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VENTURE CAPITAL INVESTMENT:

MOTIVATIONS OF THEIR SUPPLIERS AND USERS IN THE NETHERLANDS

Abstract

This research set out to find the motivations and abilities that affected the decision of venture capitalists and early stage new technology based firms to provide and accept early stage venture capital. A behavioral perspective was used to build a conceptual framework of intrinsic motivations, extrinsic motivations and abilities that could induce or prevent the provision or acceptance of venture capital at a micro-level.

A sample of venture capitalists and a sample of new technology based firms were then surveyed digitally on their motivations with both perception indicators and a set of behavioral indicators related to their decision to engage in venture capital funding.

The results indicate that late stage Venture Capitalists experience four barriers preventing expansion into early stage investments, namely low return/risk rates of early stage deals, lack of sector experience, the potential reputational harm of early stage investments and the different time investments required for an early stage portfolio. Early stage oriented Venture Capitalists experience no lack of capital or business proposals, but are likely limited by human capital constraints. On the receiving end, New Technology Based Firms do not identify the added value of the VCs and are drawn to its' substitutes instead. Lack of local involvement of the VC, distrust of the references of intermediaries and unsatisfactory negotiation results further decrease the acceptance rate of venture capital. Policy makers must address the current informational market failure and beware of a potential supply side human capital shortages on the early stage VC market.

Quantitative investigation at micro level into the behavior of market level actors is still accompanied with significant conceptual and practical challenges. However, several widely accepted effects could not be confirmed at the micro level and some findings even appeared to contradict current beliefs. These novel findings indicate that further micro-level research of market actors can increase the understanding of the dynamics of the venture capital market by providing valuable new insights.

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1. Introduction

The European Union has long sought to establish a vibrant high-technology industry (European commission, 2002 and 2004). Recent figures indicate, however, that previous policy goals have not been reached and that the high-technology industry is still in its infancy in Europe. Average R&D intensity was 2.01% in 2009, which is only a small increase compared to the 1.83% in 2002 (Eurostat, 2011). New companies are unlikely to become champions of R&D: 22% of the biggest R&D spenders in the United States are young companies (less than 35 years old) whereas in Europe this is only 2% (Veugelers, 2009). Apparently, Europe fails to create enough growing high tech firms.

These growing high tech firms, which are often called New Technology Based Firms (NTBFs), report a lack of external financing as their most often encountered problem (Colombo et al., 2007; Veugelers, 2009). This is not a surprise as banks and other institutional investors are reluctant to invest in companies without a track record or collateral. NTBFs face this problem even more often, as regular investors are often incapable of correctly assessing the value of their resources (Giudici and Paleari, 2000). This capital provision problem is alleviated by Venture Capitalists (VCs), who are specialized financiers that use three control mechanisms (screening, contracting and monitoring) to overcome agency problems and avoid excessive risk (Hall and Hofer, 1993; Kaplan and Stromberg, 2001).

However, the venture capital market the EU is severely underdeveloped, especially when it comes to the financing of NTBFs. In 2010, € 42.6 billion was invested by all EU venture capitalists in just under 5000 companies (EVCA, 2011). In 2010, the amount of venture capital invested in the US was around $ 180 billion (NVCA, 2011). In the US, seed and early stage capital account for 32% of all venture capital investments. In the EU, early stage and seed capital only form 4.5% of total VC funds invested. Empirical research supports the avoidance by VCs of high technology investments in the EU, whereas US VCs invest a large part of their capital in high-technology portfolio firms (Lockett et al., 2002; Allen and Song, 2002; EVCA, 2010a; EVCA, 2011).

Scholars have argued that the differences between EU and US venture capital market dynamics are strongly influenced by differences in their institutional environments (Bruton et al., 2006). The size of technology stock markets like the NASDAQ is an example of the US' institutional environment affecting the dynamics of its venture capital market whereas in the EU a pan-European high technology stock market has yet to be established (EVCA, 2005). Large and liquid technology stock markets make it more attractive for VCs to invest in early stage technology firms, because they can exit portfolio firms with attractive profits via initial public offerings (IPOs) (Jeng and Wells, 2000).

Previous studies have indeed attempted to relate the size of venture capital markets to institutional settings, but only at the national level (e.g. Black and Gilson, 1998; Botazzi and Da Rin, 2002; Schertler, 2003; Armour, 2004; Armour and Cumming, 2006; Cumming, 2011). These macro-level approaches help to understand the relationship between institutional environments and the performance of venture capital markets. But this relationship is indirect and reflects only an empirical regularity and not a causal relationship, because the observed market dynamic is the outcome of the aggregated behaviors of micro-level actors.

It is this study's contention that perceptions of the institutional environment influence the behaviors of actors at the micro-level. The macro-level studies are used here to derive hypothetical effects which the institutional environment might have on motives and other characteristics of micro-level

venture capital market participants that subsequently influence their actual behavior. Understanding how institutional contexts influence venture capital decision outcomes at the micro level will enhance our knowledge of the functioning of venture capital market.

Previous attempts to investigate individual venture capital market actors have thus far been fairly scattered and not focused on the effects of the institutional environment. Examples of previous micro-level investigative efforts into behavior of the venture capital providers include, amongst others, attempts to map venture capitalists' decision criteria and processes (MacMillan et al., 1987; Hall and Hofer, 1993), to review the syndication of investments (Manigart et al., 2006), or to examine the role of previous entrepreneurial failure in investment decisions (Cope et al., 2004). All these studies investigate the rationales of venture capitalists' behavior, but they neglect, however, the conditioning effects of the institutional context on that behavior.

Since the early 60s researchers have been concerned with the capital structure of firms and have developed the pecking order theory to explain it (Myers, 1984). Later scholars have expanded this capital preference model to fit NTBFs (the potential venture capital recipients) as well (e.g. Berggren et al, 2000; Paul et al., 2007), but again, did not relate this preference to prevailing institutional conditions. Consequently, they provided only partial explanations of international differences in preferences for venture capital use, which suffer from potential spurious correlation (Babbie, 2007). Institutional conditions may influence the outcomes of venture capital market actors decision making resulting in, for example, slow venture capital markets in the EU.

Only one study at the micro-level studied both the demand and supply side of venture capital funding. This is the study of Wright, Lockett, Clarysse and Brinks (2006). However, their scope was limited to university spinouts and excluded a wide and important range of NTBFs' which are also eligible for early stage venture capital. Their research included the motivations of venture capital providers and recipients to engage in venture capital funding, but again institutional conditions and their effects on venture capital decision making outcomes remain unclear.

Only systematic and rigorous analysis of venture capital market actors' behaviors will provide insight into micro-level drivers and hindrances of engaging in venture capital funding. To this end this study will employ a behavioral perspective at the micro-level of venture capital actors. In this perspective "*(…) behavioral achievement depends jointly on motivations and ability (…)*"(Ajzen, 1991, p. 182). The decision outcome to engage in venture capital funding is conceived of as the behavioral achievement to be studied; i.e. the focus is the decision outcome, not the decision making process. The motivations are derived from both the *attitudes towards the behavior* (intrinsic motivations) and the *subjective norms* in place (extrinsic motivations). The ability to perform the studied behavior of venture capital provision or acceptance is related to *the degree of perceived behavioral control*. (Ajzen, 1991). These three concepts will be further discussed in the theory section.

This paper tries to answer the following research question:

> *What motivations and abilities affect the decision of venture capitalists and early stage new technology based firms to provide and accept early stage investment capital?*

In studies of the fledgling EU venture capital market, scholars have previously pointed at problems with the limited supply of venture capital (Jeng and Wells, 2000; Barnes and Menzies, 2005;

Schneider and Veugelers 2008), while others claim that the limited demand for venture capital is the primary cause (Gompers and Lerner, 2001; Lockett et al., 2002; Da Rin et al., 2006). These scholars investigated the decision making outcomes of the actors involved but without taking the constraints of prevailing institutional conditions as a part of their motivations and abilities into account.

This study aims to empirically investigate the intrinsic and extrinsic motivations and abilities of both suppliers and potential recipients to engage in venture capital funding. The main question is divided into two sub-questions that relate to either the supply or the demand side of venture capital funding.

If VCs are motivated and able to invest in early stage NTBFs, this will result in a higher share of early stage investments in the portfolio of the VC. The first sub-question therefore is:

Sub-question 1: *What motivations and abilities affect the decision of venture capitalists to invest early stage venture capital into early stage new technology based firms?*

This research defines the NTBFs in accordance with the definition of the Arthur D. Little Group, which states that these companies should be independently owned businesses based on the exploitation of a new technology with substantial risk (Little, 1977), which is indicated in this study by a firm that is active in a high tech sector. Also, NTBFs mentioned in this research are early stage NTBFs (no older than 7 years), because these are considered to still be eligible for early stage venture capital funding.

If NTBFs are motivated and able to attract venture capital as a source of capital, this will result a higher share of venture capital in the capital structure of NTBFs. The second sub-question is:

Sub-question 2: *What motivations and abilities affect the decision of early stage new technology based firms to accept early stage venture capital funding?*

The motivations do not comprise only intrinsic motivations such as return/risk considerations, but also extrinsic motivations such as the effects of the institutional environments on the alignment of VCs and NTBFs. Examples are the extent to which VCs and NTBFs perceive the observed geographical mismatch between high tech industry and VC clusters as problematic (Martin et al., 2002; Martin et al., 2003; Heger et al., 2005), or whether differences in legislation between nations (EVCA, 2005; European Commission, 2009) are perceived to make cross-border investment within the EU difficult.

Seed- and start-up capital are the types of venture capital meant to assist new firms in their primacy years before they can more easily acquire other forms of capital (EVCA, 2002) and are most crucial to overcome the capital constraints of NTBFs (Botazzi and Da Rin., 2002; Mason, 2008). This paper will therefore focus on seed and early stage venture capital, together called early stage venture capital.

This empirical research is limited to the venture capital market in the Netherlands. The venture capital market of The Netherlands is quite developed in terms of size and is the third largest per capita in the EU after Sweden and Finland (Cumming, 2011). However, the majority of venture capital funds in The Netherlands is invested in late stage buy-outs. This lack of early stage funding is also a distinctive characteristic of the larger continental European venture capital markets in Germany and France and is therefore a central feature of the EU VC markets (EVCA, 2011). Furthermore, The sources of Dutch venture capital funds are quite similar to those of other European venture capital funds in general (EVCA, 2011). Accordingly, the Dutch venture capital market may be conceived as a good illustration of the continental European venture capital markets. All potential causes for the weak performance of the EU venture capital markets also apply to the Dutch venture capital market.

2. Theoretical Framework

2.1 The venture capital decision outcome

The weakness of the continental European venture capital market observed at the macro level is the result of the behaviors of the micro-level actors involved. This is because the sum of the decision outcomes of all market actors together determines the market outcome. This research will employ a behavioral perspective to investigate in more details the causes of the decisions of venture capitalists to provide early stage venture capital and of new technology based firms to accept it.

In order to explain human (decision making) behavior, Ajzen (1991) developed his theory of planned behavior, which is an extension of the theory of reasoned action (Fishbein & Ajzen, 1975). A central feature of the theory of planned behavior is the proposition that individuals need to have the intention to engage in a certain behavior in order to perform that behavior. When this intention gets larger it becomes more likely that the behavior is performed[1]. The intention to perform some behavior is influenced by 3 interrelated concepts: 1) the attitude towards that behavior, 2) subjective norms and 3) perceived behavioral control. The theory of planned behavior was developed to predict variations in actor behavior from variations in these three concepts. (Ajzen, 1991)

The first concept defined by Ajzen is the "*degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question.*" (Ajzen, 1991, p. 188). In other words, the disposition of an actor towards some behavior. The behavior under scrutiny here is the provision or acceptance of venture capital. The appraisal of this behavior can be conceived of as the outcome of weighing the *pros and cons* of this behavior by an actor. For a VC it comprises the intrinsic motives to invest or not to invest in early stage portfolio firms. For NTBFs it concerns the intrinsic motives to accept or not to accept venture capital.

The second concept comprises subjective norms, which are described as "*the perceived social pressures to perform or not to perform the behavior*" (Ajzen, 1991, p.188). This study considers laws and other regulations to be a part of these subjective norms, because they can substitute social pressures (by penalizing their violation. Posner, 1997).

The third concept is perceived behavioral control. Even if the behavior is desirable, actors can perceive that the result is not entirely in their hands due to "*anticipated impediments and obstacles*" (Ajzen, 1991, p. 188). Social pressures can also be conceived of as obstacles, but social pressures come from an actor's social environment and do not lie within the abilities of an actor, whereas the obstacles of perceived behavioral control do. Perceived behavioral control reflects the extent to which an actor believes that performing the behavior will have the desired result. It includes *confidence* factors ("*How well am I capable of executing the required course of action?*") and *availability* factors preventing an actor from achieving certain behaviors, such as limited funds for a venture capitalist (Armitage and Connor, 2001).

The three concepts proposed by Ajzen (1991) that influence the performance of actors on the micro-level will be further elaborated below. Accordingly, the intrinsic motives (attitudes towards the

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[1] Scholars found that the theory of planned behavior better predicts intended behavior than performed behavior (Armitage and Connor, 2001; Ajzen, 2011). Even though intended behavior can be predicted with greater accuracy, the performed behavior of actors is what determines the market outcome. Performed behavior is therefore taken as dependent variable of this research.

behavior), extrinsic motives (subjective norms) and abilities (perceived behavioral control) of VCs and NTBFs will be specified in greater details and hypotheses concerning their effects on the shares of venture capital funding provided and accepted will be formulated.

2.2 Venture capitalists

In this section, hypotheses are derived from various dimensions of Ajzens' three concepts to explain the (non)provision of venture capital funding by venture capitalists. The funding mentioned here relates to early stage investments in portfolio firms.

2.2.1 Intrinsic motives

In its most existential form, the venture capitalist is a profit-maximizing actor who seeks to maximize the return on invested capital. The venture capitalist simultaneously scouts for sources of funds and business proposals to invest in. Venture capitalists take more risk than regular investors. The compensation for this higher risk lies in a higher-than-average return on investment. The lower the return/risk ratio, the fewer incentives a venture capitalist has to invest. The required return depends on prevailing market conditions: in a situation where there is a surplus of good deals the required return per deal will go up and in a situation where there is an abundance of available capital, venture capitalists will accept a lower return. These effects of balancing supply and demand are addressed later. The assumed relationship between return/risk ratio and investment is positive and will be tested with the following hypothesis:

H-S$_1$:   *High return/risk ratios increase a VC's portfolio share of early stage investments. (+)*

The negative consequences of bad investments reach beyond the financial damages due to the bankruptcy of the portfolio firm. Venture capitalists also want to avoid reputational damages due to backing unsuccessful firms, because previous performance determines their reputation (Nahata, 2008). Barnes and Menzies (2005) found that the reputation of venture capitalists strongly determines their funding by institutional investors. According to Nahata (2008), this reputation also affects outcomes, since investment offers of reputable venture capitalists are more likely to be accepted. Van Osnabrugge and Robinson (2000) report that VCs indeed avoid early stage investment because of the higher risk of failure and the consequences of negative reputational effects. Additionally, the long term nature of early stage investments also causes reputational harm via the *opportunity cost of reputation*, because lengthy early stage investments prevent quickly establishing a good reputation via positive returns. Reputational harm is thus expected to have a negative impact on a VC's early stage investment, which will be tested with the following hypothesis:

H-S$_2$:   R*eputational hazard reduces a VC's portfolio share of early stage investments. (-)*

2.2.2 Extrinsic motives

Social pressures originating from an actor's environment influence its decision outcome in various ways. These effects can be institutional and/or social in nature (i.e. the behavior of other market actors).

The first effect social pressures might have on VCs is that institutional investors, who are the primary source of capital for VCs, do not provide enough capital to VCs. This might result from risk-aversion of the institutional investors, but another frequently mentioned cause is the so called "*Prudent Man*" rule, which prevents pension funds to invest in venture capital funds. Relaxation of the prudent man

rule in the US in 1979 enabled pension funds to invest in venture capital funds (Black and Gilson, 1998; Kortum and Lerner, 2000; Botazzi and Da Rin, 2002). The EU equivalent of the "*Prudent Man*" rule relaxation was not enacted until 2003 with a transposition directive for 2005 (EVCA, 2004). This delay in enabling policies in the EU may have had structural effects on the portfolios of institutional investors and the limits of capital available to venture capitalists. In the Netherlands, the percentage of venture capital originating from pension funds is only 4.2% (whereas in the US, it is more than 50%. EVCA, 2011; Botazzi and Da Rin, 2002) The research will test the following negative relation:

H-S$_3$: *A lack of capital provided by institutional investors decreases a VC's portfolio share of early stage investments. (-)*

Venture capital funding occurs in a competitive environment where venture capital funds compete with one another for high quality business deals within their area of expertise. Policy efforts to stimulate venture capital investments have recently also led to the creation of public alternatives to venture capital. Studies that investigated the effects of public venture capital funding indicate that such public funds might substitute private funds (Armour and Cumming, 2006; Cumming and MacIntosh, 2006). Public funds can offer better financial deals because they are less resource constrained, but also offer non-financial benefits such as less involvement in the recipient firm. Some also perceive the lack of experience of public servants as a constraint on their value adding ability (Leleux and Surlemont, 2003). The empirical debate has not settled yet. Leleux and Surlemont (2003) suggest that public funds only provide legitimization for a new technology based industry and do not appear to influence the private venture capital market. But Armour and Cumming (2006) and Cumming and MacIntosh (2006) provide empirical support for the VC's perception of public venture capital as an environmental constraint. Accordingly this study tests the following hypothesis:

H-S$_4$: *Public venture capital funds decrease a private VC's portfolio share of early stage investments. (-)*

Sharing the market with other venture capital firms does not only lead to competition amongst VCs but also to cooperation with other VCs. This allows VCs to acquire complementary knowledge, reputation or skills, to increase the capital available and allows to diversify risk (Brander et al.,2002; Schwienbacher, 2005; Hopp and Rieder, 2011). Since both specialization and risk are higher in early stage development, one would expect higher levels of syndication in early stage venture capital markets (Norton and Tenenbaum, 1993). Within the venture capital market, this phenomenon is called syndication. Empirical evidence suggests that syndicated VCs are more successful (Hege et al., 2003; Hege et al., 2009), but EU VCs syndicate less than VCs in the US. These observed differences between the EU and the US are said to be attributable to the institutional context (Manigart et al., 2006). Possible explanations are that US VCs are more specialized and that a higher density of VCs in the US increases the odds of finding complementary assets, but a definite explanation has not been given yet. This research will test the hypothesized positive relationship between syndication opportunities and the VCs portfolio share of early stage investments with the following hypothesis:

H-S$_5$: *Syndication opportunities with other VCs increase a VC's portfolio share of early stage investments (+)*

Hypotheses H-S$_4$ and H-S$_5$ deal with other suppliers of venture capital, but VCs can also perceive attributes of the demand side of the market as an environmental constraint. Rosiello et al. (2010) argue that the venture capital industry is simultaneously dependent on the availability of capital from investors and on vibrant new business ideas. Schefczyk and Gerpott (2000) similarly argue that the

surplus of venture capital in 2000 was either due to the low number of proposals or the low quality of those proposals. Perceived low quality or low numbers of options to choose from reduces the profit expectations of venture capitalists and thus their motivation to invest. This means that an increased quantity and quality of early stage business opportunities would increase the portfolio share of early stage investments, and these relationships are tested with the following hypotheses:

H-S$_6$:   *The quantity of applications for venture capital funding increases a VC's portfolio share of early stage investments.(+)*

H-S$_7$:   *The quality of business proposals increases a VC's portfolio share of early stage investments.(+)*

A last group of environmental effects constraints neither other suppliers nor the demand side of the market, but the alignment of these market participants.

Venture capitalists reduce risk by providing high-level support to their portfolio firms and sometimes even take up entire company functions such as corporate finance. *"This (…) reliance on personal visits (…) to monitor and supervise investee companies suggests that venture capital firms will tend to have a limited geographical range"* (Martin et al., 2003, p.11). A large distance to portfolio firms is likely to make involvement harder because it increases the efforts to be made by the VC to keep control over a venture and thus makes investment more costly, more risky and less attractive to the VC.

