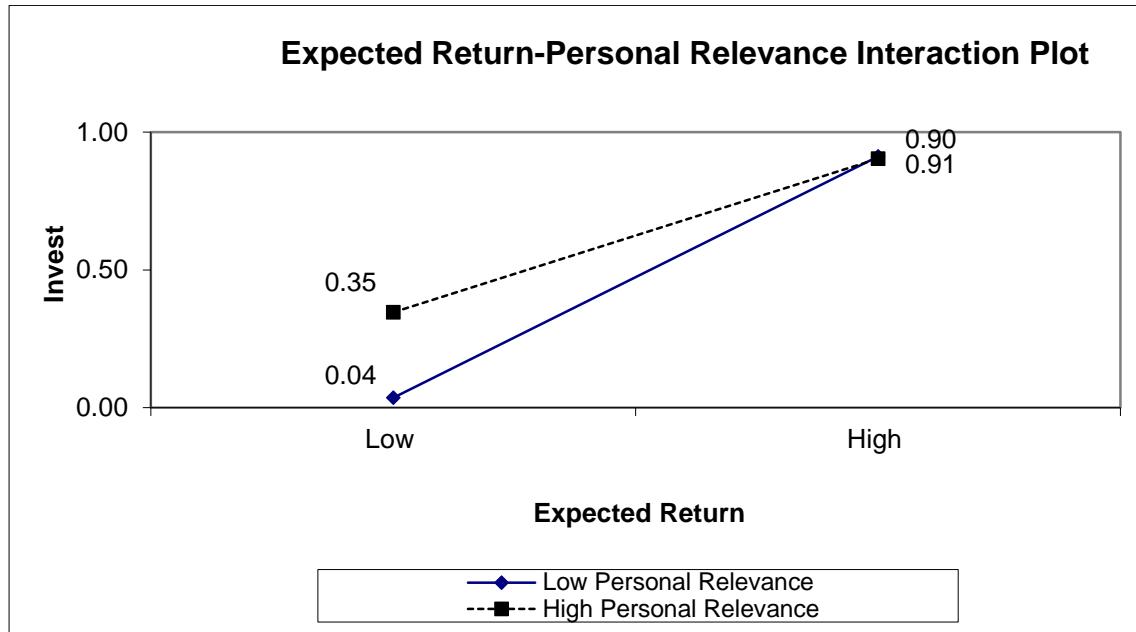
Hypothesis 6b hypothesized that the positive relationship between expected return and investment would be positively moderated by the entrepreneur's enthusiasm allowing entrepreneurs to be more able in securing financing at a given expected return level. Contrary to expectations, the coefficient was marginally significant in a negative direction ($B = -0.86$, $p<0.10$), but these results did not hold in the full model. Additionally, Hypothesis 6b also hypothesized the positive relationship between expected return and investment would be positively moderated by other investors' enthusiasm displayed a marginally significant coefficient ($B= -0.38$, $p < 0.10$), but again these results did not hold in the full model. Hypothesis 7b hypothesized that the positive relationship

between expected return and investment would be positively moderated by the presence of a social tie. This hypothesis was not supported.

Hypothesis 8b predicted the portfolio risk would positively moderate the positive relationship between expected return and investment and Hypothesis 9b predicted that the investor's risk aversion would positively moderate the positive relationship between expected return an investment. Both of these hypotheses were supported as seen in Model 5 (B = 0.48, p<0.10) and Model 6 (B = 1.03, p<0.05) of Table 8, however the interaction between expected return and portfolio risk fails to reach significance in the full model. The interaction, which held significance in the full model, between expected return and the risk aversion of the investor is plotted in Figure 4. This suggests that more risk averse investors are far less likely to invest at lower expected return levels and that these effects go away once higher expected return levels are achieved.

Figure 4
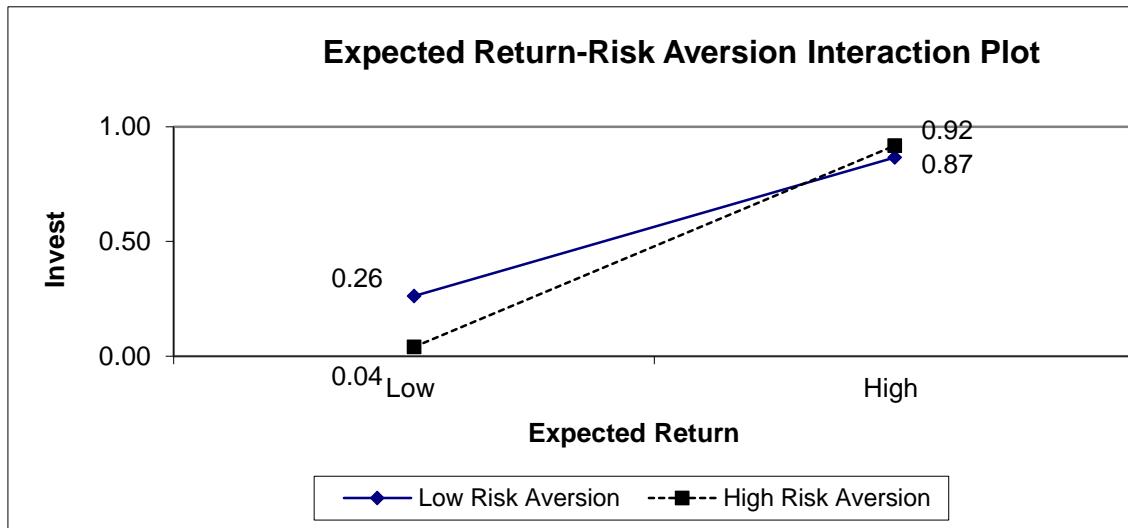
DISCUSSION

Theoretical Contributions

Angel investors are a unique type of investor and there is a growing body of literature articulating the various ways in which angel investors differ from their more researched cousins, VCs. While numbers indicate that angel investors invest in approximately fifteen times the number of entrepreneurial ventures that VCs do, research has lagged in understanding the uniqueness of angel investors. Both theoretically and empirically angel investors operate differently from VCs. As such, assumptions based on VC research must be tested and verified. These findings have implications not only for entrepreneurial financing, but also for other decision making contexts and beyond.

The findings of this dissertation offer many theoretically important implications in the area of entrepreneurial financing. Expected return was very significant for the venture to receive investment, however risk was not significant, which was very surprising. However, this is in line with recent work by Huang and Pearce (2015) who, through a qualitative approach, arrived at a similar conclusion suggesting that the investments in which angel investors invest are so unknown that the risk cannot be defined and so go for the "home run" (high expected return) investments. This is theoretically relevant to understanding the boundary conditions of certain investment criteria. This is contrary to much of the research conducted on VCs, arguably a more sophisticated investing group (e.g. Zider, 1998). It suggests that populations of investors and certain contexts exist where risk is either obsolete or too difficult to assess or estimate and so is disregarded. This is theoretically significant and important not only to an entrepreneurial context, but also has ramifications to other areas of high-risk decision

making (e.g. decision making of CEOs, BODs, etc.) or high risk decisions in other contexts other than investment (e.g. firm strategy, hiring, etc.)

Additionally, the significance of several subjective factors and angel characteristics in this study as moderators adds an interesting dynamic to our understanding of investing and the influence of such factors. The findings suggest that certain more subjective factors (personal relevance, entrepreneur enthusiasm, and having a social tie) and angel characteristics (risk aversion) influence investment. Together, these findings coincide with various quotes from angel investors. While "legitimate" and "profitable" investments were important and angels aspire to "hit a home run" investment, comments about more subjective factors such as "buzz" and "community" were prevalent throughout interviews.

These moderation findings also offer insight into theoretical boundary conditions. Specifically, at lower risk levels having a tie assists entrepreneurs in securing investment while at higher risk levels demonstrating enthusiasm assists them in securing investment. At lower return levels personal relevance assists entrepreneurs in securing financing while risk aversion hurts entrepreneurs seeking financing. However, the significance of these effects only holds up to a certain extent which suggests that the impact of these subjective factors and angel characteristics is limited.