Whilst there are several financial and high-tech clusters in the EU, and some coincide, there are still various mismatches of venture capital clusters and high-tech industry clusters (Martin et al., 2002; Martin et al., 2003; Heger et al., 2005). These mismatches would result in larger geographical distances between VCs and NTBFs.

The Netherlands is a small country, and geographical distances are generally small in comparison with other countries. Large distances therefore often correlate with portfolio firms located in other countries. The effects of distance and nation should however be separated in two hypotheses: hypothesis H-S$_8$ will only test distance regardless of home country, and hypothesis H-S$_9$ will only test for different nations, regardless of distance. This is necessary because an international portfolio firm can be close (just across the border) and on the other hand a portfolio firm can be at quite a distance but still in the same country (when the portfolio firm is located on the far end of the country). The relationship tested with the following hypothesis is therefore the negative effect distance is expected to have on a VC's portfolio share of early stage venture capital.

H-S$_8$:   *Geographical distance to NTBFs decreases a VC's portfolio share of early stage investments (regardless of the NTBF's home country). (-)*

The legislative context is important for introducing alignment issues faced by VCs. National legislations of EU Countries differ greatly (EVCA, 2005; European Commission, 2009) regarding, for example, the protection of creditors and debtors and the legal entities of firms. These juridical differences increase the uncertainties associated with cross-border investments.

The cross-border difficulties are particularly harmful for VCs that are located in smaller EU countries and that are thus confronted with barriers to grow internationally. Unification efforts have been shown to have a positive effect on cross-border investments (Alhorr et al. 2008). However, the institutional differences are still significant and continue to hamper cross-national (pan-European)

venture capital investments (EVCA, 2010b; Meuleman and Wright, 2011). Thus, differences in EU national legislations harm the motivation of VCs to invest abroad, thereby limiting their investment opportunities. This research tests the assumed negative relationship between legislation and portfolio shares of early stage investment with the following hypothesis:

H-S$_9$: *Differences in national legislations decrease a VC's portfolio share of early stage investments (regardless of the distance to the portfolio firm). (-)*

Interactions of VCs and NTBFs are often established by intermediaries (Ferrary and Granovetter, 2009; Mason, 2007). Additionally, Bruton et al. (2006) report that some more conservative venture capitalists even require a reference of an intermediary for a deal to reach the screening phase and Hall and Hofer (1993) find that VCs spend extra attention on deals from known sources. Intermediaries can thus provide a link between market actors, but can also go one step further and recommend an NTBF to a VC. A lack of involvement of intermediaries in the venture capital market could therefore hamper the alignment of market participants. This paper wants to investigate if such a lack of involvement of intermediaries is perceived by VCs as an environmental constraint in finding interesting NTBFs. The hypothesized positive effect of intermediation is tested with the following hypothesis:

H-S$_{10}$: *Intermediation increases a VC's portfolio share of early stage investments. (+)*

2.2.3 Ability

When the venture capitalist has the desire to invest in early stage ventures, the perception of its ability to do so can still deter investment. A venture capitalist would claim: '*I can see why this investment will be profitable, but I do not think I am capable of it*'.

A lack of self-confidence of executing a certain behavior might be caused by a perceived lack of experience of the actor. Schertler (2003) identifies two different types of experience relevant to VCs: experience in sectors with related technologies and experience with investing in companies in a particular development stage. This leads to the following two hypotheses where the positive effects of both types of experience are tested:

H-S$_{11}$: *Sufficient technological experience of VCs with portfolio firms' technologies increases a VC's portfolio share of early stage investments. (+)*

H-S$_{12}$: *Sufficient investment experience of VCs with portfolio firms' early of stage development increases a VC's portfolio share of early stage investments. (+)*

Apart from a lack of confidence to invest, venture capitalists might also be physically barred from investing in business proposals. This might occur because the venture capitalist does not have enough funds available (tested with H-S$_3$) or that the deals are just too small to fit in a venture capitalist's portfolio (Wright et al., 2006). The last hypothesis therefore tested amongst VCs is the following:

H-S$_{13}$: *A match of actual deal size with prospected deal size increases a VC's portfolio share of early stage investments. (+)*

2.3 New technology based firms

The following section will elaborate on new technology based firms engaging in venture capital funding by accepting venture capital financing.

2.3.1 Intrinsic motives

Whilst the motivation of VCs to invest more in later stages of firm development relative to the early stage is fairly blunt a return-risk matter, an NTBF has to face other effects of venture capital funding compared to other means of financing.

The acceptance of venture capital by an NTBF requires a critical circumstance: the firm needs substantial amounts of capital. The pecking order theory (Myers, 1984) suggests that external equity (to which venture capital belongs) is the least desirable alternative to an entrepreneur because internal financing and debt (including friends, family and fools) are safer means with less control to be given up (Giudici and Paleari, 2000). The same theory states that the NTBF will only accept venture capital when there is a need for capital *and* a lack of substitutes. Accordingly, the next hypothesis tests the negative effect of substitutes on venture capital as capital source for NTBFs:

H-D$_1$: S*ufficient availability of substitutes for VC funding reduces an NTBF's equity share of venture capital. (-)*

It is broadly accepted that most entrepreneurs want to keep control over their own venture (Hogan and Hutson, 2005). Becker and Hellman (2003) report that German entrepreneurs regard releasing control of their venture as exploitation. At the same time, venture capitalists often include special contractual clauses in investment agreements that allow them to gain some control over the venture (Kaplan and Stromberg, 2001). The inability to keep control over their venture reduces the incentive for NTBFs to accept venture capital.

The inability to keep control is further compounded by the low likelihood of the entrepreneur to regain control later on. An Initial Public Offering (IPO) often enables the entrepreneur to regain control over the venture because he is able to buy back shares. However, IPOs are less likely to occur in the EU because of its illiquid stock markets due to the European stock market fragmentation and the bank-based financial system (c.f. Jeng and Wells, 2000). The research tests the positive relationship between control and venture capital as a source of capital with the following hypothesis:

H-D$_2$: *The ability to retain or regain control increases an NTBF's equity share of venture capital. (+)*

In contrast to the previous two hypotheses, NTBFs might also be compelled to accept venture capital. This is because venture capital backed firms perform better than companies without venture capital (e.g. Engel, 2002). The success of venture capital backed firms is not entirely due to the selection process of VCs (i.e. only firms that will become successful by themselves), but VCs also add value to their portfolio companies with their advice, reputation and connections (Davila et al., 2003). The perception of the value-adding potential of a VC increases the motivation of the entrepreneur to accept venture capital. The positive relationship between perceived value added and the equity share of venture capital is tested with the following hypothesis:

H-D$_3$: *The perceived value added by a VC increases an NTBF's equity share of venture capital. (+)*

2.3.2 Extrinsic motives

The entrepreneur faces a wide array of subjective norms that can hamper the NTBFs' decision to accept venture capital. First, the consequences of business failure can include both personal bankruptcy and social stigmatization. This is related to engaging in venture capital because the acceptance of venture capital also means accepting high-growth targets set by VCs. High growth targets introduce extra risk and consequently business failure may appear to become more likely.

Social stigmatization is more an issue in Europe than in the US. In the United States previous entrepreneurial failure is often seen as an opportunity for learning whereas in Europe it is seen as a sign of incompetence (Landier, 2001; Becker and Hellman, 2003), even by venture capitalists (Cope et al., 2004). Or, as the Economist put it in 1998: "*If you start a company in London or Paris and go bust, you have just ruined your future; do it in Silicon Valley and you have simply completed your entrepreneurial training.*" The negative social consequences range from a lowered status in society to difficulties with finding employment (Landier, 2001). In sum, the anticipated negative social consequences of a failed enterprise result in a social pressure that constrains the pursuit of a risky business proposal. Accordingly, this research tests the negative relationship between anticipated social stigmas and the equity share of venture capital with the following hypothesis:

H-D$_4$:   *Fear of social stigmatization after failure decreases an NTBF's equity share of venture capital. (-)*

Apart from societal judgment, the legal consequences of bankruptcy can be severe for the personal financial future of the entrepreneur (Landier, 2001; Armour and Cumming, 2006). In Europe, where bankruptcy law is more stringent than in the US (Armour, 2004), NTBFs may anticipate these negative consequences more and are therefore likely to choose financiers who stress more conservative business strategies than high growth trajectories. In this sense, the legal environment constrains the NTBFs' acceptance of venture capital. The negative relationship of anticipated legal effects on the equity share of venture capital for an NTBF is tested with the following hypothesis:

H-D$_5$:   *The legal effects of bankruptcy decrease an NTBF's equity share of venture capital. (-)*

Another social pressure on a new technology based firm is the distance between the VC and the NTBF. A VC from another part of the country is expected to have less knowledge about local markets and local partners. It is also harder to build a trust relation across a larger distance (Sapienza, 1992). Thus, it is conceivable that NTBFs would prefer local investors. The hypothesized negative effect of the lack of local involvement on the equity share of venture capital will be tested with the following hypothesis:

H-D$_6$:   *Lack of local involvement of VCs decreases an NTBF's equity share of venture capital.* (-)

The role played by intermediaries in connecting VCs and NTBFs is equally relevant for both the supply (venture capitalists) and the demand (the new technology based firms). The research therefore tests the same positive relationship of intermediation for NTBFs with the following hypothesis (c.f. H-S$_{10}$):

H-D$_7$:   *Intermediation increases an NTBF's equity share of venture capital. (+)*

2.3.3 Ability

NTBFs may consider venture capital to be a desirable source of funding but be unconfident of their ability to attract it, or, alternatively, they could be physically barred from accepting it. The most obvious physical restriction is the unavailability of venture capital. Wright et al. (2006) imply that venture capital is scarce, especially in the earliest stages of development of an NTBF. This study will test the positive relationship between availability of venture capital and the equity share of this capital:

H-D$_8$:   *The availability of venture capital increases an NTBF's equity share of venture capital. (+)*

Entrepreneurial self-efficacy (the confidence in ones' own entrepreneurial abilities) has been shown to be a good predictor of future entrepreneurial behavior (Chen et al., 1998). Confidence appears to be an important ingredient for an entrepreneurial career. However, scientific research has not yet shown a relation to exist between a lack of self-confidence and the financing behavior for NTBFs, and therefore this research does not directly test this relationship.

Literature does suggest that VCs and NTBFs might value deals differently, resulting in problematic interactions. *Storey and Tether* (1998) find that entrepreneurs repeatedly overestimate their new business potential compared to outside observers (such as investors). Overconfidence could render the NTBFs less able to negotiate a deal that is attractive to someone who values their business in a less optimistic way.

A discrepancy in deal valuation could also result from miscommunication or weak presentation, as *Giudici and Paleari* (2000) state: "*often the entrepreneurs speak with difficulty to existing and potential stakeholders, risking to present the firm as a non-appealing business*" (Giudici and Paleari, 2000, p. 40). These interactions might over time influence the entrepreneur's self-confidence in his ability to attract venture capital funding. This research will test the assumed positive relationship between the match in deal valuation of NTBFs and VCs and the equity share of venture capital:

H-D$_9$:   *A match in deal valuation between the VC and the NTBF increases an NTBF's equity share of venture capital. (+)*

In a study on the funding of new technology based firms, Van Auken (2001) investigated the relationship of familiarity effects and the NTBFs' ability to properly negotiate the terms of the funding alternative, finding that insufficient familiarity with a financing alternative can lead to both suboptimal negotiation and decision outcomes. Additionally, Van Auken finds that NTBFs indeed are most familiar with traditional sources of finding, and not so familiar with capital destined for growth purposes, such as early stage venture capital. Thus, insufficient experience with venture capital funding could lead an NTBF to negotiate a bad deal or unjustly reject a good venture capital deal. In VC markets that are smaller like the Continental EU VC market, it is likely harder to develop the familiarity with early stage venture capital necessary to make well-informed decisions.

This research therefore tests a hypothesized relationship between the experience (as a measure of familiarity) with the venture capital market and an NTBFs equity share of early stage venture capital.

H-D$_{10}$:   *More experience with early stage capital as a funding alternative increases an NTBF's equity share of venture capital. (+)*

2.4 Conceptual model

Figure 1 depicts the conceptual model. The dependent variable is different for VCs and NTBFs, but these two dependent variables together determine the market outcome. If the early stage venture capital market is effective, the equity shares of venture capital of NTBFs and the early stage portfolio shares of VCs will be relatively large. The signs of the hypotheses indicate the direction of hypothetical effects of abilities and motives on venture capital provision by VCs and venture capital acceptance by NTBFs.

New Technology Based Firm

Intrinsic motivation
- availability of substitutes (-)
- retaining and regaining control (+)
- added value by venture capitalist (+)

Extrinsic motivation
- stigmatization after failure (-)
- legal effects of bankruptcy (-)
- lack of VCs local involvement (-)
- intermediation (+)

Ability
- Availability of venture capital (+)
- Matching deal valuation (+)
- Knowledge of VC funding (+)

Equity share of venture capital in capital mix

Portfolio share of early stage investments

Intrinsic motivation
- return-risk ratio (+)
- reputational hazard (-)

Extrinsic motivation
- Shortage of capital (-)
- public venture capital funds (-)
- syndication opportunities (+)
- quality of business proposals (+)
- quantity of business proposals (+)
- geographical distance (-)
- differences in national legislation (-)
- intermediation (+)

Ability
- sector experience (+)
- stage experience (+)
- match of fund size with deal size (+)
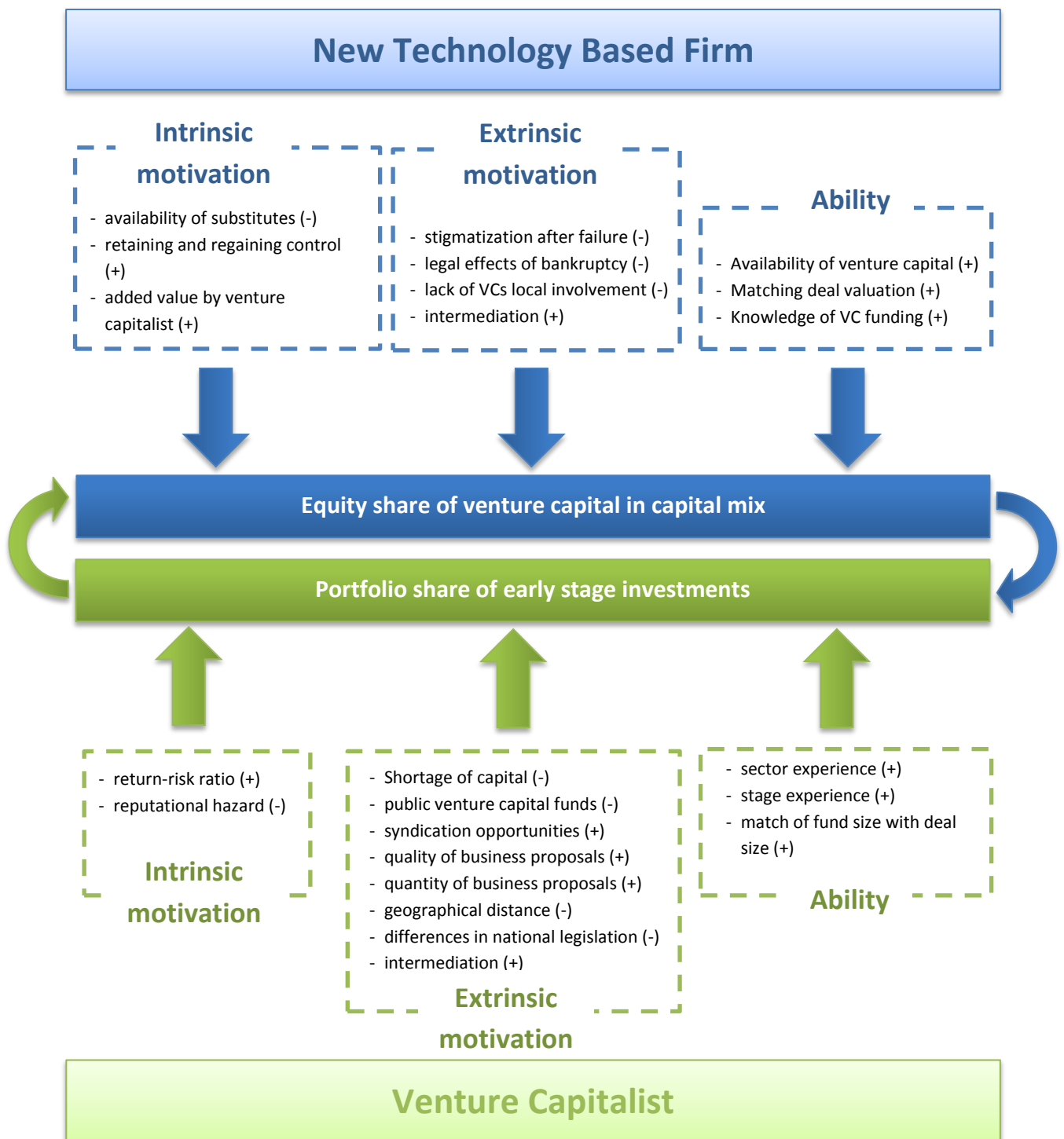
Venture Capitalist

Figure 1: Conceptual Model

2.5 Control variables

2.5.1 Control variables Venture Capitalists

Several general descriptive characteristics of the respondents are included as control variables for the investigated relationships. For the Venture Capitalists, the questionnaire will control for the following variables:

VC size

Two of the hypothesized effects relate to the interaction of a VC with their environment, namely the syndication and the intermediation hypotheses (H-S_5 and H-S_{10}). Larger VCs can be expected to require less assistance from their environment: they can diversify risk away within their own larger portfolio, and are less dependent on intermediaries for new deals because they can perform the deal scouting function within their firm.

It is however, not easy to construct a valid proxy for venture capitalist size due to the different natures of the late stage and early stage VC markets. The late stage VC funds are bigger because the average deal size is bigger and, therefore, the VCs require more capital in their investment funds. For syndication, an indicator on the total number of deals per firm will be constructed. The larger the number of deals, the smaller the need for syndication as risk diversification tool (H-S_5). Then, this research combines multiple indicators to an 'employee per deal' ratio, which codifies how much manpower the firm actually has per investment deal. The lower the ratio, the larger the overhead and the smaller the dependence on intermediation is expected to be.

VC age

Older and more seasoned venture capitalists have a longer track record and can be assumed to have more experience within their particular fields of investment. This control variable will therefore be included in the hypothesis test of experience, since the data might reflect an age effect rather than the hypothesized specialization effect in a sector or development stage. (H-S_{11} and H-S_{12})

VCs' Legal entity

Different legal entities are governed by different rules and regulations, in particular under Dutch tax law. Foundations, for instance, are not allowed to exist for the purpose of generating a profit for their owners, and are subject to very harsh tax regimes to prevent that practice from being attractive. This variable is included as a control variable to the hypothesized effect of return/risk ratio on the dependent variable, because a different legal entity might indicate a different profit-mindedness of the actor and thus influence the hypothesized effect. (H-S_1)

VCs' Geographical location

The geography of the Netherlands features several industrial and commercial clusters that can be conceived of as potential geographical concentrations of potential portfolio firms for the VCs. Venture Capitalists that are situated closer to these industrial clusters, are expected to have shorter travels to most of their portfolio firms, and as a result could be less concerned about travel time. Their geographical location is thus included as a control variable for the hypothesized effect of travel time on the dependent variable (H-S_8).

2.5.2 Control variables New Technology Based Firms

For NTBFs, a number of characteristics serve as control variables and will be related to hypotheses on which they might have an effect. In the following, these potential relationships are explicated.

NTBF age

As companies get older, the entrepreneurs in charge of the firms have likely also been with that firm for a longer period of time, and as a result have accumulated more experience. These experienced entrepreneurs could have developed more experience with all sorts of negotiations, contracts and investor behavior that will influence their specific knowledge of the venture capital sector. Therefore, company age is included as a control variable for hypothesized effect $H\text{-}D_{10}$.

NTBF size

By accepting venture capital investment, the entrepreneur cedes a portion of the current equity value of the firm. This means that when there is actually some tangible value on the balance sheet of the firm, the entrepreneur also sells book value to the VC, and not merely a growth opportunity. Take for example a firm that has invested €100.000 in an office funded with € 100.000 of his own money. If 50% of all the shares all sold for €5.000.000, the entrepreneur will also sell € 50.000 of the existing fixed assets. If something now happens to the firm and the firm is declared bankrupt, the investment of the VC will be gone together with the book value of the equity the NTBF originally sold to the VC, thus the entrepreneur of the NTBF loses the €50.000 in tangible assets he sold as well.

Thus, the research controls whether firm size influences the hypothesized effect of the risk of bankruptcy on the motivation to accept venture capital investment ($H\text{-}D_5$) because it increases the direct financial stakes. The proxy for size used in the questionnaire is the annual revenue of the firm. Arguably, the number of employees could also be used as an indication of size, but annual revenue more directly relates to attractiveness for investors as well as to the firms' balance sheet totals.

NTBF development stage

As an NTBF matures over the various stages of development, the value of the product or the service offering is likely to become clearer to both the NTBF and potential investors. Therefore, NTBFs in later stages of development would sooner find the better deal offered by VCs acceptable, influencing the hypothetical positive effect of deal matches on the motivation to accept early stage venture capital funding ($H\text{-}D_9$).

A second change might also take place for NTBFs that mature to a later development stage. Risks for investors decrease as technological feasibility and commercial potential become more obvious in these later development stages, and this could grant the NTBF access to regular sources of capital. Therefore, the effect of this control variable on the hypothesized effect of the availability of substitutes on the acceptance of venture capital ($H\text{-}D_1$) is also included.

NTBFs' legal protection of technology

Those NTBFs that have acquired a certain degree of legal protection of their core technology are intrinsically more valuable and more interesting for VCs. This variable could positively influence the hypothesized effect of a match of proposed deal size with acceptable deal size, as VCs are willing to offer more to ventures that have already secured their Intellectual Property Rights ($H\text{-}D_9$). Three levels of intellectual property rights are measured: 1) a patent (strongest form of protection), 2) a copyright (weaker form of protection) and 3) no IPR protection.

3. Method

3.1 Research design

This research employs a behavioral perspective with regard to the venture capital decision outcome of Venture Capitalists and New Technology Based Firms in the Netherlands. The design of this research is explanatory, as it seeks to understand and test the effects of various factors on the decision outcomes of venture capital providers and potential venture capital recipients. For that purpose, two online surveys (see appendices A and B) have been conducted to obtain data on samples of VCs and NTBFs within the time constraints of this study.

The hypotheses developed in the previous sections stem from empirical research. However, the approach employed in this research is substantially different from the existing literature, primarily in the sense that the actors are self-reporting on their motivations and abilities to engage in venture capital funding. It is imperative to ensure that the questions are interpreted unambiguously by all respondents. To this end, the operationalizations (see section 3.3) have been fine-tuned during 6 qualitative interviews with 3 VCs and 3 NTBFs *before* the questionnaires were launched online. This decreases the ambiguity of the measurement instruments.

3.2 Samples

3.2.1. Sample of Venture Capitalists

The sample of Dutch Venture Capitalists is based on the database of the NVP (*Nederlandse Vereniging Participatiemaatschappijen*), whose members are responsible for 95% of all Dutch venture capital investments within The Netherlands. As such, the set of NVP members approaches the entire population of Dutch VCs (in terms of deal size). The NVP has 65 registered active VCs, and all 65 limited partners will be approached for participation in the research. Within these firms, the questionnaire will be sent to the manager responsible for the VCs investment strategy as he is likely to weight later stage venture capital with early stage investments across the different funds.

In total, 12 Venture Capitalist firms out of the population of 65 firms completed the survey; 2 incomplete questionnaires had to be discarded.

A random sample of the population of Venture Capitalists should reflect the averages of the population regarding key characteristics. To investigate whether this sample indeed reflects the entire population, three sample averages are compared to the population averages: capital under management (a proxy for size), stage focus and international orientation.

In the sample of 12 VCs, the average capital under management was €142 million, close to population average, which is €166 million (EVCA 2010, p. 255). In the sample of 12 VCs, 21.94% of capital was invested into early stage funds. Because there is no adequate national data on foci at the fund level, the fund focus is derived from actual investments by a fund. In 2010, Dutch VCs invested 12.9% of their capital in early stage VCs. But this value seems quite volatile, since in 2009, 21.86% was invested in early stage portfolio firms (EVCA, 2010). In the population, 27 out of 65 VCs (41 %) invested internationally. Of the respondents, 4 out of 12 (33 %) invested internationally.

Whilst comparable in size and stage focus, the VCs in the sample seem more domestically oriented than the VC population. This indicates that the sample is not entirely representative of the

population and that the results obtained from the data on them apply predominantly to the VCs in the sample instead of the VCs in the entire population.

3.2.2. Sample of New Technology Based Firms

The sample of Dutch NTBFs is derived from the database of the Dutch chamber of commerce. An export of this database has been requested with a selection of sectors that are indicated by the EU as medium-high tech, high-tech or as knowledge-intensive service sectors (NACE-2, rev. 2008).

Companies are selected if they are registered between the 1st of January 2005 and the 1st of January 2009. A time period of seven years before 01-01-2012 is chosen because this is the average length of a VC–NTBF relation (Botazzi and Da Rin, 2001; Hege et al., 2003). Therefore, firms who entered in the chamber of commerce after the 1st of January 2005 can be expected to still be eligible for early stage venture capital at the commencement of this study in January 2012. Firms founded after the 1st of January of 2009 are still in their first development phases, for instance getting their first patent, and research shows that this often precedes the venture capital backing of a company (Graham et al. 2010). The invitation will be addressed to the CFO (because this person most likely possesses the information about equity decision making) and alternatively to the lead entrepreneur of the NTBF.

The selected population of Dutch NTBFs from the Dutch chamber of commerce comprised 2007 firms. The initial sample size goal was 2000, but since the amount of firms in the population was so close (2007 firms), the entire selected population was invited to the survey and asked to fill out an online questionnaire. 36 firms completed the questionnaire, resulting in a response rate of 1.8%. This response rate is dramatically low, for which the relevance and sensibility of the subject questioned about might be held responsible. During the pilot interviews the sensitivity of the subject became apparent when the entrepreneurs showed reluctance in talking about the deal size. Additionally, many NTBFs in the sample rejected the invitation because they had no experience or interest in venture capital, for instance because their financing had already been secured. It is thus likely that the actual response rate amongst relevant NTBFs is higher.

The representativeness of the 36 NTBFs for the population will be based on two descriptive characteristics that were present in the extract from the Dutch chamber of commerce database, namely the number of full-time employees (as a proxy for size) and average age. Unfortunately, no other characteristics of the firms in the population are provided by the chamber of commerce.

The average number of full time employees (FTEs) in the selected population is 1.645; the sample of the NTBFs in this research had an average number of 1.956 FTE. The average age of the firms in the population was 5.13 years[2], in the sample the average age of the respondents was 5.02 years.

The sample of the research does appear to have a similar average age and size when compared to the population averages of Dutch NTBFs and therefore indicate that the sample is quite similar to the population of Dutch NTBFs in these high tech sectors within the aforementioned age restrictions. Only 5 out of the 36 of the NTBFs in the sample were VC funded, and this low number in an absolute sense will provide challenges for the quantitative analyses conducted on the sample.

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[2]The Dutch chamber of commerce does not require record a foundation date for all entries, and does not provide the registration dates in an extract. The average age is based on foundation dates for 370 firms.

3.3 Operationalizations for Venture Capitalists

As will be further elaborated in section 3.6, there are two distinct types of indicators of each independent concept used for testing each hypothesis, which together indicate the validity of each hypothesis. Because of the uniformity across perception indicators, these indicators are operationalized together in section 3.3.2. For the actual behavior indicators, each hypothesis will be treated independently in section 3.3.3. But first, the dependent variable will be operationalized.

3.3.1 Dependent variable

The dependent variable is the share of early stage investments within the portfolio of each VC. This is measured as the percentage of total invested capital currently invested in early stage ventures.

Table 1a: Measurement of dependent variable for Venture Capitalists

Dimension	Indicators	Questions	Measure
Portfolio share of early stage	Relative amount of early stage investment	What percentage of the funds invested was invested in portfolio firms whilst these firms were in an early development stage?	100% -> 1: early stage focused 1-99% -> 2:hybrid fund 0% -> 3: late stage focused

The dependent variable (relative amount of early stage investment) is recoded into a three category variable to reflect the three distinctly different practices of venture capital investment: late stage focused, early stage focused or focused on both development stages (hybrid VCs). One VC commented: *"Our VC firm, and many VCs like us, focus on our [late stage venture capital] investment segment because of the high level of specialization in human capital required."* A late stage VC with even the smallest early stage investment fund would already need to retain that additional unique specialization, and is therefore considered an hybrid investor rather than a predominantly late stage VC in order to reflect their more extended skill portfolio.

3.3.2 Perception indicators

The first type of indicators comprises the perception questions, i.e. the self-reporting of the respondents on their disposition towards a certain motivation or ability. These motivations or abilities can either be stimuli for early stage venture capital investment, or they can be barriers. The expected direction of a hypothesized effect has been stated in the Theoretical Framework.

For every hypothesis, two perception indicators are included. The first is formulated as a statement in the expected direction of the hypothesis and it measures the perceived magnitude of the expected effect. The second indicator measures the perceived importance of every motivation or ability regarding the dependent variable. It is preferable to rate the importance on a ranking scale, since this increases the contrasts in the data because every hypothesis gets a unique score. However, The VC case had 13 hypotheses, and ranking these on a top 13 scale was considered to be too complex for a question, which is why the importance of all VC hypotheses was rated separately by the respondents.

Table 1b presents the perception indicators of the perceived magnitude of the effect and the perceived importance of each independent concept defined in the hypothesis.

Table 1b: Measurement of perception indicators for Venture Capitalists

Hyp.	Question
H-S$_1$	The total return/risk ratio for the entire early stage deal flow was favorable[3]
	How important was the return/risk ratio for your decision to provide a portfolio company with early stage capital during the past 3 years[4]?
H-S$_2$	The reputation hazard associated with early stage investments is too large.
	How important was reputational hazard of early stage investments for your decision to provide a portfolio company with capital during the past 3 years?
H-S$_3$	The amount of capital available for investment was too limited.
	How important was availability of capital for early stage investments for your decision to provide a portfolio company with capital during the past 3 years?
H-S$_4$	The competition with public sources of capital hindered investment.
	How important was the competition with public sources of capital for your decision to provide a portfolio company with capital during the past 3 years?
H-S$_5$	There was sufficient opportunity to co-invest with other venture capital funds.
	How important was the opportunity to co-invest with other VCs for your decision to provide an early stage portfolio company with capital during the past 3 years?
H-S$_6$	The quality of early stage investment proposals was good.
	How important was the quality of the early stage investment proposal for your decision to provide an early stage portfolio company with capital during the past 3 years?
H-S$_7$	The quantity of early stage investment proposals was sufficient.
	How important was the quantity of early stage investment proposals for your decision to provide an early stage portfolio company with capital during the past 3 years?
H-S$_8$	The travel time to portfolio companies was too long.
	How important was travel time to firms for your decision to provide that firm with capital during the past 3 years?
H-S$_9$	Differences in national legislation foreign countries hindered foreign investment
	How important were differences in legislation with the country where the portfolio company is located for your decision to provide that company with capital during the past 3 years?
H-S$_{10}$	The amount of referrals and recommendations from known partners was sufficient.
	How important were referrals or recommendations of known partners to the portfolio companies for your decision to provide that company with capital during the past 3 years?
H-S$_{11}$ + H-S$_{12}$	For most early stage business proposals, your fund has specialist knowledge on the sector / development stage
	How important was your experience with the sector / development stage of portfolio companies for your decision to provide that company with capital during the past 3 years?
H-S$_{13}$	The size of a deal often corresponds to the preferred size of an investment.
	How important was the match of deal size with preferred investment size for your decision to fund that deal during the past 3 years?

All effect indicator values are first recoded around 0 (meaning a deduction of 3 on all values) and then multiplied by -1, so that disagreement is a negative value, and agreement a positive value.

The importance indicator can be seen as a mediating influence on the magnitude of the perceived effect of a motivation or ability: if motivations or abilities are considered more important, the magnitude of their effect should be greater. To properly reflect this, the importance indicator is recoded before multiplication with the effect indicator. A high reported importance should increase the deviations from the center value of the effect indicator, and low importance indicators reduce the deviations. A score of 1 (extremely important) becomes 2, a score of 2 (very important) becomes

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[3] The indicators on the effect of a motivation or ability are measured as a 5-point likert scale: (strongly agree (1), agree (2), no opinion or N/A (3), disagree (4), strongly disagree (5))

[4] The indicators on the importance of a motivation or ability are measures as a 6-point likert scale (extremely important (1), very important (2), important (3), a little important (4), not important (5) or N/A (missing value)).

1.5, a score of 3 (important) becomes a score of 1, a score of 4 (of little importance) becomes 0.5 and a score of 5 (not important) becomes 0 (The actual linear transformation is: *recoded importance indicator = -0,5 · original importance indicator + 2.5*). These computations are done at case level, not at the category level. The result of the multiplication then is that deviations from the mean are more readily interpreted as being larger when the respondent has assigned a high importance to the value.

3.3.3 Actual behavior indicators

The second indicator type contains actual behavioral indicators, which differ for each hypothesis. All motivations and abilities are now reviewed with their respective actual behavior indicators.

H-S$_1$ Return-risk ratio (+)

To establish the return risk ratio of the VCs portfolios, respondents are first asked to estimate the return on their current portfolio in terms of the Fair Market Value (FMV) of their portfolio[5]. For the risk side of the equation, respondents are asked to rate the frequency of devaluations on their portfolio, which can occur either in the form of write-downs, when the investment stays in the books but at a reduced value, or as a write-off, when an investment is considered lost forever (defaulting).

Table 2: return-risk ratio actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Return	Early stage return	What was the growth in FMV of your funds' <u>early stage</u> investments during the past 3 years?	7-point scale, (<0%, 0-5%, 6-10% , 11-20% , 21%-30%, >31%, No change/no valuation)
	Non early stage return	What was the growth in FMV of your funds' <u>other</u> investments during the past 3 years?	7-point scale, (<0%, 0-5%, 6-10% , 11-20% , 21%-30%, >31%, No change / no valuation)
Risk	Non early stage write-offs	What percentage of non-early stage investments has been <u>written-off</u> during the past 3 years?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
	Non early stage write-downs	What percentage of non-early stage investments has been <u>written-down</u> during the past 3 years?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
	Early stage write-offs	What percentage of early stage investments has been <u>written off</u> in the past 3 years?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
	Early stage write-downs	What percentage of early stage investments has been <u>written down</u> in the past 3 years?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)

Both return- and risk rates are converted to scalar variables using category center values. The write-off and write-down risk variables are added to form a total risk variable. Write-downs are more limited in their economic impact, since the investment is only written off partially, and should be weighted properly. Cumming and MacIntosh (2003) investigated the partial write-off exit and identified them as living dead investments, i.e. the portfolio companies have grown into viable economic entities but will not realize the growth potential expected at the onset of investment. Investors are then expected to lose some money on their investment but not all of it, and write downs are weighted as half as financially damaging as complete write-offs in the total risk variable.

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[5] Please note that early stage focused VCs cannot indicate investment performance of non-early stage (other) investments, and that late stage specialized VCs cannot comment on early stage investment performance.

H-S₂ Reputational hazard (-)

The first actual behavior indicator for the potential reputational damage of very risky investments is whether the venture capitalist has previously rejected deals to prevent reputational harm.

Additionally, there might be effects that would increase the reputational effects of early stage investments, such as increased publicity of early stage deals or extra importance assigned to these deals by fund providers. Van Osnabrugge and Robinson (2000, p. 29) suggest that in small communities like the VC community, reputation effects *"echo loudly"*.

The 3 indicators treat different aspects of reputational effects, so the indicators are not combined in one indicator. The hypothetical effect of reputational hazard is considered to be supported when 2 out of the 3 indicators (in table 3) support reputational hazard as a barrier to early stage investment.

Table 3: reputational hazard actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Reputational harm	Historical decisions	Which percentage of previous early stage investment proposals was rejected in the past three years because of possible reputational damage?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
Amplifiers of reputation effects	Extra publicity	Were early stage investments announced in public via media more or less often than later stage investments in the past three years?	5 point likert scale (much more often, more often, not more or less often, less often, much less often)
	Weight for Investors	Were early stage investments more or less important than investments in later stages to institutional investors in their decision to invest in your venture capital fund during the past three years?	5 point likert scale (much more important, more important, not more or less important, less important, much less important)

H-S₃ Shortage of capital (-)

A thoroughly underfinanced sector could force tough choices on VCs which might drive or keep them out of certain development stages. A potential cause of this capital shortage is the Prudent Man Rule. This prudent man rule was an institutional fund provider side constraint before its abolishment in 2005. However, habitual abiding of the rule by institutional fund providers could result in a lack of capital for a VC fund and could be a deterrent not to invest in early stage portfolio firms.

For this hypothesized effect, the research will first inquire if there is any indication of prudent man effects still causing capital constraints for VCs. The actual behavior indicator that relates to this, concerns the importance of institutional fund providers to a VC, measured both as the occurrence of institutional fund providers in a top three and as their occurrence in bottom three rankings of as least important investors for a fund. A final variable of institutional involvement is computed as the occurrence of institutional fund providers as top 3 investors subtracted by the occurrence of institutional fund providers as bottom 3 investors. Thus, a score of 3 would result if institutional fund providers form the entire top 3, and none in the bottom three (3 − 0 = 3). The minimum score of -3 is achieved if institutional fund providers comprise the bottom three, and none are top three of fund providers of a VC (0 − 3 = -3).

The second indicator for this hypothesis is the way the fund would distribute new capital over investment stages. When a VC would not commit new capital to the early stage market, providing more capital to that particular VC would not impact the early stage venture capital market.

Dimension	Indicator	Questions	Measure (increasing numerical values)
Source of Existing Capital	Top investors	Create a top three of most important fund providers in your venture capital fund in the past three years.	Occurrences of banks, Insurance companies, pension funds, capital markets, non-financial institutions, fund-in-fund, public sector, private persons and other in top/bottom three.
	Bottom investors	Create a top three of least important fund providers in your venture capital fund in the past three years.	
New capital	Destination of new capital	A new investor wants to invest €5.000.000 outside of the current fund structure, how would your firm divide these funds over the development stages?	11 point scale (€0 early stage, € 5.000.000 later stage, € 500.000 early stage, € 4.500.000 later stage etc.)

The hypothetical effect of a shortage of capital is considered to be supported by past behavioral indicators when new capital will be used to diversify into or increase existing early stage investments. The rankings of institutional fund providers could additionally indicate prudent man behavior still having an effect.

H-S$_4$ Competition with public venture capital funds (-)

If competition with public venture capital funds is an important deterrent for investment in early stage portfolio firms, it is likely that the early stage VCs have had several encounters with public venture capital funds in previous deals. In the first interviews it became evident that public venture capital activities in The Netherlands were limited to a few regional development funds. Because of this relative absence of public VCs, the indicators are re-phrased in terms of public sources of capital (i.e. subsidies). If the public sources of capital forced them out of potential deals in the early stage VC market, this outbidding could have had a harmful effect on the early stage VC market.

Additionally, VCs might have turned away from deals when regional development funds were involved, as public venture capital has been shown to decrease the efficiency of portfolio firms, increasing the risk and decreasing the potential returns of portfolio firms (del-Palacio et al., 2010).

Table 5: competition with public venture capital funds actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Actual interaction	Outbidding	How frequently has your venture capital firm in the past three years lost a deal due to the fact that he company found public sources of capital during the past 3 years?	5 point likert scale (never, rarely, sometimes, often, very often.)
	Presence Effect	In what way has the presence of a public VC (such as a regional investment cooperation) in a deal changed your motivation to invest in that deal during the past 3 years?	7 point likert scale (strongly positive, positive, somewhat positive, no effect, somewhat negative, negative, strongly negative).