Implications for Practice

The findings of this dissertation also offer many implications for practice to those on both sides (entrepreneurs and investors) of entrepreneurial financing. As very early stage investors may be swayed by expected returns and not perceived risk entrepreneurs could tailor their pitches to emphasize this. However, later in the investment timeline

risk may weigh more heavily on investors' decisions (e.g. VCs) (Tyebjee & Bruno, 1984). These findings also assist investors in understanding how they make decisions. In particular, investor decision making may be influenced when they know the entrepreneur, are swayed by enthusiasm, the project is personally relevant to them, or if their own level of risk aversion.

Factors such as personal relevance and risk aversion moderate the return-investment relationship, but only have an effect at certain levels of return. The presence of a social tie or enthusiasm moderate the risk-investment relationship, but again only to a certain extent. Therefore, while these factors may sometimes assist entrepreneurs in securing early financing they are not necessarily sufficient by themselves for entrepreneurs seeking funding.

Limitations

Several limitations of this dissertation must be acknowledged. First, the sample size is small and therefore analyses may be subject to small sample biases. However, compared to other studies attempting to do research in this area the sample size is quite large. The private nature of angel investors and the ventures in which they invest makes collecting data on them difficult with most studies failing to reach a sample in excess of 100 observations. Additionally, the small sample limits methods used and controls included which could offer significantly more insight into the phenomenon being examined.

Future Research

Despite the limitations associated with this research the robustness of the results offers assurance in moving forward. These findings offer interesting insights which can

be expanded upon in future research. First, risk and reward do not operate in angel investing as they do in VC investing. While related to one another, they are distinct constructs and influence and are influenced differently. Angel investors appear to focus on expected returns. This is very different from what traditional VC research would suggest and brings attention to the fact that all investors are not equal. Future research needs to address more of these differences and their theoretical implications.

Further exploration of other indirect relationships is also an area with much work to be done. Finally, the research in angel investment still lags far behind that of VC and has even been eclipsed by crowdfunding research. These indirect findings offer valuable insights into previously unrealized boundary conditions. Yet, there still remains much to be learned about this distinct, elusive, and economically significant investment group that is often the bridging financier assisting entrepreneurs in propelling their ventures to greater heights.

CONCLUSION

Angel investors are of great importance to ventures seeking capital and the study of them has implications for many fields including entrepreneurship, strategy, and finance. This dissertation examines how various factors influence angel investor perceptions and impact their eventual investment decision. While much of the extant literature on venture financing and investment decision making focuses on VC investment (e.g. Chen, Yao, & Kotha, 2009; Kirsch, Goldfarb, & Gera, 2009; etc.), I extend the literature on investment decision making by going to the stage before, and often necessary to, VC investment, that is, angel investors. I also extend our understanding of the roles of risk and return in early stage investment and find that expected return drives the investment decision. Finally, I

extend the uncertainty decision making literature by exploring the interactive effects of several subjective and often overlooked factors which influence decision making, finding that these factors have diminishing effects as risk and return increases.

CHAPTER 4:

SOCIAL TIES AND ANGEL INVESTMENT

ABSTRACT

Social ties are a valuable resource for entrepreneurs seeking assistance in growing their entrepreneurial ventures. However, all ties are not created equal. Using a sample of 203 investments by 106 angel investors, I examine the effects of social ties on entrepreneurial investment by angel investors. I find that the presence of a social tie between an entrepreneur and an angel investor is positively associated with the entrepreneur receiving investment. This relationship is moderated by the strength of that tie, but not the valence or reputation. However, additional analyses indicate that once other characteristics of the relationship such as length of relationship and reputation are taken into account, just having a social tie is no longer sufficient.

INTRODUCTION

Social networks and the individual social ties with which they are composed of can exert a significant amount of influence over the individuals with these ties within the network. Entrepreneurs are no different as their social connectivity can significantly impact themselves and their entrepreneurial endeavors. Social networks can be invaluable resources for entrepreneurs to draw upon to assist their firm (Smeltzer & Fann, 1989). Social networks play an important role in gaining access to information necessary to make decisions in competitive environments (Amatucci & Sohl, 2004; Li, 2005). These social ties can also act as signals, affirm legitimacy, as well as becoming channels from which resources can be accessed (Hoang & Antoncic, 2003). Social networks are

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therefore one key resource capable of affecting the success of entrepreneurial ventures (Brush, Carter, Greene, Hart, & Gatewood, 2002).

In the context of entrepreneurial venture financing, social connections to individuals or groups who can assist the ventures in securing the necessary funding can be vital. However, securing this capital is often a major challenge. After friends and family, entrepreneurs often seek out informal private investors, "angel investors" to assist them in funding their entrepreneurial venture (Burgelman & Hitt, 2007; De Clercq, Fried, Lehtonen, & Sapienza, 2006). These angel investors occupy a pivotal position in the timeline of venture financing, assisting entrepreneurial ventures to secure intermediate financing to continue growth until they are large enough to warrant venture capital investment. However, angel investors have more informal networks resulting in lower deal flow compared to more formalized venture capital (Van Osnabrugge, 2000). This makes finding and gaining access to angel investment a little more difficult if the entrepreneur does not have a social connection to grant them access to the elusive angel population.

Extant survey research indicates that a social tie(s) to entrepreneurial firms is one factor angel investors consider when evaluating the entrepreneurial venture investment opportunity. These social ties also impact the likelihood of the entrepreneurial venture receiving financing (Shane & Cable, 2002; Shane & Stuart, 2002). Trust, as developed between social ties, is one factor driving the assistance which social ties are willing to provide (Chua, Ingram, & Morris, 2008; Fiet, 1995). Social ties also allow information transfer amongst individuals decreasing information asymmetry between individuals (Amatucci & Sohl, 2004; Li, 2005), which is of great significance in an investment

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context, particularly angel investment (Shane & Cable, 2002; Shane & Stuart, 2002).

Despite the importance of this segment of investors to entrepreneurial activity, the private

nature of angel investors has limited the extent to which studies can assess the influence

of social connections on entrepreneurial financing. This has left an underexplored area in

the entrepreneurial financing literature which warrants further and more rigorous

examination.

THEORY AND HYPOTHESES

Social Networks

Both social networks and the social ties that compose the network have been

extensively studied areas across several fields. To date, studies have examined the

effects of social ties in a number of contexts on a number of outcomes such as

performance (e.g. Mehra, Dixon, Brass, & Robertson, 2006), resource access

(Granovetter, 1973; Oh, Labianca, & Chung, 2006), and trust (Chua, et al., 2008). In an

entrepreneurial context, it is well understood that social ties can be of significant

assistance to firms (e.g. Amatucci & Sohl, 2004; Hoang & Antoncic, 2003; Li, 2005;

Smeltzer & Fann, 1989). However, few studies have examined the role that social ties, or

to a greater extent, the entrepreneur's social network plays in securing financing to

further develop their entrepreneurial venture (e.g. Brush, et al., 2002; Shane & Cable,

2002; Shane & Stuart, 2002). While the findings of the extant studies suggest that the

social ties of the entrepreneur or venture management does indeed assist them in finding

sources of venture financing and increases their likelihood of securing the desired capital,

they fail to provide how subtle nuances in these social ties affect the investors perspective

of the venture and eventual investment decision. The following sections articulate a few

hypotheses which will shed more light on the connection between social ties and venture financing.

Social Ties

Social ties between investors and members of the venture seeking financing are a valuable resource and influence investor decision making (Nagy & Obenberger, 1994). Investors rely to a great extent on relationships to mitigate agency problems between themselves and firm management (Fiet, 1995). Angels who have ties to a venture possess greater familiarity with the entrepreneurs, increased trust of the entrepreneurs, and increased knowledge of the entrepreneur's capabilities which affect the likelihood of receiving investment (Shane & Cable, 2002; Shane & Stuart, 2002). Despite these preliminary findings, further examination of which, to what extent, and how social ties influence angel investor perception of the entrepreneurial investment opportunity and eventual decision to invest is warranted.