The presence effect is subtracted by 4 so that a neutral value gets a score of 1. Then outbidding and presence are added to yield a new variable measuring the total effect of public VCs. The higher the resulting score (i.e. often outbid and strongly negative effect of their presence in a deal), the more they would act as a barrier to investment. The resulting values then lie on a scale of -3 to 7.

H-S₅ Syndication opportunities (+)

Deal syndication provides a VC with opportunities to diversify away risk or get access to the complementary assets of other VCs. Early stage investments are often more risky and require more specialized assets, increasing the benefit of syndication amongst Venture Capitalists. Thus, if syndication indeed stimulates VCs to invest into early stage portfolio firms, the early stage tier should show higher syndication frequencies. Additionally, VCs might be motivated but unable to syndicate. Therefore, a desired change in syndication frequency is also included as a variable.

Table 6: lack of syndication opportunities actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Actual syndication	Syndication portion	What percentage of your current investment portfolio is co-invested in by other VC firms?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
Syndication preference	Desire to syndicate	Would your venture capital firm syndicate more or less, given that enough opportunities existed?	5 point likert scale (much more often, more often, not more or less often, less often, much less often)

The indicators are combined in an arbitrary way in order to express a net desired syndication level. The desire to syndicate more should reflect a higher net desired level of syndication than a VCs current syndication level. Conversely, a desire to syndicate less should reduce the net desired syndication level. Therefore, a transformation is executed which increases a VCs current syndication level with 30 % (much more often) 10% (more often) 0 % (not more often or less often) or reduces it by 10 % (less often) or minus 30% (much less often). This transformation means the theoretical scale now progresses from -30% (minimum syndication) to 130% (maximum syndication).

H-S₆ Quality of business proposals (+)

VCs might have considered the quality of business proposals to be too low for investment during the past three years. If this is the case, business proposals should have been rejected relatively early in the assessment procedure, because high quality proposals are expected to last longer under careful scrutiny. The various stages of screening are coined different by various VCs, but an accepted sequence consists at least of an initial screening followed by a thorough deal evaluation and the process concludes with the actual investment deal (Hall and Hofer, 1993).

The quality of a business proposal is hard to assess. To increase instrumental validity, four extra sub-categories for quality are included in the questionnaire. These are: knowledge of the product, knowledge of the market, management qualities of the developing team and the qualities of the financial calculations. This categorization is based on Petty and Gruber (2011).

Table 7: quality of business proposals actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Actual quality	Early stage amount	What is the total amount of early stage business proposals received by your venture capital firm in the past three years?	5 point scale (0-50, 51-100, 101-300, 301-500 and >501)
	Screening	What portion of all received early stage business proposals got through the first screening phase of your venture capital firm during the past three years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)
	Project evaluation	What portion of all early stage business proposals got through the second screening of your venture capital firm during the past three years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)
	Actual investments	How many early stage proposals has your venture capital funded in the past three years?	5 point scale (0-5, 6-10, 11-15, 16-20, >21)

The quality indicators are based on the ability of the proposal to withstand the scrutiny of the VC without being rejected. For the entire deal flow, a high quality would result in most proposals lasting into later evaluation stages. In other words: quality here is indicated by the rate of deal retention, if the higher rates occur at earlier stages the proposals are of better quality.
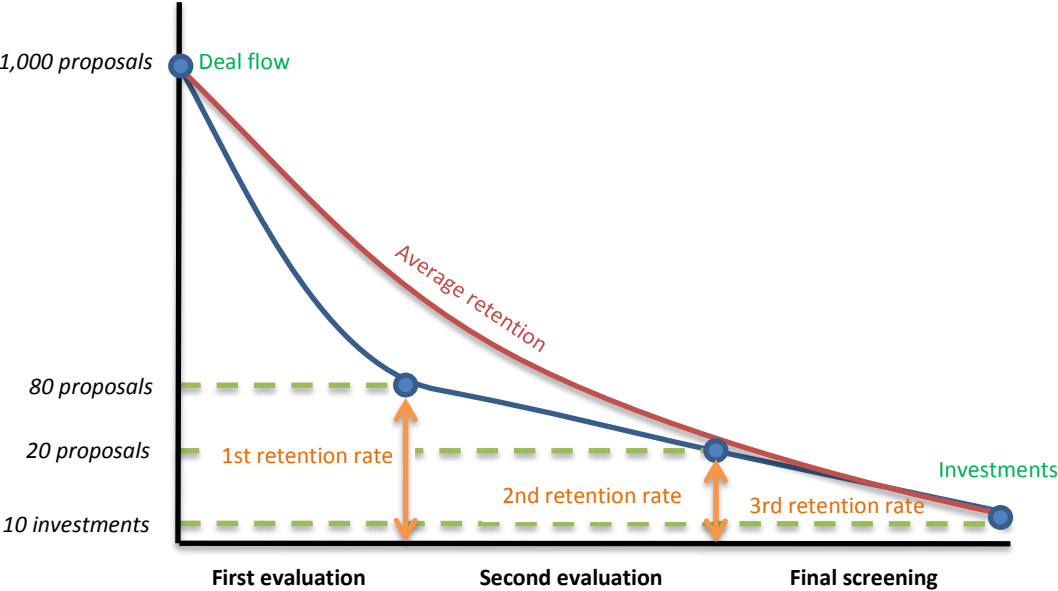
Figure 2: Deal retention process with below average retention rates and thus below average quality of business proposals.

As figure 2 shows, there is deal retention in each evaluation phase, so there are three retention rates in total. Two retention rates are directly recorded in the questionnaire, the third is calculated using the actual number of early stage investments. A higher retention rate in the earlier phases should indicate a higher quality, but this can only be maintained when the retention rate in the first evaluation stage is higher than the average rate, otherwise it could just be a habitual effect (i.e. a very lenient attitude of a venture capitalist). Therefore, the research calculates the deviations of retention rates from the geometric average retention across phases. In the example of figure 2, the retention rates are 8%, 25% and 50%. Across phases, the retention rate is $\sqrt[3]{0.01}$ = 0.215 or 21.5% since 1% makes it across all three phases. Therefore, the deviations of the average rate per phase would be 1) 8% − 21.5% = -13.5%; 2) 25% - 21.5% = 4.5% and 3) 50% - 21.5% = 28.5%.

To account for the higher quality of deals when said deals are retained in the earliest phase, the deviation of the retention rate of the first phase is multiplied by 3, and that of the second by 2, whilst the third is left untouched. Finally, a sum of those adjusted retention rates then yields the eventual quality indicator. Thus, the example of figure 2 would yield a score of -7.5% (3 * -13.5% + 2 * 4.5% + 28.5 %). The theoretical maximum and minimum scores are both infinite, since the skewedness of the exponential relationship could be infinitely skewed in both directions.

H-S₇ Number of business proposals (+)

H-S₇ Number of business proposals (+)

The inflow of business proposals could lack the volume for a VC to develop or retain the capability of assessing, monitoring and exiting early stage venture capital investments. The actual inflow of business proposals vis-à-vis early stage business proposals will be measured to determine if there is a relationship between the relative number of early stage proposals and the stage focus of a venture capitalist.

Table 8: quantity of business proposals actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Actual number of proposals	Total amount	What was the total amount of business proposals received by your venture capital firm in the past three years?	5 point scale (0-100, 101-300, 301-500, 501-1000 and >1001)
	Early stage amount *Same question as early stage amount in table 7*	What was the total amount of early stage business proposals received by your venture capital firm in the past three years?	5 point scale (0-50, 51-100, 101-300, 301-500 and >501)

The two indicators will first be transformed to scalar variables using the category center values. Then, the number of early stage proposals will be divided by the total number of proposals to arrive at an early stage deal ratio.

H-S₈ Geographical distance (-)

H-S₈ Geographical distance (-)

If the distance to a portfolio firm is important to the VC, it is likely that portfolio firms that are located relatively close to the VC are more likely candidates for investment. To investigate this, the questionnaire measures the average travel time to portfolio companies. There might be other conditions that increase the motivational effect of travel time, such as the number of visits per month and the management style of the venture capitalist (the intensity of monitoring and assisting portfolio firms, the categories are based on MacMillan et al. (1988)). Geographical distance is measured here in terms of travelling time, because this relates more directly to the time investment of the VC than a geographical distances expressed in kilometers.

Table 9: geographical distance actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Impact distance	Average travel time	What is the average travelling time to the early stage companies in your firms' current portfolios?	5-point scale(0-10 min, 11-30 min, 31-60 min, 61 – 120 min and >121 min)
	Number of visits per month	What is the average number of visits to a company in your portfolio per month?	5 point scale (once, twice, three times, four times, more than four times)
	Management involvement	How would you describe the intensity of your involvement with portfolio companies?	5-point scale (Hands-off, Laissez-faire, Balanced, Close Tracking, Co-management)

Because the three indicators measure distinctly different aspects of travel time, they will not be combined into a single indicator. The hypothetical effect will be considered supported by the actual behavior indicators when at least two out of the three indicators show the expected trend across the early stage involvement of VCs.

H-S₉ National legislation and foreign investment (-)

H-S₉ National legislation and foreign investment (-)

When differences in legislation between EU countries are an important constraint, actual international investment levels should be limited. Meuleman and Wright (2011) show that local partners are important in decreasing the uncertainties associated with international investments. Therefore, when a firm has cooperated more with local partners in foreign deals, potential problems associated with international investment are expected to be a barrier to investments abroad.

Table 10: national legislation and foreign investment actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Inter-national legislative uncertainty	Actual foreign investments	What portion of your firms' current investments is invested abroad?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)
	Local partners	For which percentage of your foreign investments did your firm cooperate with foreign local partners?	12 point scale (0%, 1-10%, 11-20%, 21-30%, …, 91-99%, 100%)

Difficulties with international investment are expected to be felt most when actual foreign investment levels are low and when these (scarce) international investments are conducted in cooperation with a local partner. The combined indicator to reflect this is calculated as:

$$\frac{(1 - actual\ foreign\ investment\ ) + cooperation\ with\ local\ partners}{2}$$

The theoretical maximum value of this indicator is 100% (when actual foreign investment is 0% and cooperation with local partners is 100%. The theoretical minimum is 0 (100% is invested internationally, 0% is invested in cooperation with a local partner).

H-S₁₀ Referrals and recommendations by intermediaries (+)

H-S₁₀ Referrals and recommendations by intermediaries (+)

Intermediation by third parties between VCs and NTBFs can be important to the VC as a scouting mechanism for potential deals. If intermediation is successful in stimulating early stage venture capitalists to invest more into early stage, it is to be expected that the actual rates of deal acquisition via intermediaries are higher in the early stage tier of the market. The research records both referrals (simply establishing contact) and recommendations (a referral with the quality guaranteed by the referring party).

Table 11: referrals and recommendations by intermediaries' actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Intermediary activity	Portion of referrals	What portion of the early stages business proposals was referred to you by a partner of your firm during the past three years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)
	Portion of recommendations	What portion of early stages business proposals contained a recommendation of a partner of your firm during the past three years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)

A final intermediation variable is constructed by adding the two indicators, but while weighting the recommendations at twice the rate of referrals, since a recommendation is a more intensive form of intermediation than simply connecting two actors with a referral.

H-S$_{11}$ and H-S$_{12}$ Sector and stage experience (+)

To adequately assist a portfolio firm, it is beneficial to have certain levels of experience to execute the monitoring and advice functions (c.f. Lerner, 1994). The sector experience relates to the specific industry of the portfolio company where practiced VCs have technological know-how and/or well established contacts. Experience can also relate to the development stage of the company when for instance the VC is proficient at *going public* through an IPO.

If early stage VCs invest in a smaller number of sectors, they are likely more sector specialized, and that would support the hypothesized effect that experience stimulates VCs to get into early stage investments. Sector specialization means that fewer sectors suit a VCs' investment criteria, and consequently more deals should be rejected on the basis of sector mismatches.

Table 12: sector and investment experience actual behavior indicators

Dimension	Indicator	Question	Measure (increasing numerical values)
Sector experience	Sector spread	In how many different sectors does your company invest?	Multiple options (NACI-rev 2 (med+)high tech and knowledge intensive services)
	Experience lack	What portion of deals was rejected due to a lack of sector experience in the past three years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)
Investment stage experience	Experience lack	What portion of deals was rejected due to a lack of experience with the investment stage in the past 3 years?	10 point scale (0-10%, 11-20%, 21-30%, …, 91-100%)

For sector experience, the two indicators are combined to form a final sector experience indicator. The occurrence of rejections due to the lack of sector experience is divided by the number of sectors that a VC invests in. In this way, higher rejections rates on the basis of lack of experience and reduced sector spread result in higher sector experience scores. Conversely, rejecting rarely because of sector experience shortages and focusing on many sectors will result in the lowest scores.

For investment stage experience (as opposed to sector experience), only the rejection rate is used as an indicator. An indicator for actual investments across the different development stages is excluded because it is considered to be too closely related to the dependent variable. The indicator would measure a characteristic very similar to the portfolio share of early stage of a VC, and therefore the relation could a conceptual resemblance instead of a relationship between independent variables.

H-S$_{13}$ Match of fund size with deal size (+)

The last VC-side hypothesis concerns the match between preferred deal size and proposed deal size (by the NTBF). If the deal is too small for a VC, the VC might not be interested because the possible revenues are too small for the costs of screening, supervising and exiting the investment. The deal could also be too big for a VCs planned portfolio, limiting diversification opportunities across multiple deals. If deal mismatches are less frequent for early stage VCs, the hypothesized positive effect of matching deal sizes on the portfolio share of early stage investments is supported by the data.

Table 13: match of fund size with deal size

Dimension	Indicator	Question	Measure (increasing numerical values)
Actual match	Deal too large	How often was an early stage deal too large for your venture capital fund to invest in during the past 3 years?	5-point likert scale (very often, often, sometimes, rarely, never)
	Deal too small	How often was an early stage deal too small for your venture capital fund to invest in during the past 3 years?	5-point likert scale (very often, often, sometimes, rarely, never)

Because both indicators reflect opposite but equally important mismatches, they are added and then divided by 2 and form a total mismatch variable.

3.4 Operationalizations for New Technology Based Firms

First, the dependent concept and then the two types of indicators of each independent concept for the NTBFs are operationalized. The hypothesis testing procedure for the NTBFs (which is presented in further detail in section 3.6) is similar to the Venture Capitalist case since it is based on the same two indicator types for each independent concept where effects on the dependent concept are specified for each hypothesis. The first of these indicator types is the perception indicator, which measures the magnitude of a hypothesized effect on the acceptance of Venture Capital funding and weights this with their reported importance. The second type of indicators comprises of actual behavior indicators, which measure actual manifestations of certain behaviors.

3.4.1 Dependent variable

The dependent variable for the New Technology Based Firms is related to the significance of venture capital in their capital structure. It is measured as the multiplication of two indicators, namely the relative amount of external financing in the capital structure and the percentage of venture capital in the external financing, to arrive at the actual portion of venture capital in a firm's capital structure.

Table 14: Measurement of dependent variable for NTBFs

Dimension	Indicators	Questions	Measure
Amount of early stage venture capital funding used	Leverage rate	What is the composition of equity / external financing?	11 point scale distribution (100% equity/0% external financing(1), 90% equity/10% external financing(2) etc.)
	VC portion of external financing	What portion of external financing consists of venture capital?	12 point scale distribution (0% (1), 1-10% (2) …. 100% (11) and N/A (since there is no external fin.) (12).

The resulting multiplied indicator is recoded into a dichotomous dummy variable (1 = venture capital is present in firm, 0 = no venture capital is present) to reflect only two different outcomes (yes/no) of the decision to accept venture capital. It is expected that the firms that accepted venture capital funding had a different appreciation of the pros and cons of early stage venture capital investment.

3.4.2 Perception indicators

As with VCs, there are two different perception indicators, wherein the first one relates to the magnitude of a hypothesized effect and the second type of indicator measures the importance of that hypothesized effect.

In contrast to the VCs, the NTBFs were asked to create a ranking of the importance of the 10 hypothesized effects (instead of the separate rating of the importance of every hypothesis as done by VCs). The ranking of the hypothesized effects ensures that no two hypotheses can be rated equally important, and that an ordering of effects must be made by the respondent.

Table 15 reviews the different statements related to the magnitude of the hypothesized effects (the first indicators) on the NTBFs equity share of venture capital.

Table 15: *Measurement of perception indicators for NTBFs[6]*

Hyp.	Question
H-D$_1$	There were sufficient other sources of capital (such as debt or subsidies) available
H-D$_2$	The opportunity to regain control in a later stage was sufficiently present
H-D$_3$	The investing venture capitalist would add significantly to the value of the company

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[6] indicators on the magnitude of the effect of a motivation or ability are measured as a 5-point likert scale:
(strongly agree (1), agree (2), no opinion or N/A (3), disagree (4), strongly disagree (5))

H-D₄	Anticipated social consequences of a failure reduced your willingness to accept venture capital	
H-D₅	Possible financial consequences of a bankruptcy reduced your willingness to accept venture capital	
H-D₆	The travel time to the VCs known to you was too large	
H-D₇	There were enough referrals and references to venture capitalists by third parties	
H-D₈	There was enough venture capital available in the market	
H-D₉	The terms offered in potential deals with VCs were good enough for you	
H-D₁₀	You possessed sufficient knowledge of the venture capital market to make an informed decision	

As with the VCs, all effect indicator values are first recoded around 0 (meaning deducting all values by 3) and then multiplied by -1, so that disagreement is a negative and agreement is a positive value.

As mentioned, the importance indicator is measured as a ranking of effects. The hypothetical effect considered most important got a score of 1, whilst the least important effect received a score of 10.

The recoded importance indicator should be highest when an effect is ranked first (recoded value=2), and lowest (recoded value=0) when the rank is ranked last (10th place). If that recoding is indeed achieved, the result of the multiplication of the recoded importance indicator with the recoded effect indicator is that deviations from the mean in terms of effect are more readily interpreted as being larger when the respondent has assigned a high importance rank to the effect.

A linear transformation is conducted where an original value of 1 is recoded to equal 2, and an original value of 10 is recoded to become 0. The formula for this transformation is:

$$Recoded\ importance\ indicator = -\frac{2}{9} \cdot original\ importance\ indicator + \frac{20}{9}$$

3.4.3 Actual Behavior indicators

H-D₁ Availability of substitutes (-)
Venture capital funding can be substituted by two distinct alternatives: no external financing or regular means of external financing. The substitution effect of regular financing is indicated by the ease with which the company could access this source of capital. Additionally, the firm could avoid external financing altogether by declining to invest or by financing them with retained earnings. The latter substitute would be indicated by an amount of required external financing equal to 0.

Table 16: availability of substitute's actual behavior indicators

Dimension	Indicator	Question	Measure
Sub-stitutes	Capital requirement	What amount of external financing did your firm require during the past three years?	Scalar variable
	Regular financing	How do you judge the ease with which your company had access to regular means of financing during the past 3 years?	5-point likert scale (very easy(1), easy(2), average(3) hard(4) very hard(5)

The indicators are combined in an arbitrary way to arrive at a final substitute indicator. If firms do not require any external financing at all, the ease with which they could acquire that financing is rendered irrelevant. The firms that reported to require no external financing receive a score of 1 in the combined substitute indicator and the ease with which it could be acquired is ignored. The other firms did indicate to require external capital. For them, the regular financing indicator is used. This regular financing indicator, however, is added by 1 to distinguish between "no external financing needed" (score of 1) and "very easy to get external financing via regular means" (score of 2). The minimum score of the combined indicator is 1 (no ext. finance needed = 1) and the maximum score is 6 (very hard to come by external financing (+5) and there is a need for external financing (+1).

H-D₂ Retaining and regaining control (+)

H-D$_2$ Retaining and regaining control (+)

The venture capital acceptance decision can be framed as a tradeoff between control and growth of the NTBF. A VC can speed up the growth of a firm, but does so at a cost. Hogan and Hutson (2005) found that NTBFs sometimes prefer equity over debt, and in those cases control desires are inferior to the growth ambitions that are best served with VC involvement. This study will measure this trade-off accordingly.

Table 17: retaining and regaining control actual behavior indicator

Dimension	Indicator	Question	Measure
Desire for control	Growth or control preference	Three years ago, would you have preferred to own 10% of a € 5,000,000 company or 100% of a € 500,000 company?	Dichotomous variable. 100% of 500.000 company (1), 10% of 5.000.000 company (2).

H-D$_3$ Added value by venture capitalist (+)

Empirical research shows that VCs add value to their portfolio firms (e.g. Engel, 2002). When NTBFs are aware of this, it is expected to increase their acceptance of venture capital. This research will ask NTBFs to estimate the impact a VC had (or would have had) on growth. If this consideration is indeed present, the data should reflect that NTBFs with venture capital funding estimated higher growth impacts of the VC than NTBFs who are not financed with early stage venture capital.

Table 18: added value by VC actual behavior indicator

Dimension	Indicator	Question	Measure
Added value	Perceived extra growth	During the past 3 years, how do you think the (a) VC (would have) affected the growth percentages of your firm?	6 point scale (<0% (1); 0-5% (2); 6-20% (3); 21-50% (4); 51-100% (5); >100% (6))

H-D$_4$ Fear of social stigmatization after business failure (-)

The effects of social stigmatization after business failure can lead entrepreneurs to refuse to declare their venture bankrupt and thus remain involved in an economically unviable business. Within a VC portfolio, such firms are referred to as *"living dead"* firms (Ruhnka et al., 1992; Cumming and MacIntosh, 2003). It is hard to measure this directly due to the social desirability of answers, and therefore the indicators below relate to business performance. Companies with lowest net profits during the past three years and minimal growth expectations are identified as closer to the 'living dead' firms that will not realize expectations, but are maintained to avoid the stigmas of bankruptcy.

Table 19: stigmatization after failure actual behavior indicator

Dimension	Indicator	Question	Measure
Living Dead	Financial return	What was the average net annual profit of your company during the past 3 years?	6 point scale (<0 (1); €0 (2); €1–€5.000 (3); €5.001–€50.000 (4); €50.001-€500.000 (5); >€500.001 (6))
	Growth expectation	What was the expected annual growth of net profit during the past 3 years?	7 point scale (<0% (1); 0% (2); 1%–5% (3); 6%-10% (4); €11-20% (5); 21%-50% (6); >51% (7))

The two indicators are multiplied with each other and then the multiplicative inverse of a score is used (1 / original score). Resulting high values reflect low returns and/or low growth rates, resulting low values reflect high return and/or high expected growth. The theoretical scale is 0.023 (1/42) (maximum growth expectation, maximum net profit) to 1 (expectation of contraction and a net loss). The inverted combined indicator is expected to relate in a negative way to the motivation to accept early stage venture capital. Unviable 'living dead' firms (with a high score on this indicator) are considered more likely to experience the fear of social stigmatization as a barrier to accept venture capital funding if they are not backed by a venture capitalist.

H-D₅ Legal effects of bankruptcy (-)

Apart from the societal judgment of the entrepreneur whose enterprise has failed, a bankruptcy also has legal and financial consequences which can be significant, especially in Europe (e.g. Armour, 2004). Many entrepreneurs stay employed part-time to cover running-expenses and thus decrease the financial risk they run (Carter et al., 2007). Entrepreneurs who have a larger part time involvement are expected to have a higher appreciation of the negative effects of a bankruptcy and are considered less likely be venture capital backed. This finding would support the hypothesized negative effect of bankruptcy on the acceptance to accept venture capital funding by a NTBF.

Table 20: legal effects of bankruptcy actual behavior indicator

Dimension	Indicator	Question	Measure
Fear of the consequences of bankruptcy	Part-time employment	Have you had a part-time paid job next to your role as an entrepreneur during the past three years, and if so, for how many hours per week on average?	Scalar variable (0 = no part time employment, n = number of hours per week spent on part time job).

H-D₆ Lack of VC local involvement (-)

The NTBF might have a preference for VCs located nearby because they have more knowledge of local markets, more affiliation with other local partners and it might be easier to build a trust relation when the distance to the other party is short.

If non VC-backed NTBFs indicate that both of these issues are more important than VC funded NTBFs indicate, the lack of local involvement of the VCs could be considered as a factor that is keeping the NTBFs from accepting venture capital.

Table 21: lack of local involvement actual behavior indicators

Dimension	Indicator	Question	Measure
Distance to VC	Importance of local knowledge	How important was the knowledge the investor had of the local market to your choice for an investor during the past 3 years?	6-point scale (Not important(1), a little important (2), important(3), important(4), very important(5), N/A (missing value))
	Importance of trust relationship	How important was the opportunity to develop a trust relationship with an investor to your choice for an investor during the past 3 years?	

Since the indicators have the same scale, and both questions record the importance of a distance effect, the indicators are added and then divided by 2 to arrive at a combined distance importance indicator, where higher scores indicate a higher importance of the effect of geographical distance. The scale for this indicator is the same as scale of the original indicators.

H-D₇ Intermediation by third parties (+)

Any third party could connect an NTBF to a VC, either with a mere referral or a full recommendation. Similar to the VC case, this intermediation is also measured at the NTBF side. However, there is a key difference. VCs can judge a business proposal extensively before they invest, but an NTBFs' judgment of an investor is a more difficult matter since there is no readily available framework (as opposed to VC investment criteria). Also, where intermediation for VCs should be about quantity in order to receive enough deals, with NTBFs it should concern quality since a single capable VC could fulfill the NTBFs' needs. Thus, the indicator relates to the quality impact of a recommendation, not its quantity.

If venture backed NTBFs report higher efficacies of intermediation, the positive hypothesized effect of intermediation on the acceptance of early stage venture capital by the NTBF capital is supported.

Dimension	Indicator	Question	Measure
Inter-mediation	Importance of recommendations	How important have recommendations been to consider accepting venture capital from a VC during the past 3 years?	6-point scale (extremely important(1), very important (2), important(3), a little important(4), not important (5) N/A (missing value))

H-D$_8$ Lack of venture capital funding (-)

A lack of early stage venture capital available in the market could be a severe constraint to the functioning of the early stage venture capital market. The shortage of venture capital could manifest itself in several ways, but most of them are expected to covariate with possible effects of the quality of the business proposition of the NTBF. For example, an NTBF receiving a better deal (at lower cost) could relate to the quality of the deal, and not to a surplus of available early stage venture capital in the market. Therefore, the actual behavior indicator for this hypothesis is based on the number of meetings an NTBF had with VCs to indicate the presence of early stage oriented VCs in the market.

It is expected that VC backed NTBFs have had more encounters with VCs, whilst a lack of encounters experienced by non VC-backed NTBFs decreases their acceptance of venture capital funding.

Table 23: lack of venture capital funding actual behavior indicator

Dimension	Indicator	Question	Measure
Availability of ventur capital	Past interactions	With how many different venture capital firms have you had a meeting during the past three years?	5-point scale (0 (1); 1 (2); 2 (3); 3-5 (4); >5 (5))

H-D$_9$ Match in deal valuation (+)

A mismatch between the NTBF and the VC might arise over of the value of the NTBF's business proposition. This should be indicated by a high number of negotiation rounds and a simultaneous low number of acceptable deals because the parties were not able to agree on a deal. This hypothesis is framed as a positive effect since a match between an acceptable deal and the VCs offering is the most straight forward indicator for this hypothesis.

If valuation matches are increase the acceptance of venture capital amongst NTBFs, we would expect the ratio of success in the negotiations (in terms of acceptable deals) to be lower amongst non-VC backed NTBFs compared to the negotiation success ratio of the NTBFs that are backed by Venture Capitalists.

Table 24: mismatch in deal valuation

Dimension	Indicator	Question	Measure
Deal matche	Success rate of negotiations	How many VC negotiation rounds did your firm engage in during the past 3 years?	Scalar variable
		How many acceptable deals resulted from all of these negation rounds?	Scalar variable

A final success rate is established by dividing the number of acceptable deals by the number of negotiation rounds. The resulting theoretical scale is a ratio scale, but note that the indicator can only exceed 1 when on average, more than one acceptable deal was offered per negotiation round.

H-D$_{10}$ Experience with VC investment (+)

This question was only measured as a perception indicator, and thus there are no actual behavior or behavioral outcomes measured.

3.5 Validity and Reliability

Next, the validity and reliability of the methodological approach will be addressed.

3.5.1 Reliability

The questionnaires have been standardized and made available via the internet and thus all respondents in one subgroup fill in identical questionnaires (see appendices A and B). The questionnaire was finalized after 6 (3 at VCs, 3 at NTBFs) pilot interviews to ensure that the questions are interpreted unambiguously by all respondents. This improves the reliability of the findings.

Siegel et al. (1988) report methodological problems with self-rating and asking VCs (corporate venture capitalists in their case) to rate their own performance. These self-rating problems are also likely to occur with NTBFs. The researcher is aware of these problems associated with self-reporting and the social desirability of certain answers and has devoted extra attention to the operationalization phase to avoid these specific measurement challenges. Successively improved sets of question sets have been tested during the preliminary qualitative pilot interviews to arrive at more reliable indicators. The first respondents were revisited with the final questionnaire to make sure that their responses are altered accordingly when the questions or the possible answers in the final questionnaire are different than the original questions.

3.5.2 Internal validity

The extent to which the environment can impact the results of the research is significant because there can be no experimental setup or control group, as is often the case within the social sciences (Babbie, 2007). However, the majority of proposed hypotheses is based on previous quantitative inquiry. This provides the results with an empirical foundation. The use of two distinct indicator types to validate hypothesized effects further adds to the internal validity of the study.

3.5.3 External validity

The research focusses on The Netherlands because the problems of the Dutch venture capital industry have large prevalence in Europe. Due to the time constraints of this study, the research does not include multiple institutional environments. The findings of this study thus only apply to the Netherlands and are only indicative of major issues in continental Europe.

The very limited sample size of the VCs provides an additional challenge for the domestic generalizability of the results. Compounding this challenge is the domestically oriented nature of the VC sample. Therefore, it needs to be emphasized that the results of this research are only applicable to the sample and should only be seen as indicative of the population with the greatest caution.

The relative response of NTBFs was very low compared to the population of NTBFs. As indicated before, the actual population of NTBFs that considered venture capital might be smaller than the Chamber of Commerce export, increasing the response rate relative to a relevant population by an unknown amount. However, it should be noted that the relative small sample size indicates that biases in the sample might have occurred, even though it was not possible to identify those due to the limited nature of the chamber of commerce sample. This means that the results of the NTBFs also need to be interpreted with great care based on the realization that the sample of NTBFs might differ from the population of Dutch NTBFs, even if no conclusive proof for the latter could be found in the samples' characteristics.

3.6 Hypothesis testing

For every hypothesis, the measurement model includes two distinct types of indicators for each independent concept. The first type relates to perceived motivation or ability of an actor. The second indicator type concerns the actors' actual behavior performed in the past, which can either be actual behavior or an outcome of that behavior in terms of portfolio or capital structure characteristics. To match the time-frames of both types of indicators, the perception questions asked for the perception of the respondents three years prior to the questionnaire[7].

Every hypothesis is tested based on both types of indicators of the independent variable discerned, which leads to two results for each hypothesis. This method of hypothesis testing is based on the premise that the validity of each hypothesis increases when the behavioral indicator of the actor and their stated perception have the same effects on the dependent variable. In other words, both the perception and the behavior performed should be congruent with a respondents' response towards a particular motivation or ability to provide or accept early stage venture capital investment. For that purpose, the congruence of the estimated effects of the perception and past behavior on the dependent variable will be investigated for every hypothesis.
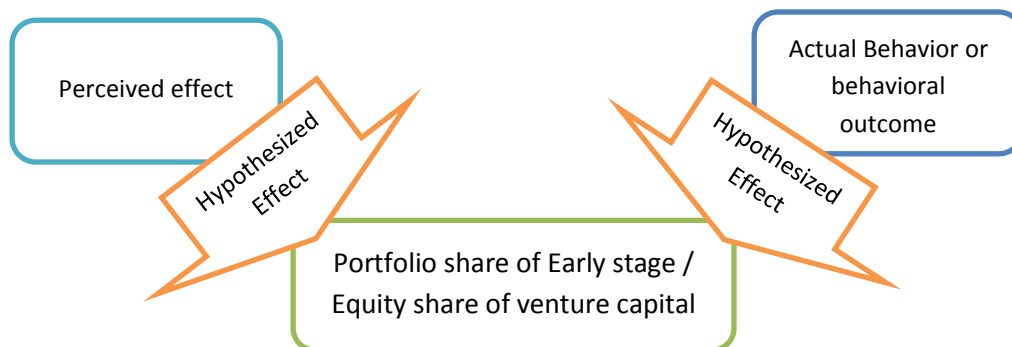
Figure 3: relationship of the two indicator types with motivation or ability hypothesis.

Figure 3 shows that both types of indicators (perception indicator and behavioral outcome indicator) should covariate in the same way with the dependent variable in order to most reliably reflect the hypothesized effect. In this research it is presumed that there is sufficient ground to reject the hypothesis when either both indicator types result in a contradictory hypothesized effect or when one estimated effect is contradictory to the hypothesized effect and the other one is inconclusive or not supporting the hypothesized effect. Additionally, respondents across the categories of the dependent variable might agree that a hypothesized effect is of limited magnitude and importance. In that case, it might be concluded that it is unlikely that the hypothesized effect is of great importance regarding the investment provision or acceptance decision of the VC or NTBF.

In the cases where both indicator types of an independent concept are not congruent regarding their indication of the hypothesized effect, potential sources of bias will be evaluated before the validity of the hypothesis will be assessed. Incongruence could be the result of imperfect operationalization of the independent concepts or of measurement problems with the indicators, and these potential problems must be addressed before interpreting any incongruence between the two indicator types as more than a result of biases.

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[7] A timespan of three years is chosen because three years is the most often mentioned strategic timespan by SMEs (Stonehouse and Pemberton, 2000).

3.7 Venture Capitalist data

Small Sample Issues

Critique could arise regarding the treatment of average values for non-robust scales. For instance, the Likert scales are ordinal measures for which the non-robust averages used are not suited, since this assumes that the Likert measure has equidistances between the scores. This is a consequence of operationalization decisions and impacts the instrumental validity of the research. However, as Gaito (1980) convincingly argued, there is no statistical basis to reject the calculation. It would be preferable to use robust statistics on the data, but within the different categories (such as early stage VCs) the sample size is too small (n=2) to use a robust statistic like the median or mode.

Non-parametric statistical testing is allowed on small sample data (c.f. Norman, 2010), but this research will not conduct these statistical tests because of the generalizability they might imply. The research instead uses descriptive statistics that stay very close to the original data.

Associations of independent variables

Before the indicators are each assessed in their own right, it is essential to compare the interrelatedness of the various indicators to validate if it is correct to even analyze them independently. The Kendall's' Tau B measures of association (Kendall, 1976) show that the data collected of the sample of Venture Capitalists contains three pairs of independent variables that show an association coefficient higher than 0.75 and consequently should not be conceived as independent from one another (see Appendix C).

The first pair is the perceived return/risk ratio and the match of deal size with the fund size. To understand why these two variables are likely to be very related, one should consider a scenario in which the match of deal size with fund size is not present. When a business proposal requires an investment larger than the preferred size of the investor, the risk perception will increase since the fund is stretching its resources and cannot diversify away the risk as much as they would like. The contrasting case, in which a fund is investing in a very small deal, will influence the return perception since the *absolute* return might be lower than the numbers the fund is comfortable with.

The second pair is the experience with the sector of a portfolio company and the experience with the development stage of a portfolio company. It is likely that these two are related as well; since both are measures of specialization (geographical orientation is sometimes also taken into account as specialization measure, c.f. Knill, 2009). The research will focus on sector specialization because it is less closely related to the dependent variable and therefore less susceptible to contamination of definitions of concepts.

In the association analysis table a third relationship can be found between two sub-dimensions of the quality of the proposal, which are the quality of the management team behind a proposal and the quality of the financials. These sub-levels of quality are not directly related to hypothesized effects and thus do not impact the results directly. However, when examining this data later on, the quality of the financials is chosen as the primary independent variable since it is more directly related to the quality of a proposal. Also, VCs mentioned during the interviews that management teams could be supported by VC appointed C-level officers when the quality of the management was low, which decreases importance of management teams as a dimension of the quality of a business proposal.

3.8 New Technology Based Firm data analysis

Method of data analysis

The sample of NTBFs consists out of 36 respondents. The data gathered amongst these respondents is used to statistically test the hypotheses. Because there is only one dependent variable (namely the dichotomized equity share of venture capital), the hypotheses can be tested using an Ordinary Least Squares (OLS) approach. The OLS method assumes that all dependent, independent and control variables are measured on ratio or interval scales. However, most variables were measured on ordinal scales and some as dichotomous variables. To enable an OLS approach, the correlation coefficients of non-observed, continuous, standardized and normally distributed variables underlying the measured dichotomous and ordinal variables are estimated. This is done in 3 different ways. For pairs of dichotomous and ordinal variables, polychoric correlations are used (Olsson, 1979), for pairs of dichotomous or ordinal variables with continuous variables a polyserial correlation is used (Olsson et al., 1982), and for pairs of continuous variables Pearson correlations are used (Wonnacott & Wonnacott, 1991). The resulting correlation coefficients are placed in a correlation matrix, and then an Ordinary Least Squares regression is conducted with a maximum likelihood method.

Three separate regression models will be constructed: One based exclusively on the control variables, one based on the perception indicators and the control variables and one based on the actual behavior indicators and the control variables. Because all hypothesized effects are specified to have either positive or negative effects, the p-values are calculated on the basis of one-tailed tests.

Correlation of independent variables

An important criterion for the regression analysis is independence of the independent variables to prevent the effects of multicollinearity. The correlation analysis of the independent variables shows that all variables can be interpreted as independent from other independent variables (Appendix D and Appendix E) because the correlations do not exceed 0.89 (i.e. variance inflation factor <4 (see O'Brien, 2007)).

The most notable correlation amongst the perception indicators is the correlation between fear for stigmatization after failure and the fear for the effects of bankruptcy (r: 0.685). The relationship between both indicators is not surprising, as both indicators can be related to the underlying concept of fear of the effects of business failure. However, the correlation does not exceed 0.89 so the indicators can still be considered independent from another.

The most notable correlation in the set of behavior indicators is the correlation between the behavioral indicator of substitution and the behavioral indicator of a lack of VCs (r: 0.698). An explanation could be found in the underlying notion of search intensity. When the availability of substitutes is higher, NTBFs are less inclined to investigate the VC market and consequently meet less VCs (the behavioral indicator of this variable). Conversely, a perceived lack of VCs could also force an NTBF to pursue regular means of financing with more vigor.

Control variables

In section 2.5.2, four different control variables were introduced for the NTBFs. However, a correlation analysis of the control variables indicated a high degree of correlation between the development stage of the firm and the annual revenues of the firm ($r = 0.922$ and VIF > 4). Thus, the variables cannot be seen as independent and only one of these variables is included. The correlation is not surprising since the categories for the indicator of development stage were based on commercial performance (the categories being: no revenue, first revenue, first profits, sustainable profits). Additionally, it is likely that unviable firms do not develop (or survive) into the later stages.

Of these two correlated control variables, the development stage is considered to be more related to the investment decision as it affects the growth opportunities perceived by the VC and relates directly to the need of VC involvement to achieve further growth for the NTBF. Additionally, if a firm already has very stable profits (measured more directly by the development stage), growth capital can likely be found via regular means, and VC funding becomes superfluous.

4. Results

The following section will describe the results of the analyses conducted on the data, first for VCs and thereafter for NTBFs. Since the VC analysis is based on descriptive results, the results require a more elaborate interpretation than for NTBFs, where a regression analysis is used.

4.1 Venture Capitalist

4.1.1 Hypothesis testing

H-S$_1$ Return-risk ratio (+)

Table 25: Weighted Perception indicator for return/risk ratio per stage focus
(scale 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of return/risk considerations as a stimulus for early stage investment	-0.33	0.00	-0.25

Table 25 shows that there is no evident trend in the return/risk evaluation for the different categories of VCs. Overall, all VCs seem more hindered than stimulated by the return/risk prospects of early stage investments. The perception indicators do not support the hypothesized effect of higher return risk ratios inducing VCs to invest more in early stage investments.