Hypothesis 1: The presence of a social tie between the entrepreneurial venture and angel investor will be positively related to investment.

Strength

Strong ties are often generated between individuals as they know each other longer, do more activities together, and develop closer relationships (Burt, 1984; Podolny & Baron, 1997). Individuals with strong ties between on another are often similar in values (Brass, Butterfield, & Skaggs, 1998). This is in line with social identity theory which states that individuals hold higher opinions and are more willing to assist individuals who they perceive to be similar to themselves (Tajfel & Turner, 1979). Investors are more receptive to investing in entrepreneurial ventures whose owners are

more similar to themselves (Galak, Small, & Stephen, 2011). Therefore, the stronger the

tie to the individual within the entrepreneurial firm, the more likely the investor will be to

invest in the venture.

> *Hypothesis 2: Strength of tie will positively moderate the positive relationship*
>
> *between the presence of a social tie and investment such that the stronger the tie*
>
> *from the angel investor's perspective the more likely they will invest.*

Valence

Positive social ties can assist in resource acquisition (Oh, et al., 2006). From an

angel investment perspective, angel investors with a positive tie or ties to an

entrepreneurial venture would be more like to assists it in finding resources, particularly

funding as that is at least one of the angel's areas of interest. Positive ties are also

indicative of greater trust between individuals (Chua, et al., 2008). Angel investors have

greater evaluations of entrepreneurial ventures whose entrepreneur/management they

trust (Bammens & Collewaert, forthcoming). Therefore, the angel investor's perception

of a positive tie or ties connecting an individual within the venture to an angel investor

has the ability to influence how they perceive the venture as well as their eventual

decision to fund the venture or not. The presence of a positive tie to the venture may

result in the angel investor being more inclined to take risk that they would otherwise

avoid as they have a pre-existing relationship with an individual in good standing with

them inside the organization. Additionally, by knowing an individual within the venture

the angel investor feels that the investment is a safer bet as they trust the individual to a

greater extent than someone whom they do not know or know, but do not view positively.

Hypothesis 3: How positive the tie is will positively moderate the relationship between the presence of a social tie and investment such that the more positive the tie from the angel investor's perspective the more likely they will invest.

Reputation

Reputation of the entrepreneur/management team has been found to influence venture funding (Shane & Cable, 2002). The reputation of an entrepreneur could vary significantly between investors regardless of whether they are acquainted. Therefore, reputation of an entrepreneurial tie could be significant in affecting venture financing. For example, entrepreneurs who have social ties and a higher reputation, from the angel investor's perspective, may be considered a more appealing investment opportunity and therefore at a higher likelihood of receiving funding versus a socially connected entrepreneur with a less than great reputation.

Hypothesis 4: The reputation of the tie will positively moderate the relationship between the presence of a social tie and investment such that the more reputable the tie from the angel investor's perspective the more likely they will invest.

Type

Different types of social ties offer different value and as such should be recognized (Burt, 1984; Marsden & Campbell; 1984; Wegener, 1991). There are underlying differences in relationships an individual has with family members, friends, co-workers, casual acquaintances, and others. These differences may manifest themselves in a venture financing context where certain groups of socially tied individuals may receive preference over others for various reasons. For example, perhaps business ties are more likely to receive funding as they are known to be more business

oriented. Perhaps family members are more likely to receive funding as the investor may

have certain familial obligations to support despite the potential of the entrepreneurial

investment opportunity.

Hypothesis 5: The type of tie will affect the likelihood of investment by the

investor.

A model of the proposed hypotheses is shown in Model 1.

MODEL 1

Model of Angel Investor Ties, Perception, and Investment
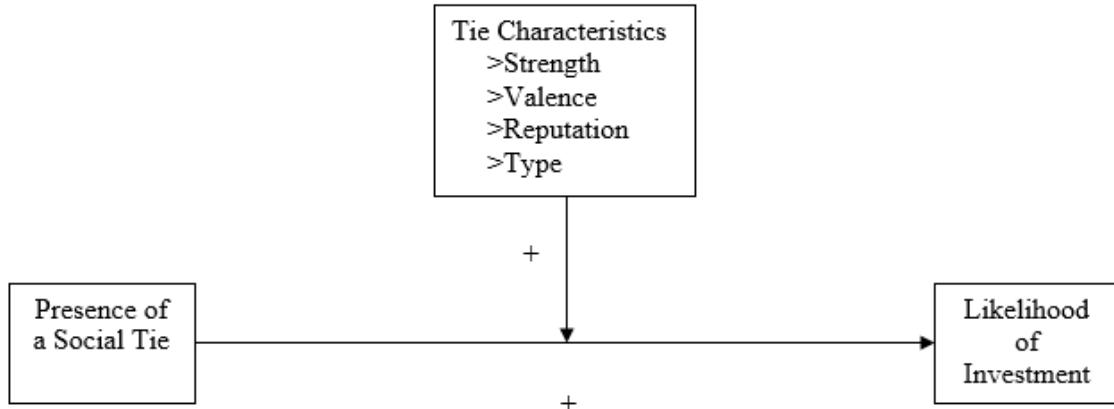
DATA AND METHODS

Data

I attended four angel investor meetings with three different angel groups in 2013

and 2014. Additionally, semi-structured interviews with ten angel investors were

conducted. From these initial experiences the research questions were fine-tuned and an

approach to data collection was decided upon. I developed a survey to collect data for

analyses of the hypothesized questions. I conducted a pre-test of the survey on one angel

group to ensure the validity of the survey items. Following the successful pre-test, I

administered the survey to angel investors throughout the United States. I contacted 257

angel groups and 72 entrepreneurial organizations with connections to angel investors via email during 2014 and 2015. 61 angel groups (23.74%) and nine entrepreneurial organizations (12.50%) acknowledged the request. 34 of these angel groups and five of the entrepreneurial organizations agreed to pass the survey along to angel investors.

Surveys were administered in two ways, in person and online, depending on the preference of the organization. The survey was viewed 187 times with 115 (61.50%) surveys being at least partially completed. This resulted in 115 angel investors and 220 investments. After observations with incomplete data were dropped the final sample used for analyses consisted of 106 investors with 203 investments. The survey asked angel investors to reflect on two investments which they remember well – one in which they invested and a second in which they did not. Additionally, angel investors were asked to answer questions about themselves. See the Appendix for the full survey.

Variables

Dependent Variable

Investment was measured as a 1/0 dummy where 1 indicated that the entrepreneur received investment from the angel investor and 0 indicated that the entrepreneur did not receive investment from the angel investor.

Independent Variables

Social Tie was measured as a 1/0 dummy where 1 indicated the presence of a social tie between the entrepreneur and the angel investor and 0 indicated the absence of such a tie. To constitute a social tie the investor had to previously know the entrepreneur and have some kind of relationship with them. Measurement of a social tie in this manner follows previous work (e.g. Burt, 1984).

Moderating Variables

Tie Strength was a construct composed of four items from Marsden and Campbell (1984). These four items: 1) How many times had you seen the entrepreneur in the year prior to the presentation. (Count of encounters) 2) How many years had you known the entrepreneur at the time of the presentation. (Count of years) 3) You had a close relationship with the entrepreneur. (1-5 Likert scale) 4) You had a relationship with the entrepreneur (1/0). The Cronbach alpha for the four items composing tie strength was 0.71. *Tie valence* was composed of three items on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). These items were derived from Wayne and Ferris (1990) and included: You believe you would get along well with the entrepreneur. 2) The entrepreneur seemed like a nice person. 3) You really liked the entrepreneur. The Cronbach alpha for this three item construct was 0.90. *Tie reputation* was composed of three items on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree") from Shane and Cable (2002). The items included: The entrepreneur gave the firm credibility. 2) The entrepreneur had a reputation for success. 3) You believe other individuals would vouch for the entrepreneur's ability to succeed. The Cronbach alpha for this construct was 0.84. Tie type was measured by asking what the relationship between the investor and entrepreneur was (e.g. family, friend, acquaintance, no relationship, etc.), a technique derived from previous work (Wegener, 1991). Each type was then dummied out with binary indicator variables with 1 representing the presence of that type of tie and 0 representing the absence of that particular type of tie.