Table 26: Actual behavior indicators for return-risk ratio per stage focus (Ratio scale)

Indicator	Late stage	Hybrid	Early stage
Return/risk ratio on early stage portfolio	-	0.31	0.85
Return/risk ratio on late stage portfolio	1.54	1.71	-

Venture Capitalists can only accurately determine the return on an investment after an exit has taken place. VCs do attempt to approximate their portfolio's value during the lifetimes of the investments with so called Fair Market Valuations (FMVs). However, none of the early stage venture capitalists in the sample had issued an FMV on their portfolio yet, and consequently they were not able to provide information on their current return. Therefore, for the early stage portfolio, a return/risk estimation is calculated using the FMV of hybrid firms on their early stage portfolios. Thus, the higher return/risk ratio in table 26 for early stage VCs in early stage investments only reflects a lower risk rate for early stage VCs (because the FMV used is the same for both investor types).

The actual behavior indicators show that the return risk ratio on late stage portfolios is better than the ratio on the early stage portfolio of the hybrid firm. This data contradicts the hypothesis that early stage specialized firms increase early stage portfolio shares because of the higher return/risk ratios.

The numbers on the actual return/risk ratios clearly contradict the hypothesized effect, and even indicate that the hypothesis might operate in the reverse direction of what was originally expected. For the 12 VCs in the sample, the low return/risk ratio of early stage investments appears to be a barrier for early stage investment rather than a stimulus. In sum, there is no support for the hypothesized positive impact of return/risk ratios on the portfolio share of early stage venture capital. A negative effect seems more likely.

H-S₂ Reputational hazard (-)

Table 27: Perception indicator for reputational hazard of early stage investment per stage focus
(4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of reputational hazard as a barrier to early stage investment	0.67	0.00	-1.00

Table 27 shows a clear trend that the more involved a venture capitalist is with early stage investments, the smaller the weighted impact of reputational hazard is a barrier to early stage investment. The perception indicators thus seem to support the fact that late stage focused VCs stay away from early stage deals because of potential negative consequences for their reputation.

Table 28: actual behavior indicators for reputational hazard of early stage investment per stage focus

Indicator	Late stage	Hybrid	Early stage
Portion of early stage proposals rejected due to reputational hazard	- [8]	5%	0%
Media frequency of early stage compared to later stage *(scale -2 = late stage is more frequent, 2 = early stage is more frequent)*	-0.4	-0.5	-1.0
Importance of early stage compared to later stage to investors *(scale -2 = late stage is more important, 2 = early stage is more important)*	-1.2	-1.8	-0.5

Hybrid firms reject early stage business proposals on the grounds of reputation more often than early stage VCs, but the share within total rejections is still small (5%). Also, all VC firms agree on average that later stages investment are more important to their fund providers than early stage investment opportunities and that the media give more attention to later stage rather than early stage investment deals. However, the questionnaire did not include questions on late stage rejection on the basis of reputational hazard, and therefore the behavioral indicators for this hypothesis have become fuzzy. The results for the actual behavior indicators therefore remain inconclusive.

The perception indicator shows that late stage specialized VCs on average agree that reputation is a barrier for provision of early stage capital. This is not unambiguously supported by the actual behavior indicators, but because of the measurement problems reported, these actual behavior indicators should not substantiate the rejection of the hypothesis either. The supporting evidence derived from the perception indicators leads this research to maintain that reputational hazard negatively impacts the share of early stage investments in the portfolios of the VCs in the sample.

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[8] This indicator was not included in the questionnaire, since late stage venture capitalists reject early stage proposals on the ground of stage focus, not on grounds of reputational hazard.

H-S₃ Shortage of capital (-)

Table 29: Perception indicator shortage of capital per stage focus.

(4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of a lack of capital as a barrier to early stage investment	0.50	-1.00	-1.00

The weighted perception indicator shows that late stage focused venture capitalists agree that a shortage of available capital is a barrier for early stage investment, whereas hybrid or early stage VCs do not. However, a clear trend is absent and therefore, the perception indicator does not support the hypothesis that a lack of capital bars VCs out of early stage investments.

Table 30: Actual behavior indicators shortage of capital per stage focus.

Indicator	Late stage	Hybrid	Early stage
Importance of institutional investors *(scale 3 = only top 3, to -3 = only bottom 3*	0.2	-1.0	0.0
Destination of new capital *(scale 1 = only late stage, 11 = only early stage)*	1.3	3.3	10.0

The behavior indicators show that there are no major differences in institutional investor involvement across the early stage involvement of VCs, as such, prudent man behavior of institutional fund providers is not apparent in the sample. The destination of new capital does show a clear trend, but this is because all venture capitalists would stay very close to their existing portfolios. Thus, when presented with freely available capital, late stage VCs would not invest this in early stage opportunities. This is also clearly incongruent with the hypothesized negative effect of capital shortage on early stage investments by late stage VCs.

Since neither of the two types of indicators supports the hypothesis, the hypothesized effect is considered not to be present in the dataset.

H-S₄ Competition with public venture capitalists (-)

Table 31: Perception indicator for competition with public VCs per stage focus.

(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of competition with public VCs as a barrier to early stage investment	-1.17	-0.56	-2.00

The perception indicator shows that, on average, VCs do not experience public venture capitalists as a barrier. Early stage firms disagree most with the barrier effect of public VCs, but there is no evident trend related to early stage involvement. The results of the perception indicator therefore provide no support for the hypothesized negative effect of public VCs on early stage capital provision.

Table 32: Actual behavior indicators for competition with public VCs per stage focus.

(Scale: -3 = very positive impact, 0 = no effect 7, very negative impact)

Indicator	Late stage	Hybrid	Early stage
Weighted negative impact of public VCs	0.6	0.92	0

The behavior indicator paints a picture similar to the perception indicator. Overall, the weighted negative impact of public VCs is low, and the VCs do not seem to experience a negative impact of public VCs. The data does not warrant conclusions across the investment phases, but it does appear that by the 12 VCs in the sample, public VCs are not experienced as a major factor in the investment decision of private VCs. The hypothesis is not supported by the data, but additionally this research contends that the impact of public VCs in the early stage investment decision is limited since both indicators show a uniform picture of irrelevance.

H-S5 Syndication opportunities (+)

Table 33: Actual behavior indicator of syndication opportunities per stage focus.

(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of syndication opportunities as a stimulus to early stage investment	0.17	0.25	-0.75

The perception indicators do not suggest that early stage VCs agree that syndication opportunities motivate them to invest into early stage business proposals, and no convincing trend can be identified in the data. The deviations from 0 are small, showing no clear support for the hypothesized effect of syndication opportunities on the provision of early stage venture capital by VCs.

Table 34: Actual behavior indicator for syndication opportunities investors per stage focus.

(Scale: -30 % till 130 %, see the operationalization section 3.3.1: H-S5)

Indicator	Late stage	Hybrid	Early stage
Net desired syndication frequency	61.7%	30.0%	65.0%

The two actual behavior indicators are combined to record the actual desired share of deals in which the VCs would like to have other VCs present as a co-investor. The data indicates that early stage VCs are not more inclined to co-invest with other VCs then late stage investors, providing no support for the hypothesized positive effect of syndication on the provision of early stage venture capital by VCs.

The data from both indicator types shows no support for the hypothesis. Therefore, the hypothesized effect is considered not supported by the data.

H-S6 Quality of business proposals (+)

Table 35: Perception indicator for the quality of business proposals per stage focus.

(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of quality of business proposals as a stimulus for early stage investment	-1.17	-0.56	-2.00

The hypothesized effect would be supported when early stage focused venture capitalists would agree with the statement that the quality of early stage business proposals motivates them to invest into early stage portfolio firms. But as Table 35 shows, this is not the case. All three types of investors disagree with the statement, early stage firms the most. There is no trend observable across early stage involvement of VCs. The perception indicator thus does not support the hypothesized positive effect of the quality of business proposals on a VCs' portfolio share of early stage.

Because the quality of a business proposal is a multi-faceted concept, the questionnaire also recorded the effects of several aspects of business proposal quality on early stage investment motivation (as perception indicators), the results are presented in table 36.

Table 36: Stimulus of several quality aspects on the motivation to invest in early stage deals
(scale: -2= strong disagreement, 2 = strong agreement)

Concept	Dimension	Measure	LS	Hyb	ES
Quality	Product or service knowledge	5-point likert scale (strongly agree (1), agree (2), no opinion or N/A (3), disagree (4), strongly disagree(5))	0.3	0.2	0.8
	Management		-0.3	0.0	-0.3
	Market knowledge		-0.1	0.2	-0.3
	Financials		-0.3	-0.2	-0.3

None of the aspects of a business proposals' quality shows a clear trend across the different development stage foci of the VCs. Thus, a division of the hypothesized effect into effects of different quality aspects does not provide support for the quality hypothesis at a lower conceptual level.

Table 37: Actual behavior indicator for the quality of business proposals per stage focus.
(Scale: ratio scale, see operationalization section 3.3.1 H-S_6) [9]

Indicator	Late stage	Hybrid	Early stage
Weighted retention rate per evaluation stage	-	-14.2%	-16.0%

Late stage oriented venture capitalists were not included as a respondent group for this indicator, since they do not evaluate the quality of early stage business proposals as rigorously as early stage focused VCs. For hybrid and early stage venture capitalists, the negative weighted retention rates show that overall, business proposals get rejected in early phases rather than later phases. The difference between hybrid firms and early stage firms is very small and should not be interpreted as a trend. The actual behavior indicator is thus not supportive of the hypothesis.

Both indicator types do not provide supporting data for the hypothesis, and therefore the hypothesized effect is deemed not supported by the data of the VC sample.

H-S_7 Number of business proposals (+)

Table 38: Perception indicator for the number of business proposals per stage focus.
(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of quantity of business proposals as a stimulus for early stage investment	0.83	1.50	0.75

Table 38 shows that VCs across all stage foci agree that the quantity of early stage business proposals they receive was a stimulus for more early stage investment. However, there is no clear trend between the different investment categories of venture capitalists, and thus the perception indicators do not support the hypothesized effect that the quantity of business proposals increased early stage portfolio shares. However, the effect of the quantity of the late stage deal flow was not measured, which limits the ability to discern an isolated effect of the number of early stage proposals. Therefore, the result of this indicator is considered inconclusive.

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[9] A move towards (51%;50%;49% → higher early retention) would result in a positive score, a move towards (49%;50%;51% → lower early retention) in retention rates would get a negative score.

Table 39: Actual behavior indicator for the number of business proposals per stage focus.

Indicator	Late stage	Hybrid	Early stage
Share of early stage proposals in the total deal flow	23.61% *(85 out of 360)*	57.14% *(500 out of 875)*	75.00% *(300 out of 400)*

The share of early stage deals in the total deal flow for the venture capitalists of different categories shows a clear relationship with the extent of early stage involvement and the portion of early stage proposals. This supports the hypothesized effect wherein the number of potential early stage deals motivated venture capitalists to invest in early stage business proposals.

The perception indicator is inconclusive with regard to showing differences across the investor groups. However, all investors admit that the number of early stage business proposals slightly motivates them to invest more in early stage business proposals. Together with the actual behavior indicators' observation that, in the sample, the portion of early stage business proposals in the deal flow of the early stage focused VCs is indeed much higher, there is weak support for the positive effect of number of deals on the early stage capital provision of VCs.

H-S$_8$ Geographical distance (-)

Table 40: Perception indicator for the geographical distance to portfolio firms per stage focus.
(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of quantity of geographical distance as a barrier to early stage investment	-0,17	-0,33	-0,50

The perception indicator shows that, on average, none of the VC categories agrees with the fact that geographical distance is a barrier to early stage investment. The perception indicators show a trend across the VC categories, but do not directly support the hypothesized effect, since no VC category actually agrees that it is a barrier. Staying on the safe side, the perception indicator is considered not supporting the hypothesized negative effect of travel time on portfolio share of early stage.

Table 41: Actual behavior indicator for the geographical distance to portfolio firms per stage focus

Indicator	Late stage	Hybrid	Early stage
Average distance *Scale: in minutes (0-10(1), 11-30(2), 31-60(3), 61–120(4) and >121 (5)*	3,0	3,5	4,5
Number of visits *Scale: once(1) , twice(2), three times(3), four times(4), >four times (5)*	1,2	1,8	3,5
Management involvement *Scale: Hands-off(1), Laissez-faire(2), Balanced(3), Close Tracking(4), Co-management(5)*	2,7	3,3	3,5

Table 41 displays three clear trends of increasing travel time, more visits per month and an intensified management involvement with increasing early stage involvement of VCs. The data indicates that early stage VCs are involved more intensively with portfolio firms that are further away. As a consequence, they are expected to spend more time travelling to their portfolio firms than later stage oriented VCs. This indicator therefore supports the hypothesized effect.

Since the perception indicator does not support the effect, but the actual behavior indicator does, the hypothesized negative effect of travel time is regarded to be weakly supported by the data.

H-S₉ National legislation and foreign investment (-)

Table 42: Perception indicator for differences in national legislation per stage focus.
(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of difference in national legislation as a barrier to early stage investment	-0.17	-0.17	0.00

The perception indicator shows that VCs in the different categories are mostly indifferent towards the hypothesized effect wherein national legislations are a barrier for international early stage investment, and no trend is discernible. The perception indicator does not support the hypothesis.

Table 43: Actual behavior indicator for the geographical distance to portfolio firms per stage focus
(Scale 0 = no difficulty with international investment time; 200 % = most difficulty with international investment)

Indicator	Late stage	Hybrid	Early stage
Net barrier for international investment	114.2%	107.5%	130.0%

Both indicator types show similar results, since the scores of the actual behavior indicator again do not differ much across the investment categories. Looking at the data of the original two indicators, the actual international investment levels are quite low (1-15%), but when VCs do invest internationally, they frequently cooperate with local partners in the foreign country (15-45%). This is the case for all investors and does not distinctly differ for early stage oriented VCs.

Difficulties in investing abroad do not appear significant as there is no reported relationship between the perceived difficulty of investing or the actual barriers to investing internationally and early stage investments. The hypothesized effect is therefore considered not to be supported by the data. Though every result should be interpreted with caution due to the small sample size, the sample has been shown to be more domestically oriented than the population. Therefore it should be noted that the indifference towards international investment in particular could be different in the population

H-S₁₀ Referrals and recommendations by intermediaries (+)

Table 44: Perception indicator referrals and recommendations per stage focus.
(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of referrals and recommendations as a motivation for early stage investment	-0.33	0.38	-0.25

Hybrid VCs agree on the positive effect of intermediation, whilst early and late stage VCs disagree that intermediation has a positive effect on early stage investments. The perception indicator would support the hypothetical effect of intermediation on early stage investments only if the weighted effect of intermediation would increase with early stage involvement. However, the data shows no such trend, and therefore the hypothetical effect is not supported by the perception indicator.

Table 45: Actual behavior indicator for referrals and recommendations per stage focus
(Scale 0 =no intermediation; 200 % = maximum intermediation (all acquired deals are recommended))

Indicator	Late stage	Hybrid	Early stage
Net acquisitions via intermediation	78.33%	70.00%	90.00%

The actual behavior indicator also does not support the hypothesized effect. The actual intermediation frequency is highest in the early stage tier of the VC market, but the expected decreasing intermediation effect with a declining early stage portfolio share is absent.

Neither indicator type supports the hypothesized effect of intermediation on early stage portfolio share. Therefore the hypothesis is considered not supported by the data.

H-S$_{11}$ and H-S$_{12}$ Sector and stage experience (+)

As stated in section 3.7, the association between the perception indicators of HS$_{11}$ and H-S$_{12}$ (sector and development stage experience) is too large and does not allow the indicators to be considered as independent from each other. Experience with the sector is chosen as the primary independent variable, but it is beneficial to keep in mind that the two hypotheses likely relate to specialization.

Table 46: Perception indicator for experience with a portfolio companies' sector per stage focus.
(Scale: 4 = strong agreement, -4 is strong disagreement)

Indicator	Late stage	Hybrid	Early stage
Weighted effect of sector experience as a motivation for early stage investment	0.17	0.75	2.00

As table 46 shows, there is an increase of agreement with the statement (that experience is a motivation to early stage venture capital investment) as the early stage involvement of the VCs increases. This indicates that early stage firms are indeed motivated to invest more into early stage firms because of their experience within sectors of portfolio firms more than their late stage counterparts. The perception indicator supports the hypothesized positive effect of sector experience on the provision of early stage venture capital.

Table 47: Actual behavior indicator for effect sector experience per stage focus
(Scale: 0 (lowest sector experience) to 1 (highest sector experience)

Indicator	Late stage	Hybrid	Early stage
Net effect of sector experience	0,07	0,04	0,14

As table 47 shows, there is no obvious trend in sector experience across investment stages. This indicates that early stage oriented VCs do not have more actual experience with in their sector than late stage investors. The actual behavior indicator does not support the hypothesized effect.

Only the perception indicator backs the hypothesized effect of sector specialization on portfolio share of early stage, leading the research to conclude that the hypothesized effect of sector specialization is weakly supported by the data. The cause of the incongruence between the indicators is most likely attributable to the measurement, as many late stage VCs invested in not listed non-high-tech sectors and made frequent use of the 'other' field, causing a distorted sector focus.

H-S$_{13}$ Match of fund size with deal size (+)

As stated in section 3.7, the association of the match of fund size with deal size indicator with the return/risk indicator (H-S$_1$) was too large to justify treating the match of deal size with preferred deal size as an independent variable. Therefore, no results are presented for this hypothesized effect.

4.1.2 Summary

As stated in section 2.6, when actual behavior indicators and perception indicators are in agreement, the validity of the hypothesis testing increases. Table 48 reviews the support per hypothesis for both sets of indicators which can be *support*, *inconclusive*, *no support* or *contradictory*. This can yield a number of conclusions: *support for the hypothesis*, *weak support for the hypothesis* or *no support*.

Table 48: Overview of hypothesis testing

Hypothesis	Perception	Actual behavior	Conclusion
H-S$_1$ Return-risk ratio (+)	No support	Contradictory	No support for Hypothesis
H-S$_2$ Reputational hazard (-)	Support	Inconclusive	**Weak support for hypothesis**
H-S$_3$ Shortage of capital (-)	Support	Contradictory	No support for hypothesis
H-S$_4$ Competition with public VCs (-)	No support	No support	No support for hypothesis
H-S$_5$ Syndication opportunities (+)	No support	No support	No support for hypothesis
H-S$_6$ Quality of business proposals (+)	No support	No support	No support for hypothesis
H-S$_7$ Number of business proposals(+)	Inconclusive	Support	**Weak support for hypothesis**
H-S$_8$ Geographical distance (-)	No support	Support	**Weak support for hypothesis**
H-S$_9$ National legislation / foreign investment (-)	No support	No support	No support for hypothesis
H-S$_{10}$ Referrals / recommendations by intermediaries (+)	No support	No support	No support for hypothesis
H-S$_{11}$ Sector experience (+)	No support	Support	**Weak support for hypothesis**
H-S$_{12}$ Development stage experience (+)	*Independent variable was not independent from H-S11*		
H-S$_{13}$ Match fund size with deal size (+)	*Independent variable was not independent from H-S1*		

These results will be combined and further interpreted in chapter 5.

4.1.3 Control Variables

The following paragraphs will check the effect of the control variables on the hypothesized effects that have been supported by the data of the VCs (see table 48). Control variables were only present for two effects which were found to weakly supported by the data, namely H-S_8 (geographical location) and H-S_{11} (fund age).

H-S_8 Geographical distance and geographical location

The hypothesized effect of geographical distance is supported by the actual behavior indicators. But as section 2.5.1 states, longer net travel times might be the result of a non-central location of the Venture Capitalist, instead of reflecting a trend across different investment stages.