Control Variables

Several control variables were used to rule out alternative explanations. At the investment level, *perceived risk* was measured using three items which were measured on five-point Likert scales measuring the responding angel investor's level of agreement with the survey item. Each item was measured on a five-point Likert scale ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items were derived from Hoffmann, Post, and Pennings (2013) and included: 1) Your perceived risk of investing in this venture was low. 2) You thought this venture was a risk averse investment. 3) You considered investing in this venture to be a safe investment. The Cronbach alpha for this three item measure was .83. Another, *expected return* was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The items for this construct were also derived from items used by Hoffmann et al. (2013) to measure expected return. The three items used were: 1) You had a positive feeling about the return expected from investment in this venture. 2) You thought it was likely that investing in this venture would lead to positive returns. 3) Your expected return for an investment in this venture was high. The Cronbach alpha for this three item measure was .93. *Entrepreneur enthusiasm* was controlled for. This construct was measured by the angel investor's perception of the entrepreneur's enthusiasm and consisted of three items adapted from Cardon, et al. (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The three items used were: 1) The entrepreneur was passionate about the venture. 2) The entrepreneur was enthusiastic about the venture. 3) The entrepreneur demonstrated high energy through body, facial, and vocal actions. The Cronbach alpha for this three item

measure was .87. Additionally, other *investor enthusiasm*, was controlled for. This construct was also measured by the angel investor's perceptions of other investors' reactions towards the investment opportunity and consisted of three items adapted from Cardon, et al. (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The three items used were: 1) Other investors at the presentation appeared to be passionate about the venture. 2) Other investors at the presentation appeared to be enthusiastic about the venture. 3) Other investors at the presentation demonstrated energy through body, facial, and vocal actions. The Cronbach alpha for this three item measure was .90. Finally, *personal relevance* was also controlled for and was measured by the angel investor feelings of personal relevance towards the project and consisted of four items adapted from Stephenson, Benoit, and Tschida (2009). This construct was also measured on five-point Likert scales ranging from one ("Strongly Disagree") to five ("Strongly Agree"). The four items used were: 1) This venture was important to you. 2) This venture was relevant to you. 3) This venture was one that really mattered to you. 4) This venture would have affected you personally. The Cronbach alpha for this four item measure was .88.

Additionally, several investor level characteristics are accounted for to control for alternative explanations. *Gender* was included to account for the sex of the investor. Gender was measured as a binary variable where 1 indicated a female investor and 0 indicated a male investor. *Age* was also accounted for by measuring the investor's age in years. Age has been found to impact investment decision making with some studies finding that risk seeking increases with age (Wang & Hanna, 1997) while others find that

it decreases (Morin & Suarez, 1983). *Single* accounted for the investor's familial status. This variable was measured as a binary indicator with 1 indicating an investor who is single and 0 indicating an investor who is not. Familial status has been found to influence risk as single individuals are more prone to act risky (Chaulk, Johnson, & Bulcroft, 2003). *Caucasian* controlled for ethnic background using a binary variable with investors classifying themselves as Caucasian receiving a 1 and anyone else receiving a 0. Upper level education controlled for investors who possessed an upper level collegiate degree. This was also a binary variable taking a 1 if the investor possessed a Masters or Doctorate degree and 0 if they did not. Not working controlled for investor's current working situation by using a binary indicator variable with 1 representing an investor who was currently not working and 0 representing an investor who was at least working part time. Additionally, the risk proclivity of the investor was assessed in two ways. First, by controlling for the *risk aversion* of the investor. This construct was measure using four Likert scale items ranging from one ("Strongly Disagree") to five ("Strongly Agree") which were derived from Hoffman, et al. (2013) and included: 1) You prefer certainty over uncertainty when investing. 2) You avoid risks when investing. 3) You do not like to take financial risks. 4) You prefer to "play it safe" when investing. The Cronbach alpha for this four item measure was 0.86. The second way was by assessing *portfolio risk* which measured the investor's perception of risk within their current financial portfolio. This construct was measure using three Likert scale items ranging from one ("Strongly Disagree") to five ("Strongly Agree") which were derived from Hoffman, et al. (2013) and included: 1) Your portfolio of investments is risk averse. 2)

You consider your investment portfolio to be safe. 3) Your investment portfolio has little risk. The Cronbach alpha for this three item measure was 0.86.

Method

Since investors were encouraged to answer questions pertaining to two investments, analyzing a full dataset would include many investors twice. Furthermore, the dependent variable is a 1/0 dummy. Therefore, a mixed effects logit modeling was used to analyze the full dataset with investments (level 1) nested within angel investors (level 2).

RESULTS

Table 1 presents the descriptive statistics and correlations for the variables used in the analyses. Investment was positively correlated with valence, reputation, perceived risk, expected return, enthusiasm (both entrepreneur and other investors), and personal relevance.

Table 1

Table 1: Descriptive Statistics and Correlations

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Investment Level																					
(1) Invest	0.60	0.49																			
(2) Social Tie	0.23	0.42	0.09																		
(3) Strength	0.02	0.82	0.10	0.64**																	
(4) Valence	3.80	0.77	0.27**	0.24**	0.31**																
(5) Reputation	3.81	0.76	0.40**	0.15*	0.12	0.47**															
(6) Type - Friend/Family	0.03	0.18	0.09	0.33**	0.50**	0.19**	0.10														
(7) Type - Other Acquaintances	0.15	0.36	0.06	0.79**	0.45**	0.20**	0.10	-0.08													
(8) Percieved Risk	2.21	0.80	0.16*	-0.02	-0.03	0.06	0.12	0.00	-0.06												
(9) Expected Return	3.43	1.07	0.60**	-0.01	-0.03	0.31**	0.34**	0.06	-0.05	0.32**											
(10) Entrepreneur Enthusiasm	4.38	0.64	0.15*	0.08	0.09	0.42**	0.39**	0.04	0.10	-0.07	0.22**										
(11) Investors Enthusiasm	3.47	0.74	0.41**	-0.12	-0.13	0.27**	0.35**	-0.11	-0.06	0.15*	0.50**	0.36**									
(12) Personal Relevance	2.83	0.83	0.26**	-0.07	0.04	0.25**	0.19**	0.01	-0.07	0.23**	0.28**	0.13	0.25**								
Investor Level																					
(13) Gender	0.06	0.23	-0.01	0.02	-0.03	-0.04	0.03	-0.04	0.01	-0.09	-0.05	0.08	-0.04	-0.10							
(14) Age	59.82	11.5	0.02	-0.12	-0.09	0.07	0.11	-0.05	-0.12	0.16*	0.12	0.12	0.11	0.16*	-0.19**						
(15) Single	0.08	0.27	-0.04	0.09	0.22**	0.03	-0.15*	-0.05	0.11	0.04	-0.07	0.06	-0.09	-0.03	0.23**	-0.16*					
(16) Caucausian	0.95	0.21	-0.02	-0.17*	-0.19**	-0.04	-0.02	0.04	-0.17*	-0.02	0.00	0.02	0.13	-0.04	0.04	0.18**	-0.12				
(17) Upper Level Education	0.61	0.49	-0.02	-0.01	0.08	0.02	0.05	0.08	0.00	0.02	-0.06	-0.08	0.01	0.09	0.03	0.14*	0.09	-0.02			
(18) Not Working	0.43	0.49	0.09	-0.16*	-0.17*	0.04	0.10	-0.09	-0.12	0.13*	0.09	0.04	0.10	-0.03	-0.13	0.46**	-0.08	-0.05	0.08		
(19) Risk Aversion	2.45	0.77	-0.10	-0.14*	-0.13	-0.05	-0.01	0.03	-0.20**	0.11	-0.02	0.05	0.02	0.05	-0.10	0.04	-0.03	-0.09	0.05	0.18**	
(20) Portfolio Risk	2.66	0.85	-0.02	-0.12	-0.04	-0.06	-0.12	-0.03	-0.08	0.03	-0.03	0.02	0.04	-0.01	-0.12	0.15*	-0.03	-0.03	0.10	0.21**	0.28**

Notes: N=203. ** and * indicate statistical significance at the 1% and 5% levels respectively. All tests are two-tailed.

Results from analyses are presented in Table 2.

Table 2

Table 2. Mixed Model Logit Results for Investment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Level								
Intercept	-6.80***	-8.17***	-11.37***	-12.36***	-11.19***	-11.38***	-12.22***	-11.43***
	(2.49)	(2.68)	(3.18)	(3.30)	(3.20)	(3.20)	(3.32)	(3.20)
Social Tie		1.08**	0.27	0.43	0.28	-3.61	-2.86	0.01
		(0.53)	(0.82)	(0.94)	(0.82)	(3.74)	(3.89)	(1.19)
Strength			0.34	-1.55	0.27	0.24	-1.50	0.32
			(0.42)	(1.02)	(0.44)	(0.45)	(1.02)	(0.48)
Social Tie x Strength				2.43*			2.26*	
				(1.24)			(1.27)	
Valence			0.02	-0.02	-0.10	0.09	-0.03	0.01
			(0.36)	(0.36)	(0.40)	(0.36)	(0.40)	(0.36)
Social Tie x Valence					0.47		0.32	
					(0.79)		(0.85)	
Reputation			1.27***	1.28***	1.31***	1.11***	1.17***	1.29***
			(0.36)	(0.36)	(0.36)	(0.39)	(0.39)	(0.36)
Social Tie x Reputation						1.03	0.85	
						(0.97)	(0.98)	
Type - Friend/Family								0.38
								(1.89)
Type - Other Acquaintances								0.37
								(1.19)
Percieved Risk	-0.18	-0.22	-0.25	-0.20	-0.25	-0.23	-0.18	-0.24
	(0.27)	(0.28)	(0.30)	(0.31)	(0.30)	(0.30)	(0.31)	(0.30)
Expected Return	1.41***	1.44***	1.48***	1.58***	1.49***	1.46***	1.55***	1.48***
	(0.24)	(0.25)	(0.28)	(0.29)	(0.28)	(0.28)	(0.30)	(0.28)
Entrepreneur Enthusiasm	-0.04	-0.17	-0.59	-0.65	-0.57	-0.58	-0.62	-0.59
	(0.34)	(0.35)	(0.41)	(0.42)	(0.41)	(0.41)	(0.42)	(0.41)
Investors Enthusiasm	0.78**	0.97***	1.04***	1.13***	1.03***	1.10***	1.18***	1.02**
	(0.34)	(0.36)	(0.40)	(0.41)	(0.40)	(0.41)	(0.43)	(0.40)
Personal Relevance	0.56**	0.67**	0.54*	0.62*	0.55*	0.50	0.59*	0.55*
	(0.28)	(0.29)	(0.31)	(0.33)	(0.31)	(0.32)	(0.33)	(0.32)
Investor Level								
Gender	0.03	0.06	-0.09	0.03	-0.12	-0.15	-0.06	-0.05
	(0.84)	(0.84)	(0.94)	(0.96)	(0.95)	(0.93)	(0.97)	(0.95)
Age	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Single	-0.02	-0.17	0.47	0.30	0.51	0.75	0.60	0.49
	(0.75)	(0.75)	(0.80)	(0.81)	(0.80)	(0.86)	(0.89)	(0.82)
Caucausian	0.40	0.82	0.90	0.95	0.85	0.95	0.96	0.91
	(1.08)	(1.19)	(1.27)	(1.26)	(1.29)	(1.30)	(1.30)	(1.27)
Upper Level Education	0.10	0.14	0.02	-0.10	0.01	0.08	-0.03	0.01
	(0.40)	(0.41)	(0.43)	(0.44)	(0.43)	(0.43)	(0.44)	(0.43)
Not Working	0.50	0.61	0.44	0.41	0.42	0.36	0.35	0.44
	(0.50)	(0.51)	(0.56)	(0.57)	(0.57)	(0.57)	(0.58)	(0.57)
Risk Aversion	-0.47*	-0.43	-0.44	-0.52	-0.44	-0.46	-0.54*	-0.43
	(0.28)	(0.28)	(0.31)	(0.32)	(0.31)	(0.31)	(0.33)	(0.32)
Portfolio Risk	0.24	0.24	0.47	0.50	0.46	0.53*	0.54*	0.47
	(0.26)	(0.26)	(0.29)	(0.30)	(0.29)	(0.30)	(0.31)	(0.30)
N	203	203	203	203	203	203	203	203
Log Likelihood	-87.41	-85.23	-77.00	-74.90	-76.82	-76.39	-74.44	-76.95
Wald Chi-Square	51.10	49.71	48.54	48.39	48.38	48.29	47.79	48.73
Prob(chi-square)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses. ***,**, *, indicate statistical significance at the 1%, 5%, and 10% levels respectively. All tests are two-tailed. ICC for null model = 0.00.

Model 1 presents a baseline model. Hypothesis 1 predicted that having a social tie would be positively related to the entrepreneur securing investment. Hypothesis 1 is supported in Model 2 as having a social tie between an entrepreneur and angel investor is

significantly related to the entrepreneur receiving funding (B = 1.08, p<0.05), although

the significance disappears once reputation is controlled for in subsequent models.

Hypothesis 2 predicted that the strength of the relationship would positively moderate

(strengthen) the positive relationship between having a tie and investment. Hypothesis 2

is marginally supported in Model 4 and 7 (B = 2.43, p<0.10) as having a strong

relationship between the entrepreneur and angel investor was significantly related to the

entrepreneur receiving investment. This finding suggests that having a strong tie may

assist entrepreneurs in securing funding to a greater extent than just having a tie. This

interaction is plotted in Figure 1.

Figure 1
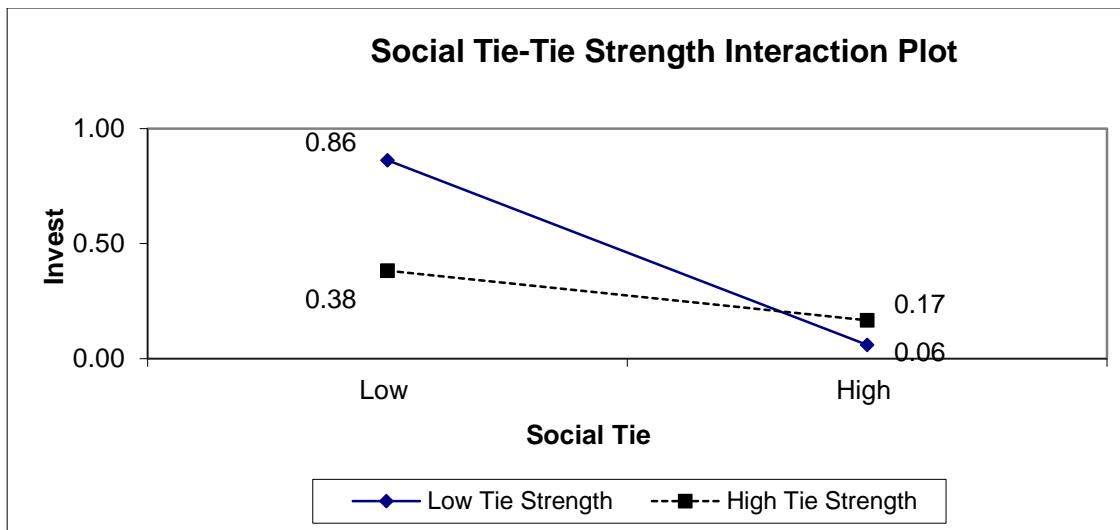
Hypothesis 3 predicted that having high valence would positively moderate the

positive relationship between having a social tie and investment. This hypothesis was not

supported. Hypothesis 4 predicted that having a high reputation would positively

moderate the positive relationship between having a social tie and investment. While

having a high reputation was significantly directly related to investment the moderation

hypothesis was not significant. Hypothesis 5 predicted that the type of tie would

positively moderate the positive relationship between having a tie and investment.