The VCs geographical location is thus used to construct a location indicator. For this indicator, the distance to the center of the Randstad (Alphen A/D Rijn), the main conurbation of The Netherlands, is calculated using Google Maps as routing tool. The result is based on the quickest route in minutes, not the shortest in kilometers. Note that a key assumption for this analysis is that portfolio firms are distributed randomly over the Randstad or in a radial fashion outside of this area with Alphen A/D Rijn as a center.

Then, a Kendall's Tau B rank correlation analysis is conducted with the travel time (in minutes) to the center of the Randstad as an explanatory variable for the reported average travel time to portfolio firms. Table 49 reviews the results of this analysis.

Table 49: Kendall Tau B rank correlation analysis on travel minute categories and travel time to Alphen A/D Rijn.

Kendall's tau_b		Minutes to Alphen A/D Rijn
Travel minute categories	Correlation Coefficient	- 0.228
	Sig. (2-tailed)	0.350
	N	12

As the correlation analysis indicates, there is no significant relationship, nor does the assumed relationship operate in the expected direction (increased travel time to Alphen A/D Rijn should increase the average travel time category to portfolio firms).

Controlling for the variable of geographical location does not account for differences in reported travel time, and thus, the differences in net travel time are assumed to relate to portfolio characteristics, and not to the control variable of geographical centrality of the Venture Capitalist.

H-S₁₁ Sector experience and fund age

The hypothesized relation between sector experience and the ability to invest in early stage may not be related to the nature of the different venture capital markets, but instead be the result of the age of the VC fund. If the VC's operation is older, it has likely accumulated more sector experience to draw from. Because the total age is most relevant to this total accumulation of experience, the start year of the oldest fund will be indicative of the fund age (and not, for example, the average age of all different funds within one VC firm).

Because the hypothesized effect is supported by the perception indicator, that indicator is included in a Kendall's' tau b rank correlation analysis with fund age as the suspected independent variable causing higher sector experience scores on the perception indicator for sector experience.

Table 50: Rank correlation analysis fund age as a cause for the effect of sector experience

Kendall's tau_b		Age of the fund in years
Perception indicator of sector experience	Correlation Coefficient	-0.149
	Sig. (2-tailed)	0.591
	N	9

Table 50 shows that there is no significant relationship between the age of the fund in years and the weighted perception of the effect of sector specific knowledge. In other words, the data of the sample does not support the notion that more seasoned VCs are in their perception more driven by their experience to invest into early stage businesses than less experienced VCs. Based on this result, the potential relationship of the control variable on the independent variable can be dismissed for the collected data.

4.2 New Technology Based Firm

Table 51 presents the statistical results for all three regression models that were outlined in section 3.8.

Table 51: Overview of regression model coefficients with flagged p-values

Maximum likelihood regression models				
Control variables		**Model 1**	**Model2**	**Model 3**
	C Age	-0.041	0.061	-0.221***
	C Development stage	-0.388**	-0.335**	-0.608***
	CIPR	0.020	0.088	0.474***
Independent Variables		**Model 1**	**Model2**	**Model 3**
Perception indicators	Substitute	-	-0.252*	-
	Regain Control	-	0.182	-
	VC Added Value	-	-0.152	-
	Fear of Stigmas	-	0.353**	-
	Bankruptcy	-	-0.335**	-
	Local Involvement	-	-0.186*	-
	Referral	-	-0.171	-
	VC Lack	-	-0.186	-
	Deal-match	-	0.393**	-
	Experience	-	0.278**	-
Actual behavior indicators		**Model 1**	**Model2**	**Model 3**
	B substitute	-	-	-0.109***
	B regain Control	-	-	0.483***
	B VC Added Value	-	-	-1.530***
	B Fear of Stigmas	-	-	-0.278***
	B bankruptcy	-	-	0.256***
	B Local Involvement	-	-	-0.361***
	B Referral	-	-	-0.028**
	B VC Lack	-	-	0.968***
	B Deal match	-	-	1.418***
Goodness of fit		**Model 1**	**Model2**	**Model 3**
	R^2	16,40%	70,10%	99,80%
	Adjusted R^2	6.75%	45,81%	99,66%
	F-value	1.70	2.89	706.92

b) * indicates variable is significant at the 0,10 level
c) ** indicates variable is significant at the 0,05 level
d) *** indicates variable is significant at the 0,01 level

Table 51 shows an increased goodness of fit (F-value) after the addition of the independent variables, indicating that the conceptual model explains the observations better than only control variables.

The results presented in table 51 are combined at hypothesis level by comparing the perception indicator results with the actual behavior indicator results. Table 52 presents these combinations in a summary of the direction and significance of the indicators for the hypotheses in the regression models.

When the indicators in both models in terms of preferences or actual behavior relate to the dependent variable in a statistically significant way and in the expected direction (when the signs are identical) then the hypothesis is considered to be supported by the data. If both indicators relate to the dependent variable in the expected direction but only one is significant, the hypothesis is weakly supported. When indicators contradict each other the verdict is inconclusive, and when both indicators (of which at least one significantly) contradict the hypothesized effect there is no support for the hypothesis but a suggestion of a reverse relationship, these will be discussed later in further details. These combinations of indicators are presented in the conclusion column in table 52.

Table 52: Quick summary of regression results for both indicator types for each individual hypothesis

Hypothesis	Perception	Actual behavior	Conclusion
H-D$_1$ Availability of substitutes (-)	Significantly negative	Significantly negative	**Support for hypothesis**
H-D$_2$ Retaining and regaining control (+)	Positive	Significant positive	**Weak support for hypothesis**
H-D$_3$ Added value by venture capitalist (+)	Negative	Significantly negative	No support for hypothesis
H-D$_4$ Fear of social stigmatization after business failure (-)	Significantly positive	Significantly negative	Inconclusive
H-D$_5$ Legal effects of bankruptcy (-)	Significantly negative	Significantly positive	Inconclusive
H-D$_6$ Lack of VC local involvement (-)	Significantly negative	Significantly negative	**Support for hypothesis**
H-D$_7$ Intermediation by third parties (+)	Negative	Significantly negative	No support for hypothesis
H-D$_8$ Lack of venture capital funding (-)	Positive	Significantly negative	Inconclusive
H-D$_9$ Match in deal valuation (+)	Significant positive	Significant positive	**Support for hypothesis**
H-D$_{10}$ Experience with VC investment (+)	Significant positive	*Indicator was not present*	**Weak support for hypothesis**

The negative effects of the availability of substitutes and the lack of local involvement of VCs and the positive effect of a match in deal valuation are supported by the data. The positive effects of experience with VC investment and the ability to retain or regain control are weakly supported.

Three hypothesized effects could not be conclusively found in the data and need to be further investigated before their effects can be properly ascertained. The incongruence of the effects of both indicators could relate to measurement problems with the indicators. A first potential problem is that the indicator that was intended was not adequately reflected by the behavioral indicator that was measured. The second potential problem is that the question stated led the respondents to interpret the causality of an indicator differently. For instance, where an indicator intends to measure the non-acceptance of venture capital funding due to social stigmas, respondents might have interpreted that increased social stigmas result from the acceptance of venture capital funding, by which the sign of the measured effect becomes reversed.

Because this research set out to test the hypotheses with a positive or negative hypothesized effect, there were no indicators constructed for identifying relationships that were contradictory to was what originally expected. In other words, the data does not allow to determine conclusively that there is a negative effect of the expected added value by the VC, the research must instead conclude

that there is no support for these hypotheses. The results suggest, however, that both the value added by the VC and the intermediation by third parties have a negative effect on the equity share of venture capital instead of the expected positive effect.

The negative and significant relationships of the CDevelopmentStage control variable shows that NTBFs are more drawn to accept venture capital funding when they are in earlier stages of development. This relationship is in the top four of coefficients in both the perception and actual behavior regression models (table 51), indicating it is an important condition for the acceptance of venture capital. It shows that NTBFs should be introduced to potential VCs early in their development to maximize their likelihood of accepting venture capital funding.

The results of the descriptive analysis conducted for VCs and the statistical analyses conducted for the NTBFs will now be synthesized in three sections, namely implications for theory, managerial implications for NTBFs and VCs and implications for policymakers. Afterwards, the limitations of this research will be reviewed.

5. Discussion

5.1 Theoretical implications

An important finding of this study is that late stage venture capitalists exhibit a reluctance to diversify into the early stage venture capital market, and hybrid venture capitalists similarly do not want to increase their early stage commitments. Four complementary causes of this reluctance were identified in the sample of Dutch Venture Capitalists, namely a low return/risk ratio of early stage VC investments, risk of reputational hazard, lack of sector experience and too much time investment. These causes are now briefly reviewed and related to previous scholarly work.

First, the data shows a surprising absence of high return/risk rates as a motivation to invest into early stage portfolio firms. This result is surprising because during the preliminary interviews all VCs stressed the importance of financial performance and growth potential. The empirical results indicate that early stage firms are less lucrative than later stage deals. Scholars have offered a variety of reasons for this lagging performance, which are dominated by the low probability of achieving a highly profitable exit via an IPO. European stock markets are too small (Revest and Sapio, 2010) and too illiquid (Black and Gilson, 1998; Schwienbacher, 2005). More recent work has also pointed towards a low success rate of European NTBFs as an explanation for returns falling behind (Hege et al., 2009). The findings of this study are thus compatible with previous work on return/risk rates in EU venture capital markets.

The potential negative impact of risky early stage investments on their reputation is a barrier for VCs to invest more into early stage portfolios. The results of the survey show that late stage oriented investors do not want to risk their established reputation with early stage investments. This finding is supported by the study of Barnes and Menzies (2005) into the important role of reputation for the fund providers of VCs and the role reputation might have on the NTBFs decision to accept capital from a particular VC. Apart from the work of Barnes and Menzies, reputation has not been extensively studied as a factor in the decision of VCs to start or expand early stage venture capital activities. The confirmation of the effect of reputational hazard on the portfolio share of early stage by this study provides extra empirical backing to the work of Barnes and Menzies and implies that the reputation effect should be investigated further.

Early stage oriented VCs are more closely involved with their portfolio firms, visit these firms more often and maintain portfolios wherein portfolio firms are located further away. The different style of management required for successful management of early stage portfolios is supported by Botazzi et al. (2008) who find that investor activism boosts success. Sapienza (1992) similarly finds that frequent communication is important for success. Early stage investments are more cumbersome and require a different commitment from the VC. Thus, if a late stage VC diversifies into early stage investments there would be significant changes in how they need to allocate their time. This shift in activities is a barrier for late stage oriented VCs who might want to diversify into the early stage market.

Early stage focused VCs are driven by their experience in certain sectors to commit more capital to early stage, whereas late stage VCs are not motivated to do so. Late stage VCs' funds in the sample focus on established industries such as food and retail, while early stage VCs invest predominantly in high tech sectors such as software & ICT and biotechnology. Annual reports of various venture capital

associations consistently confirm a sector bias for the different development stage orientations of VCs. Late stage investors focus on established industries, while early stage firms target high-tech industries (EVCA, 2011; NVP, 2011). The notion of early stage focused VCs committing to high-tech and late stage VCs to established (and often not high-tech) industries is not new (e.g. Brouwer and Hendrix, 1996 or Locket et al., 2002), but the implicit self-reinforcing effect of this sector experience has not received much scholarly attention. If early stage investors develop sector specific expertise that motivates them to stick to early stage investments, and late stage investors develop experience for other industries, a lock-in emerges that reduces stage diversification opportunities of VCs.

VCs are stimulated to invest more into early stage portfolios by the high number of business proposals they receive. The important implication here is that for the current number of venture capitalists, there is no shortage of business proposals or good deals to choose from. This directly contradicts previous findings, for instance by Schertler (2003) who claims that a shortage of human capital on the NTBF market constrains the deal flow for VCs and thus limits the market. The findings of this study also refute the often uttered phrase of "too much money chasing too few good deals" (e.g. Gompers and Lerner, 2001). Current market conditions found in this study contradict these scholars and suggest that a lack of good deals is not a bottleneck for the early stage VC market.

A shortage of capital was also not found to be a barrier for VCs to invest in early stage firms. This could be an effect of previous Dutch policy intervention, as some VCs reported that they were co-financed by public funds. A lack of capital amongst VCs has been the rationale for governments to back VCs with public funds in many countries (e.g. Revest and Sapio, 2010; Humpery-Jenner, 2012). Similar policy intervention in The Netherlands might have contributed to the disappearance of a lack of capital for VCs as a barrier to early stage investment. It is important to note that at this moment, this constraint seems to be resolved so that the focus of policymakers and theoreticians should shift attention away from fund provision to other dynamics of the early stage venture capital market.

For the New Technology Based Firm, a first finding is that the availability of substitutes (which can comprise either debt financing or internal financing) decreases their acceptance of venture capital. The study thus finds that both internal financing and debt financing are preferred over external equity as is stated by the Pecking Order Hypothesis (POH). This finding is also in line with what Colombo and Grilli (2007) found for a sample of Italian NTBFs. However, there are is a number of sources that contradict the POH for NTBFs, most notably Paul et al. (2007) who find that external equity is preferred over debt. Berger and Schaek (2011) claim that the funding of NTBFs is based on appropriateness of the source and not on safety as is claimed by the POH. Clearly, the debate on the pecking order hypothesis has not been settled yet and further research is needed.

The loss of control to a VC is reported by the NTBFs as a barrier to the acceptance of early stage venture capital investment. This is in accordance with other findings in the European VC market. Giudici and Paleari (2000) demonstrate a reluctance to relinquish control to a VC by Italian NTBFs, Berggren et al. (2000) illustrate the same for Swedish NTBFs, and Becker and Hellman (2003, p.16) even claim that German NTBFs called releasing a majority stake to VCs "exploitation". Indeed, one of the major differences between the EU and US VC markets found by Hege et al. (2003) is the difference in VCs' control over the NTBF, for instance indicated by the number of entrepreneurs replaced by the VC. This research confirms this reluctance for the Dutch NTBFs, and the results are thus consistent with many findings across the EU: NTBFs are very averse to giving up control.

NTBFs in this sample did not identify the added value of a VC as a motivation to accept early stage venture capital. In other words, NTBFs do not appreciate the potential value added by the VC in their decision to accept venture capital. This stands in stark contrast with many empirical confirmations of the actual value added by VCs. Engel (2002) find that survival rates and quick growth opportunities increase, Davila et al (2003) find that a VCs presence causes faster growth and Kortum and Lerner (2000) find that VC active areas patent more. The added value of VCs stands virtually undisputed, but this study finds that at a micro level, NTBFs are not driven to accept venture capital because of the value added by VCs. This suggests that Dutch VCs have a serious problem with their image amongst potential clients.

A further barrier indicated by the NTBFs is the lack of local involvement of VCs. This is likely not only attributable to travel distances because The Netherlands is a small country, but instead it hints at a mismatch in clustering of financing and technological activities. Martin et al. (2002) has identified the most important VC regions in the EU and in The Netherlands and concludes that more centralized clusters are needed. The biggest VC concentration in the Netherlands is around Amsterdam, where one third of VC capital is located but only 6% of patents are generated. The Eindhoven 'brainport' region which generates almost half of all Dutch patents, only houses 19% of the Dutch VC industry (Martin et al., 2002; EIM, 2010). These mismatches decrease an NTBFs' acceptance of venture capital since the VCs are unfamiliar with the local environment and building trust relationships is harder across larger distances.

NTBFs in the sample feel hindered by an inability to make informed decisions about the venture capital market. It is not surprising that large numbers of NTBFs are unfamiliar with VC, given that the market is so small. Hendrix and Brouwer (1996) in their study of the Dutch venture capital market confirm the absence of a strong early stage VC tradition in the Netherlands. This lack of experience is a self-reinforcing effect that will likely exist as long as the VC market is relatively small.

This study finds a negative effect of intermediation on the motivation to accept venture capital. Intermediation seems to raise distrust amongst NTBFs for VCs instead of increasing trust. This finding is contradictory to the role of intermediation found in Silicon Valley by Ferrary and Granovetter (2000). The effect of references by intermediaries proposed by Mason (2002) is also absent in the data. This distrust of VCs that are recommended by third parties implies that VCs' image problems are not alleviated by the role of intermediaries.

A last finding is that a match in deal valuation between NTBF and VC is an important driver to accept venture capital funding. An explanation for this is provided by Storey and Tether (1998) who state that NTBFs consequently overestimate the value of their firm. Also, it might be a consequence of the failure of NTBFs to present their business convincingly (Giudici and Paleari, 2000). The ability to reach a valuation match with a VC is a key factor in the decision to accept venture capital and it might be related to the NTBFs' capability to asses and convey firm value.

The stagnation of the Dutch venture capital market can now be better understood. Late stage VCs are not driven to expand into early stage investments and most NTBFs do not understand the value proposition of a VC either through a lack of knowledge and experience or distrust of the VC. Further research with larger samples should be conducted to confirm these findings.

It was the contention of this research that in order to properly capture the dynamics of the venture capital market, investigative efforts should combine macro level research with a closer look at the actual market actors at the micro-level. This paper provides a first step in that direction and presents some results that contradict previous theoretical work. The results should be interpreted with caution due to the methodological issues of this nascent approach, but a micro-level approach to the venture capital market seems to provide valuable new insights into the dynamics of the Venture Capital market.

5.2 Management implications

Dutch NTBFs do not appreciate the value added by a Venture Capitalist. They do not like to cede control over their firm to a VC and they prefer substitutes over venture capital. Additionally, Dutch NTBFs find that VCs local involvement is low which makes it hard to build a trust relationship, and the NTBFs distrust the intermediaries who connect them to certain VCs. All of this combined indicates that Dutch VCs have a bad image amongst the Dutch NTBFs. If the Dutch VC industry wants to increase the demand for early stage venture capital funding, they need to more clearly convey the value they add to the NTBFs in their portfolio. The VCs need to find ways for NTBFs to overcome the control hurdle, for instance by communicating that an entrepreneur can regain control after an IPO. VCs additionally need to engage more in local markets and invest in a direct trust relationship, since NTBFs do not trust the references of intermediaries.

A convincing charm offensive should be initiated by VCs to convince reluctant Dutch NTBFs that venture capital is a good way to grow their nascent business into a successful venture.

At the other side of the equation, NTBFs continue to miss out on realizing their growth potential due to their reluctance to accept early stage venture capital funding. They are inadequately informed about the value added by a VC and about what makes a VC offer a good deal. An understanding that their business might not succeed without the beneficial experience and assistance of a VC could induce NTBFs to accept venture capital.

The few NTBFs that do decide to pursue venture capital funding enhance their chances of being VC backed if they seek Venture Capitalists when they are in more nascent phases of development. They also increase the chances of being VC funded by improving the quality of the financial estimates in their business proposals.

Both Venture Capitalists and New Technology Based Firms can gain from an increased understanding of the factors involved in the others' decision. Both types of actors should make a concerted effort to fathom the others' motivations in order to revitalize and grow the Dutch Venture Capital market which is so important for enabling the Dutch NTBFs to realize their growth potential.

5.3 Policy implications

If the demand for early stage venture capital would soar, policy makers should be aware of the limited growth potential of existing early stage venture capital supply. Late stage oriented VCs indicated multiple barriers to expansion into early stage investments (low return risk rates, lack of sector expertise, potential harm to their reputation and a mismatch of time investment with their current activities). At the same time, early stage VCs reported they already receive high amounts of business proposals and did not experience a lack of capital. Other factors seem to constrain their growth.

As stated, early stage investments require much more attention from the individual VC than late stage VC investments. This directly limits the amount of portfolio firms that can be managed intensively by the currently active early stage oriented VCs, and either more early stage VCs or larger early stage VC firms are needed. However, these individuals might prove hard to find. Botazzi et al. (2008) already emphasized the need of experienced human capital at the supply side of the Venture Capital industry and predicted that human capital development among VCs should be given more prominence. This research supports that notion and encourages policy makers to find ways to stimulate experience entrepreneurs and investors to enter the market of early stage venture capital.

Dutch New Technology Based Firms are presently not convinced by the value proposition of venture capital, and this means that these firms will stick to conventional sources of finance and likely experience the constraints of limited financial capital whilst missing out on the additional benefits of VC involvement. This reluctance to accept venture capital funding seems based on a lack of adequate information about early stage venture capital. It is of paramount importance for the government to facilitate the education of entrepreneurs on the important role VCs can play in growing businesses.