Specifically, closer types (e.g. family) would be stronger than further types (e.g.

acquaintances). Two tie types were examined, but neither moderation hypothesis was

supported.

Additional Results

The lack of results is somewhat surprising as there is a long literature on the

effects of tie nuances (e.g. Burt, 1984; Chua, et al., 2008; Marsden & Campbell, 1984;

Podolny & Baron, 1997; Wegener, 1991). Therefore, several additional tests were

conducted to examine some factors which may trump having a social tie. First, as

indicated in Table 2, having a social tie was significant until reputation was incorporated

into the model. In subsequent tests, this result was strongly upheld. Reputation seems to

be far more important in securing investment that merely knowing someone.

Additionally, subsequent testing revealed that having a lengthier relationship

assisted in securing financing. Testing indicated that having a long-term relationship was

significantly positively related to securing financing. *Long relationship* was measured as

a 1/0 dummy where 1 indicated the presence of a social where the entrepreneur and the

angel investor had known each other for five years or longer and 0 indicated the absence

of such a long lasting relationship. This result not only negated the effects of just having

a social tie, but also stayed significant when reputation was incorporated into the model.

In conclusion, the presence of a social tie between an entrepreneur and an angel investor

is positively associated with the entrepreneur receiving investment. However, once other

characteristics of the relationship such as length of relationship and reputation are taken

into account, just having a social tie is no longer sufficient. Instead entrepreneurs who have longer relationships with angel investors or have higher perceived reputations from angel investors are better positioned to secure angel investment.

DISCUSSION

Theoretical Contributions

While numbers indicate that angel investors invest in approximately fifteen times the number of entrepreneurial ventures that VCs do, research has lagged in understanding the uniqueness of angel investors. Both theoretically and empirically angel investors operate differently from VCs. As such, assumptions based on VC research must be tested and verified. These findings have implications not only for entrepreneurial financing, but also for other decision making contexts and beyond.

There are many theoretically important implications in the realms of entrepreneurial financing and social network theory which both researchers and practitioners can use. As expected social ties were significantly related to securing investment. This relationship was also positively moderated by the strength of the relationship allowing entrepreneurs with strong ties to angel investors to have a key advantage in securing necessary capital. However, once additional relational factors were incorporated the effects of just having a social connection were no longer an adequate advantage and did not significantly affect the investment decision. Specifically, reputation and longevity of relationship were more significant drivers of the investment decision, trumping just having a tie.

These findings further social network research by assessing some of the nuances of relationships. In doing so boundary conditions are identified where having a social tie

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no longer offers the significant advantage as often suggested in network literature. These finding just scratch the surface of the intersection of entrepreneurial financing and social networking theory. As many other interactions and relationships are yet to be discovered pertaining to how ties affect investment.

Implications for Practice

Social ties may have an impact on investment, but that impact may be limited or even mitigated by other factors which investors deem more important when choosing investments. The findings of this dissertations offer many implications for practice to those on both sides (entrepreneurs and investors) of entrepreneurial financing. Entrepreneurs may not want to rely too heavily on their ties to investors. Instead other more credible signals of quality derived from their relationship to the investor may be better positioned to assist them in securing investment.

Limitations

Several limitations must be acknowledged. First, the sample size is small and therefore analyses may be subject to small sample biases. However, compared to other studies attempting to do research in this area the sample size is quite large. The private nature of angel investors and the ventures in which they invest makes collecting data on them difficult with most studies failing to reach a sample in excess of 100 observations. Additionally, the small sample limits methods used and controls included which could offer significantly more insight into the phenomenon being examined.

Future Research

Despite the limitations associated with this research the robustness of the results offers assurance in moving forward based off the findings. As these findings were robust

to multiple specifications these findings offer interesting revelations which can be expanded upon in future research in financing and social networks. An area with much future research potential is identifying other tie nuances which affect investment and discerning whether such effects negate just having a social tie. This is an area with much potential as research on angel investment still lags far behind that of VC and has even been eclipsed by crowdfunding research. Yet, there still remains much to be learned about this distinct, elusive, and economically significant investment group that is often the bridging financier assisting entrepreneurs in propelling their ventures to greater heights.

CONCLUSION

There is still much to be learned about angel investing, specifically how social ties affect the investment decision. This is surprising as this area of research is of great strategic importance to entrepreneurial ventures seeking capital to grow. It is also an interesting realm for sociological study on networks and tie characteristics. Since angel investors are known for assessing investment opportunities using more subjective criteria (Aernoudt, 1999; Baty and Sommer, 2002; Morrissette, 2007) such as social ties, studying the intersection of angel investing and social ties is a particularly enticing area for future researchers to explore. While the effects of tie nuances played a limited role in this study, much potential remains for identifying other relationship characteristics which to play a role in investment decision making.

CHAPTER 5:

CONCLUSIONS

DISCUSSION

This dissertation examines the factors which influence angel investor perceptions which impact their eventual investment decision. In Chapter 2, a model is proposed which has perceived risk and expected return at its core. Additionally, this model goes above and beyond existing models by incorporated objective economic factors, subjective non-economic factors, and angel characteristics into it. In doing so, conjectures are offered about not only what effects the investment decision, but more importantly how these factors affect the investment decision. Visually, this model can be translated into a malleable hurdle rate which entrepreneurs must exceed to receive financing and influential factors can affect in two ways. This influence can manifest itself by moving the investment relative to the hurdle rate and/or moving the hurdle rate relative to the investment.

In Chapter 3, the model proposed in Chapter 2 is tested using a sample of angel investor surveys collected during 2014 and 2015. First, antecedents to perceived risk and expected return are tested. The direct effect of leadership quality and business quality had no effect on perceived risk, but leadership did on expected return (business quality could not be tested). Experience (as an investor, in industry, and as an entrepreneur), an angel characteristic, had no moderating effect on these relationships. The effects of perceived risk and expected return on investment were then tested. Expected return was very significant and perceived risk was not suggesting that, contrary to other types of investors (e.g. VCs), angel investors rely only on return expectations and seem not to

consider risk. Several angel characteristics and subjective non-economic factors were tested to see if they moderated these relationships. Entrepreneur enthusiasm and having a social tie moderated the risk-investment relationship while personal relevance and risk aversion moderated the return-investment relationship. These findings offer valuable insights about the distinctions between risk and return, theoretical boundary conditions based on the empirical findings, and a better understanding of angel investment decision making.

Finally, Chapter 4 examined the nuances of social ties. Using a survey data from 203 investment opportunities analyzed by 106 angel investors, empirical tests suggest that social ties have a positive effect on receiving investment, but only to a certain extent. Once additional tests were conducted, the strength of tie moderated this relationship suggesting that entrepreneurs with strong relationships with the investor benefited by securing investment to a greater extent than entrepreneurs with weaker ties. Additionally, reputation of the entrepreneur seems to trump having a tie. Therefore, being a highly reputed entrepreneur and/or having a very strong relationship assisted entrepreneurs in securing funding to a greater extent than just possessing a tie to the investor. These findings contribute to social networking theory and offer some interesting insights into the intersection of investment decision making and tie nuances.

Theoretical Contributions

Perceived risk and expected return are two pivotal perceptions on which investment decision making is based. However, it is important, both theoretically and empirically, to understand that while related to one another each is a unique construct capable of exerting influence and having influence exerted upon it. This is theoretically

relevant to understanding the boundary conditions relating to decision making in uncertainty. Contrary to other investment research, I find that angel investors view risk as either obsolete or too difficult to assess or estimate and so it is disregarded and expected return in relied upon to make investment decisions. This is theoretically significant and important not only to an entrepreneurial context, but also has ramifications to other areas of high-risk decision making.

Additionally, not only is it important to recognize *which* factors exert influence, but also *how* these factors exert their influence. This is theoretically important and can assist researchers in finding and understanding theoretical boundary conditions imposed by the extent of their influence. The model presented allows for influence to be exerted in both ways (direct and indirect) creating a malleable hurdle rate representative of how angel investors make decisions. Empirically, I find support for this model as certain more subjective factors (personal relevance, entrepreneur enthusiasm, and having a social tie) and angel characteristics (risk aversion) influence investment through moderating relationships. These moderation findings offer insights into theoretical boundary conditions in a variety of theoretical settings (e.g. social networking theory).

Implications for Practice

The findings of this dissertation also offer many implications for practice for entrepreneurs and investors. Early stage investors may be swayed by expected returns and not perceived risk entrepreneurs could tailor their pitches to emphasize this. Additionally, investors may be influenced by if they know the entrepreneur, their enthusiasm, if the project is personally relevant to them, or their level of risk aversion. Specifically, social ties need to be strong or the entrepreneur needs to be highly reputable

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to significantly affect the investment decision. These findings also assist investors in understanding how they make decisions, but also it is important for entrepreneurs interested securing financing to tailor their pitches to the audience at hand.

Limitations

While the model presented offers a unique and useful viewpoint from which to examining angel investment decision making, it incorporates multiple theoretical lenses increasing its complexity. This makes testing the full model all at once difficult without using more advanced statistical techniques (e.g. structural equation modeling) along with a larger sample. The small sample size attained in this dissertation limited the empirical analyses and the robustness of such results, yet this sample is much larger than most research on angel investors. This is due to the private nature of angel investors and the ventures in which they invest making collecting data on them difficult unless significant time and money are invested (the sample used in this study took a year and a half to collect, several trips, and hundreds of emails). Finally, angel research and this study may suffer from sample biases as only a small segment of investors who choose to participate are represented.

Future Research

Despite the limitations and difficulties of this type of research, the findings of this study should motivate others to conduct similar studies. Not only is the literature in angel investing still significantly lagging behind that of the literature on VCs, but this study offers a glimpse at the differences between these investors and the ramifications that such findings may have on the broader area of decision making in great uncertainty. Risk and reward do not operate in angel investing as they do in VC investing. While related to one

another, they are distinct constructs and influence and are influenced differently and should be thought of as such going forward. Future research needs to examine this distinction further and its theoretical implications.

Additionally, further exploration of other indirect relationships is also an area with much work to be done. Indirect findings, such as those presented in this dissertation, offer valuable insights into previously unrealized boundary conditions. Theoretically, it is important to understand what and in which circumstances a finding holds and when it fails to hold. This is particularly relevant and interesting in the area of decision making in uncertainty such as angel investment. Due to the difficulties of conducting research in this area, much still remains to be learned about angel investors, the private yet pivotal investors of early stage ventures.

CONCLUSION

In conclusion, there is still much to be learned about angel investing, specifically angel investment decision making. Much of the extant literature on venture financing and investment decision making focuses on VC investment (e.g. Chen, Yao, & Kotha, 2009; Fried & Hisrich, 1994; Kirsch, Goldfarb, & Gera, 2009; MacMillan & Narasimha, 1987; MacMillan, Siegel, & Narasimha, 1985; MacMillan, Zemann, & Narasimha, 1987). I extend the literature on investment decision making by going to the stage before, and often necessary to, VC investor involvement, that is, angel investors. This is surprising as this area of research is of great importance to ventures seeking capital to grow and provides many excellent research opportunities, impacting entrepreneurship, strategy, and finance. While the venture investment decision making explored in this dissertation was specifically from an angel investor context, however many of the

concepts translate to other investment decision making scenarios as well as decision making in general. Certain major factors often play a significant role in decision making, however there are many very interesting influences affecting, both directly and indirectly, the relationships leading to the final decisions made. Going forward, many practical as well as theoretical implications remain to be revealed in entrepreneurial financing and decision making in extreme uncertainty.

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TRULASKE COLLEGE OF BUSINESS
UNIVERSITY OF MISSOURI

ANGEL INVESTOR SURVEY

<u>Investment Opportunity 1:</u>

Please answer the following questions about a <u>venture presentation</u>. Please select a venture you have funded or, if you have not funded any ventures, select a venture whose presentation you remember well.

1. What was the venture's name and/or general idea?

To help us understand what, if any, prior relationship you had with the entrepreneur(s), please answer the following questions.

1. Had you met the entrepreneur prior to the presentation? Please circle one.   1. No   2. Yes

2. How many times had you seen the entrepreneur in the year prior to the presentation?
   _____ times

3. How many years had you known the entrepreneur at the time of the presentation?
   _____ years _____ months

4. What was your relationship with the entrepreneur at the time of the presentation? Please circle one.

| 1. No Relationship | 2. Knew by Reputation Only | 3. Acquaintance | 4. Friend | 5. Family Member | 6. Other _____ |

Please circle the number indicating the extent to which you agree with the following statements.

Your perception of the venture.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. This venture had a reasonable exit strategy	1	2	3	4	5
2. This venture's market had large potential for growth	1	2	3	4	5
3. This venture's revenue potential was large	1	2	3	4	5
4. This venture's product/service development risk was low	1	2	3	4	5
5. There were reasonable barriers to entry for this venture's industry	1	2	3	4	5
6. This venture's business model was strong	1	2	3	4	5
7. This venture would support opportunities for local individuals	1	2	3	4	5
8. This venture offered a product/service which was socially beneficial	1	2	3	4	5
9. This venture would enhance the community	1	2	3	4	5
10. This venture was important to you	1	2	3	4	5
11. This venture was relevant to you	1	2	3	4	5
12. This venture was one that really mattered to you	1	2	3	4	5
13. This venture would have affected you personally	1	2	3	4	5

Your perception of the entrepreneur.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. You had a close relationship with the entrepreneur	1	2	3	4	5
2. The entrepreneur appeared coachable	1	2	3	4	5
3. The domain expertise of the entrepreneur was strong.....	1	2	3	4	5
4. The entrepreneur appeared trustworthy............................	1	2	3	4	5
5. The entrepreneur had a proven track record....................	1	2	3	4	5
6. The entrepreneur appeared honest....................................	1	2	3	4	5
7. You believed you would get along well with the entrepreneur	1	2	3	4	5
8. The entrepreneur seemed like a nice person...................	1	2	3	4	5
9. You really liked the entrepreneur	1	2	3	4	5
10. The entrepreneur gave the firm credibility....................	1	2	3	4	5
11. The entrepreneur had a reputation for success	1	2	3	4	5
12. You believe other individuals would vouch for the entrepreneur's ability to succeed	1	2	3	4	5
13. The entrepreneur was passionate about the venture	1	2	3	4	5
14. The entrepreneur was enthusiastic about the venture	1	2	3	4	5
15. The entrepreneur demonstrated high energy through body, facial, and vocal actions..	1	2	3	4	5

Your perception of other investors.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Other investors at the presentation appeared to be enthusiastic about the venture	1	2	3	4	5
2. Other investors at the presentation demonstrated energy through body, facial, and vocal actions.....................	1	2	3	4	5
3. Other investors at the presentation appeared to be passionate about the venture	1	2	3	4	5
4. After some time, other investors' opinions became more positive about investment in this venture...............................	1	2	3	4	5

Your perception of the overall investment opportunity.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Your level of interest in investing in this venture at the time of the presentation was high...	1	2	3	4	5
2. Your perceived risk of investing in this venture was low	1	2	3	4	5
3. You thought this venture was a risk averse investment ..	1	2	3	4	5
4. You considered investing in this venture to be a safe investment..	1	2	3	4	5
5. You had a positive feeling about the returns expected from investment in this venture	1	2	3	4	5
6. You thought it was likely that investing in this venture would lead to positive returns...	1	2	3	4	5
7. Your expected return for an investment in this venture was high..	1	2	3	4	5

1. Did you invest in this venture? Please circle one.   1. No   2. Yes

2. How much did you invest in this venture? $ _____

3. What was the outcome of this investment? Please circle one.
    1. Did not Invest   2. Loss   3. Pending   4. Gain

<u>Investment Opportunity 2:</u>

Please answer the following questions about a second <u>venture presentation</u>. Please select a second venture, which you <u>did not fund</u>, whose presentation you remember well.

1. What was the venture's name and/or general idea?

To help us understand what, if any, prior relationship you had with the entrepreneur(s), please answer the following questions.

1. Had you met the entrepreneur prior to the presentation? Please circle one.   1. No   2. Yes

2. How many times had you seen the entrepreneur in the year prior to the presentation?
    _____ times

3. How many years had you known the entrepreneur at the time of the presentation?
    _____ years _____ months

4. What was your relationship with the entrepreneur at the time of the presentation? Please circle one.

1. No Relationship	2. Knew by Reputation Only	3. Acquaintance	4. Friend	5. Family Member	6. Other _____

Please circle the number indicating the extent to which you agree with the following statements.

Your perception of the venture.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. This venture had a reasonable exit strategy	1	2	3	4	5
2. This venture's market had large potential for growth	1	2	3	4	5
3. This venture's revenue potential was large	1	2	3	4	5
4. This venture's product/service development risk was low	1	2	3	4	5
5. There were reasonable barriers to entry for this venture's industry	1	2	3	4	5
6. This venture's business model was strong	1	2	3	4	5
7. This venture would support opportunities for local individuals	1	2	3	4	5
8. This venture offered a product/service which was socially beneficial	1	2	3	4	5
9. This venture would enhance the community...................	1	2	3	4	5
10. This venture was important to you	1	2	3	4	5
11. This venture was relevant to you....................................	1	2	3	4	5
12. This venture was one that really mattered to you..........	1	2	3	4	5
13. This venture would have affected you personally	1	2	3	4	5

Your perception of the entrepreneur.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. You had a close relationship with the entrepreneur	1	2	3	4	5
2. The entrepreneur appeared coachable	1	2	3	4	5
3. The domain expertise of the entrepreneur was strong.....	1	2	3	4	5
4. The entrepreneur appeared trustworthy...........................	1	2	3	4	5
5. The entrepreneur had a proven track record...................	1	2	3	4	5
6. The entrepreneur appeared honest.................................	1	2	3	4	5
7. You believed you would get along well with the entrepreneur................	1	2	3	4	5
8. The entrepreneur seemed like a nice person...................	1	2	3	4	5
9. You really liked the entrepreneur	1	2	3	4	5
10. The entrepreneur gave the firm credibility....................	1	2	3	4	5
11. The entrepreneur had a reputation for success	1	2	3	4	5
12. You believe other individuals would vouch for the entrepreneur's ability to succeed................	1	2	3	4	5
13. The entrepreneur was passionate about the venture	1	2	3	4	5
14. The entrepreneur was enthusiastic about the venture	1	2	3	4	5
15. The entrepreneur demonstrated high energy through body, facial, and vocal actions................	1	2	3	4	5

Your perception of other investors.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Other investors at the presentation appeared to be enthusiastic about the venture................	1	2	3	4	5
2. Other investors at the presentation demonstrated energy through body, facial, and vocal actions	1	2	3	4	5
3. Other investors at the presentation appeared to be passionate about the venture................	1	2	3	4	5
4. After some time, other investors' opinions about this investment in this venture became more positive................	1	2	3	4	5

Your perception of the overall investment opportunity.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Your level of interest in investing in this venture at the time of the presentation was high................	1	2	3	4	5
2. Your perceived risk of investing in this venture was low	1	2	3	4	5
3. You thought this venture was a risk averse investment ..	1	2	3	4	5
4. You considered investing in this venture to be a safe investment................	1	2	3	4	5
5. You had a positive feeling about the returns expected from investment in this venture................	1	2	3	4	5
6. You thought it was likely that investing in this venture would lead to positive returns................	1	2	3	4	5
7. Your expected return for an investment in this venture was high................	1	2	3	4	5

1. Did you invest in this venture? Please circle one.   1. No   2. Yes

2. How much did you invest in this venture? $ _____

3. What was the outcome of this investment? Please circle one.
    1. Did not Invest   2. Loss   3. Pending   4. Gain

<u>You and Your Background:</u>

People with different backgrounds view investing differently. Please answer the following questions to help us understand your background.

1. Gender: Please circle one.   1. Female   2. Male

2. Age: _____ years

3. Current marital status: Please circle one.   1. Married/cohabiting   2. Single

4. Number of dependents you are currently responsible for financially? _____ individuals

5. Ethnic background: Please circle one.

| 1. African American | 2. Native American | 3. Asian/Pacific Islander | 4. Caucasian | 5. Latino /Hispanic | 6. Other _____ |

6. What is your highest educational level? Please circle one.

| 1. Some High School | 2. High School | 3. Some College | 4. Bachelor | 5. Master | 6. Doctorate |

7. Growing up, in which socio-economic category would you place your family? Please circle one.

   a. <u>Upper class</u> – The social elite. Income mostly from earned or inherited assets.
   b. <u>Upper middle</u> – Upper managers, professionals, medium size business owners; college educated; family income nearly twice the national average.
   c. <u>Middle class</u> – Middle level white-collar, top level blue-collar; education past high school; income somewhat above national average.
   d. <u>Working class</u> – Middle level blue-collar, lower level white-collar; income slightly below the national average.
   e. <u>Working poor</u> – Below mainstream America in living standard, but above the poverty line; low paid service workers, operatives; some high school education.
   f. <u>Underclass</u> – Depending primarily on welfare system for sustenance; living standard below poverty line; not regularly employed; low level of schooling.

8. What is your main industry of expertise? _____

9. How many years of experience do you have in your industry of expertise? _____ years

10. What is your current employment status? Please circle one.

| 1. Full-Time Employment | 2. Part-Time Employment | 3. Unemployed | 4. Full-Time Homemaker | 5. Retired | 6. Other _____ |

11. How many ventures have you started? _____ ventures

12. How many years have you been investing in ventures as an angel investor? _____ years

13. How many ventures have you provided funding for as an angel investor? _____ ventures

Please circle the number indicating the extent to which you agree with the following statements.

Your perception of your investing.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. You prefer certainty over uncertainty when investing	1	2	3	4	5
2. You avoid risks when investing	1	2	3	4	5
3. You do not like to take financial risks............................	1	2	3	4	5
4. You prefer to "play it safe" when investing	1	2	3	4	5

Investment decisions often depend on the investor's financial situation, therefore we ask about your current investment portfolio.

1. **Investment Risk:** Please indicate your perceptions of your investment risk.

Please circle the number indicating the extent to which you agree with the following statements.

Your perception of your overall investment portfolio.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Your portfolio of investments is risk averse....................	1	2	3	4	5
2. You consider your investment portfolio to be safe	1	2	3	4	5
3. Your investment portfolio has little risk...........................	1	2	3	4	5
4. You are satisfied with your present financial situation ...	1	2	3	4	5
5. You are content with your current standard of living......	1	2	3	4	5

2. **What is your perception of your current financial situation? Please circle one.**

1. Not at all adequate	2. Can meet necessities only	3. Can afford some things you want	4. Can afford about everything you want	5. Can afford everything you want and still save

3. **Investment Portfolio:** Please indicate approximate percentages (totaling 100%).

a. Bonds/Debt: _____ %

c. Public Company Stock: _____ %

d. Private Company Stock: _____ %

e. Real Estate (not including primary residence): _____ %

f. Cash/Cash Equivalents: _____ %

g. Other _____: _____ %

h. Total: __100__ %

Thank you.

Your participation is greatly appreciated!

VITA

John P. Berns earned a BA from The University of Iowa in 2006. After working for several years he received a MBA from Iowa State University in 2011. In 2016 he completed a PhD in Business Administration from the Robert J. Trulaske, Sr. College of Business, University of Missouri - Columbia. His primary research interests include venture financing, entrepreneurship, and firm governance. He is a member of the Academy of Management and Strategic Management Society. His research has been presented at several international conferences. He has taught the undergraduate capstone strategy course and the undergraduate introductory entrepreneurship course. He has received awards for both his research and teaching.