The lack of local involvement of VCs, and the time constraint experienced by VCs also means that clustering early stage Venture Capital Providers with the technology clusters where NTBFs emerge most frequently could reduce barriers for early stage investment.

The primary policy challenge is to lower NTBFs' reluctance to accept early stage venture capital, and then a resulting self-reinforcing effect could drive the venture capital sector forward. Providing an adequate pool of experience venture capitalists that can keep up with a growing demand.

It is hard to understate the urgency of policy intervention targeted at resolving the information market failure of the Dutch venture capital market. The Dutch New Technology Based Firms' reluctance to accept venture capital funding in order to achieve high growth rates has the macro-level implication of slowing down the intrinsic growth of the Dutch high tech industries. The vibrant venture capital markets in countries like the United States and Israel effectively boost their knowledge intensive economies, whilst in spite of ambitious policy targets on R&D expenditures, the Dutch economy risks falling further behind if adequate policy intervention to revitalize the slow Dutch venture capital market is not promptly organized.

5.4 Limitations

Small sample sizes mean that the results must be interpreted with the greatest caution and that the external validity of the results is very limited, especially for the VCs because their sample size is small in an absolute sense and the sample was shown to be more domestically oriented than the population. The limited size of the VC sample further made the use of statistical measures impossible for VCs, and therefore descriptive measures had to be used. Despite significant efforts in increasing the response to the questionnaire with reminders, (e-mail) address verification and inviting respondents with phone calls, a higher response rate could not be achieved. The topic of early stage venture capital is an unfamiliar or sensitive topic for many Dutch VCs and NTBFs alike, making systematic quantitative research of the Dutch early stage venture capital market a daunting task. In retrospect, qualitative inquiry may be better suited for the limited size of the Dutch market. This is something to find out in further research.

A few hypotheses are accompanied with potential measurement problems. The resulting incongruences could be a result of the development of new behavioral indicators which in turn might have induced differences between the concept as measured and the concept as intended. Additionally, reverse causal relationships could have been induced by the wording of the questions. For various NTBF hypotheses, the addition of more indicators could have extended the empirical support for the findings. Future research should focus on expanding and improving the behavioral indicators to tackle these various issues of instrumental or construct validity (Bryman, 2008).

The internal validity of the research is negatively impacted by the presence of suboptimal indicators. However, two sets of indicators were used to indicate the hypothesized effects, and when both types of indicators indicate corresponding effects, the internal validity is considered sufficient. Additionally, where possible the results are confronted with existing research and other empirical findings to further increase internal validity.

6. Conclusion

Diversification or expansion into the early stage venture capital market is an unattractive option for most VCs because four barriers keep them focused on later stage investments, namely low return/risk rates of early stage deals, lack of sector experience, the potential reputational harm of early stage investments and the different time investments required for an early stage portfolio.

The growth of existing early stage venture capital does not seem constrained by a lack of business proposals or a lack of funding. Instead, it may well be a human capital problem caused by individuals (such as experience entrepreneurs) avoiding entering early stage venture capital investments.

These supply side constraints co-exist with important limitations on further development of venture capital demand. NTBFs are not inclined to accept early stage venture capital since they do not make an informed appraisal of the benefits of venture capital. NTBFs do not recognize the added value of a VC, do not want to relinquish control and they prefer the substitutes of early stage venture capital over early stage venture capital. NTBFs report that VCs do not possess enough knowledge of local markets or partners and distrust the recommendations of intermediaries.

These findings imply that policy measures should facilitate the interaction between VC and NTBF so that they can improve their understanding of each other's motives and thereby alleviate the market failure brought about by misguided information. Policy makers should also prevent a shortage of early stage oriented VCs and consider ways to attract new VCs into early stage VC activities and keep them there.

This research used a unique micro-level behavioral approach to the venture capital market and investigated the two prominent market actor types in the venture capital market in one study. Several notions that were familiar to the literature have been confirmed, namely the low returns on the European venture capital market, the aversion of NTBFs to give up control, the Pecking Order Hypothesis and the importance of valuation matches for the NTBF negotiating with VCs.

The study also adds some support for existing hypotheses that have not yet received much scholarly attention, but should be studied more extensively. These are the effects of the reputational hazard associated with early stage investment, the sector experience of VCs, the local involvement of those VCs and the experience of NTBFs in evaluating an offering from a VC.

Finally, several previous empirical findings are not supported by the findings of this study. Most notably, it is this studies' contention that Dutch NTBFs are not motivated to engage in early stage venture capital funding by the value that is added by a VC. Also, intermediation does not have the expected positive effect on NTBFs in accepting venture capital. Furthermore, the Dutch VCs report no lack of business proposals or a lack of capital in their sector.

Quantitative micro-level investigation into the behavior of market actors is accompanied with significant conceptual and practical challenges, especially in a market where early stage venture capital is rather unfamiliar and a field wherein validated behavioral indicators are not readily available yet. However, the new insights brought forward, including results contradicting several widely accepted beliefs, lead this paper to conclude that micro-level empirical research deserves a more prominent place in the ongoing scientific inquiry into the dynamics of venture capital markets.

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Appendices

Appendix A: Survey questions for the VCs

With the use of routing irrelevant questions are bypassed. Questions marked red were excluded for late stage VCs, questions marked in green were excluded for early stage VCs.

1. Wat is uw naam?
2. Wat zijn de eerste vier cijfers van de postcode van de hoofdvestiging van uw fonds?
3. Hoeveel werknemers heeft de fondsmanager? (in Fte's)
4. Kies de rechtsvorm van de fundmanager?
   a. B.V.
   b. C.V.
   c. N.V.
   d. V.O.F.
   e. Stichting
   f. LTD
   g. Overig (nl): …….
5. Wat zijn de namen van uw voornaamste drie durfkapitaal fondsen?
6. In welk jaar zijn de drie voornaamste fondsen gestart met investeren in portfoliobedrijven?
7. Wat is de totale hoeveelheid kapitaal onder beheer van uw voornaamste fondsen?
8. In welke van de volgende sectoren investeert uw durfkapitaalfonds?
   a. Vervaardiging van chemische producten
   b. Vervaardiging van farmaceutische grondstoffen en producten
   c. Vervaardiging van wapens en munitie
   d. Vervaardiging van elektrische apparatuur
   e. Vervaardiging van transportmiddelen
   f. Vervaardiging van medische instrumenten en hulpmiddelen
   g. Maken en uitgeven van media
   h. Software en ICT
   i. Wetenschappelijk onderzoek
   j. Anders, namelijk: (…)
9. In welke van de volgende ontwikkelingsfasen van organisaties stapt uw voornaamste fonds het vaakst in (NVP, 2010)?
   a. Vroege-fase venture capital
   b. Latere-fase venture capital
   c. Expansiefinanciering
   d. Late-fase financiering
10. Hoeveel procent van het geïnvesteerde kapitaal zit in portfoliobedrijven waar uw fonds in de early stage fase instapte? (DEP)
11. Hoeveel procent van het huidige aantal portfoliobedrijven bevond zich in de early stage fase toen uw fonds instapte? (DEP)

12. Geef aan in hoeverre u het eens bent met de onderstaande stellingen met betrekking tot <u>stimulansen</u> voor investering in de afgelopen drie jaar?

De totale rendement/risico verhouding van de totale early stage deal flow is gunstig	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De dealgrootte stemt vaak overeen met de beoogde omvang van een investering	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De mogelijkheden om in samenwerking met andere durfkapitalisten te investeren waren voldoende aanwezig	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
Er waren voldoende aanbevelingen van of verwijzingen door bekende partners	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De hoeveelheid businessplannen voor early stage financiering was voldoende	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De kwaliteit van businessplannen voor early stage financiering was goed	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De kwaliteit van en kennis over het product/de dienst was vaak goed	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De kwaliteit van het topmanagement achter het businessplan was vaak goed	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De marktpotentie van het businessplan was vaak goed	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
De financiële onderbouwing van het businessplan was vaak goed	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
Voor de meeste early stage businessplannen heeft uw fonds specialistische kennis over de **sector**	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee eens
Voor de meeste early stage businessplannen heeft uw fonds specialistische kennis over de **ontwikkelfase**	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens

13. Geef aan in hoeverre u het eens bent met de onderstaande stellingen met betrekking tot <u>barrières</u> voor investering in de afgelopen drie jaar?

De hoeveelheid kapitaal beschikbaar voor investeringen was te beperkt	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
Het reputatierisico geassocieerd met early stage investeringen is te groot	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De concurrentie met publieke financieringsbronnen (Regionale Ontwikkelings Maatschappijen, Innovatiesubsidies) voor het verwerven van portfolio bedrijven verhinderde investeringen	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De reistijd naar portfolio bedrijven was te groot	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De verschillen in wetgeving met het land waar portfoliobedrijven gevestigd zijn verhinderden investeringen	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens

14. In welke mate waren de hieronder genoemde factoren van belang voor uw beslissing om portfolio bedrijven van early stage kapitaal te voorzien gedurende de afgelopen 3 jaar (het gaat hier om de totale deal flow, niet alleen om daadwerkelijke investeringen)?

Factor	Antwoord				
De rendement/risico verhouding van het early stage portfolio bedrijf	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De hoeveelheid kapitaal beschikbaar voor investeringen	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De overeenstemming van de dealgrootte met de beoogde omvang van een investering.	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
Uw reputatierisico geassocieerd met early stage investeringen	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De concurrentie met publieke bronnen van kapitaal (Regionale Ontwikkelings Maatschappijen, Innovatiesubsidies) voor het verwerven van portfolio bedrijven	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De mogelijkheden om in samenwerking met andere durfkapitalisten te investeren	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
Aanbevelingen van / verwijzingen door bekende partners	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk

De hoeveelheid businessplannen voor early stage financiering	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De algehele kwaliteit van businessplannen voor early stage financiering	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De kwaliteit van en aanwezige kennis over het product/de dienst	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De managementkwaliteiten van de aanvrager	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De marktpotentie als omschreven in het businessplan	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
De financiële onderbouwing van het businessplan	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk

De reistijd naar portfolio bedrijven	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
Verschil in wetgeving met het land waar portfoliobedrijven gevestigd zijn	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
Uw ervaring met de **sector** van portfoliobedrijven	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk
Uw ervaring met de **investeringsfase** van portfoliobedrijven	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk

#	Vraag	Antwoordcategorieën
15.	Wat was de groei in Fair Market Value op <u>early stage investeringen</u> van uw fonds(en) gedurende de afgelopen 3 jaar?	<0% / 0-5% / 6-10% / 11-20% / 21%-30% / >31% / Nog geen rendement
16.	Wat was de groei in Fair Market Value op <u>andere investeringen</u> van uw fonds(en) gedurende de afgelopen 3 jaar?	<0% / 0-5% / 6-10% / 11-20% / 21%-30% / >31% / Nog geen rendement
17.	Welk percentage van early stage investeringen is gedurende de afgelopen 3 jaar <u>afgewaardeerd</u> (<u>write-downs</u>)?	n.v.t. / 0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
18.	Welk percentage van early stage investeringen is gedurende de afgelopen 3 jaar <u>afgeboekt</u> (<u>write-offs</u>)?	n.v.t. / 0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
19.	Welk percentage van andere investeringen is gedurende de afgelopen 3 jaar <u>afgewaardeerd</u> (<u>write-downs</u>)?	n.v.t. / 0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
20.	Welk percentage van andere investeringen is gedurende de afgelopen 3 jaar <u>afgeboekt</u> (<u>write-offs</u>)?	n.v.t. / 0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
21.	Welk percentage van early stage investeringsverzoeken gedurende de afgelopen 3 jaar werd afgewezen vanwege mogelijke reputatieschade?	0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
22.	In hoeveel deals van uw huidige portfolio investeert u in samenwerking met andere durfkapitaalfondsen?	0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
23.	Een nieuwe investeerder wil 5 miljoen euro investeren buiten de huidige fondsstructuur. Welk percentage wijst u toe aan early stage investeringen?	0-10% / 11-20% / 21-30% / 31-40% / 41-50% / 51-60% / 61-70% / 71-80% / 81-90% / 91-100%
24.	Vonden aankondigingen in de media van early stage investeringen vaker of minder vaak plaats dan aankondigingen van deals in latere fasen gedurende de afgelopen 3 jaar?	Veel vaker / Vaker / Niet vaker of minder vaak / Minder vaak / Veel minder vaak
25.	Vonden Institutionele beleggers early stage investeringen meer of minder belangrijk voor fondstoekenning dan investeringen in latere fasen gedurende de afgelopen 3 jaar?	Veel belangrijker / Belangrijker / Niet belangrijker of minder belangrijk / Minder belangrijk / Veel minder belangrijk
26.	Maak een top-3 van de volgende investeerders naar het belang van deze investeerders voor uw fonds (1: belangrijkst)	Banken / Verzekeraars / Pensioenfondsen / Kapitaalmarkt / Niet financiële instellingen / Fonds in fonds / Publieke sector / Privé Persoon / Overige
27.	Maak een bottom-3 van de volgende investeerders naar het belang van deze investeerders voor uw fonds (1: minst belangrijk)	Banken / Verzekeraars / Pensioenfondsen / Kapitaalmarkt / Niet financiële instellingen / Fonds in fonds / Publieke sector / Privé Persoon / Overige
28.	Hoe vaak heeft uw fonds gedurende de afgelopen 3 jaar een aantrekkelijke deal verloren omdat het portfoliobedrijf toegang kreeg tot publieke bronnen van financiering (ROM, IPC, WBSO)?	Erg vaak / vaak / Soms / Zelden / Nooit
29.	Op welke manier heeft de aanwezigheid van publieke instanties (zoals een Regionale Ontwikkelings Maatschappij) in een deal uw bereidheid om te investeren beïnvloedt gedurende de afgelopen 3 jaar?	Sterk positief / Positief / Enigszins positief / Geen effect / Enigszins negatief / Negatief / Sterk Negatief

#	Vraag	Antwoordcategorieën										
30.	Zou uw fonds meer of minder in samenwerking met andere fondsen hebben geïnvesteerd, mocht daar gelegenheid voor zijn?	Veel meer	Meer	Niet meer of minder	Minder	Veel minder						
31.	Hoeveel fondsaanvragen heeft uw fonds gedurende de afgelopen 3 jaar in totaal ontvangen?	0-100	101-300	301-500	501-1000	>1001						
32.	Hoeveel fondsaanvragen voor early stage investeringen heeft uw fonds gedurende de afgelopen 3 jaar ontvangen?	0-20	21-100	101-300	301-500	>501						
33.	Welk deel van alle ontvangen early stage fondsaanvragen kwam door de eerste screening fase van uw fonds gedurende de afgelopen 3 jaar?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
34.	Welk deel van alle ontvangen early stage fondsaanvragen kwam door de tweede evaluatie fase van uw fonds gedurende de afgelopen 3 jaar?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
35.	Hoeveel early stage investeringen heeft uw durfkapitaalfonds gedaan in de afgelopen 3 jaar?	0-5	6-10	11-15	16-20	>21						
36.	Hoe zou u uw adviseringsbetrokkenheid bij portfoliobedrijven omschrijven?	Hands-off	Laissez-faire	Balanced	Close Tracking	Co-management						
37.	Wat is de gemiddelde reistijd van uw firma tot early stage bedrijven in uw fonds' huidige portfolio?	0-10 min	11-30 min	31-60 min	61 – 120 min	> 121 min						
38.	Wat is het gemiddelde aantal bezoeken aan een early stage bedrijf in uw portfolio per maand?	1 keer	2 keer	3 keer	4 keer	Vaker dan 4 keer						
39.	Welk percentage van uw firma's huidige early stage investeringen is in het buitenland geïnvesteerd?	0	1-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%
40.	Voor welk percentage van deze buitenlandse investeringen werkte uw fonds samen met een lokale partner in dat buitenland?	0	1-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%
41.	Welk deel van early stage fondsaanvragen werd via een **doorverwijzing** van een bekende partner verworven gedurende de afgelopen 3 jaar?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
42.	Welk deel van early stage fondsaanvragen werd via een **aanbeveling** van een bekende partner verworven gedurende de afgelopen 3 jaar?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
43.	Hoeveel early stage deals werden in de afgelopen 3 jaar afgewezen omdat het niet binnen de sectorfocus viel?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
44.	Hoeveel early stage deals werden in de afgelopen 3 jaar afgewezen omdat het niet binnen ontwikkelfase focus viel?	0-10 %	11-20 %	21-30 %	31-40 %	41-50 %	51-60 %	61-70 %	71-80 %	81-90 %	91-100%	
45.	Hoe vaak was een early stage deal te groot (in termen van investeringsbedrag) voor uw fonds gedurende de afgelopen 3 jaar?	Erg vaak	vaak	Soms	Zelden	Nooit						
46.	Hoe vaak was een early stage deal te klein (in termen van investeringsbedrag) voor uw fonds gedurende de afgelopen 3 jaar?	Erg vaak	vaak	Soms	Zelden	Nooit						

Appendix B: Survey questions for the NTBFs

In contrast to the VC case, routing here was not used for exemption from question, but only to change the wording of the questions to reflect the NTBFs situation (either because they were backed or were not backed by early stage venture capital)

1) Wat is de naam van uw bedrijf?
2) Wat was omzet van uw bedrijf in 2011?
3) Hoeveel werknemers heeft uw bedrijf? (in Fte's)
4) Wat zijn de cijfers van uw postcode?
5) In welk jaar is uw bedrijf met haar huidige activiteiten gestart?
6) Wat is uw naam?
7) Wat is uw e-mail adres?
8) Internationaal patent
   a. EU patent
   b. NL patent
   c. Licentierecht
   d. Auteursrecht
   e. Modelrecht
   f. Er is geen wettelijke bescherming
   g. Anders, namelijk

9) Wie zijn de grootste aandeelhouders in uw bedrijf? (met een aandeel van meer dan %20?)

10) In welke ontwikkelfase bevindt uw bedrijf zich?
   a. Ontwikkeling (nog geen omzet)
   b. Start-up fase (eerste omzet)
   c. Groeifase (eerste winst)
   d. Latere fase (stabiele winst

11) In welke van de volgende sectoren is uw bedrijf actief?
   a. Vervaardiging van chemische producten
   b. Vervaardiging van farmaceutische grondstoffen en producten
   c. Vervaardiging van wapens en munitie
   d. Vervaardiging van elektrische apparatuur
   e. Vervaardiging van transportmiddelen
   f. Vervaardiging van medische instrumenten en hulpmiddelen
   g. Maken en uitgeven van media
   h. Software en ICT
   i. Wetenschappelijk onderzoek
   j. Overige sector, namelijk:

12) Wat is de verhouding eigen vermogen / externe financiering? *N.B. onder externe financiering verstaan we zowel bankleningen als durfkapitaal*

13) Welk gedeelte van het hierboven aangegeven deel externe financiering bestaat uit durfkapitaal? *(Routing was based on this question)*

14) Geef aan in hoeverre u het eens bent met de onderstaande stellingen met betrekking tot **stimulansen** voor het accepteren van een durfkapitaal investering in de afgelopen 3 jaar?

De durfkapitalist zou veel waarde toevoegen aan uw bedrijf	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De mogelijkheid om in een latere fase controle terug te krijgen over het bedrijf was voldoende aanwezig	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
Er waren voldoende verwijzingen en aanbevelingen naar durfkapitalisten door bekende partijen	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
Er was voldoende durfkapitaal beschikbaar in de markt	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De voorwaarden die door durfkapitalisten worden aangeboden waren voor u goed genoeg	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
U had voldoende kennis van de durfkapitaalmarkt om een weloverwogen beslissing te maken	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens

15) Geef aan in hoeverre u het eens bent met de onderstaande stellingen met betrekking tot **barrières** voor het accepteren van een durfkapitaal investering in de afgelopen 3 jaar?

Er waren voldoende andere vormen van financiering (zoals bankleningen, subsidies en eigen vermogen) beschikbaar.	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De verwachte sociale gevolgen (bv. minder kansen op de arbeidsmarkt, reacties van je omgeving) van een mislukking verminderden uw bereidheid om durfkapitaal te accepteren	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De financiële gevolgen van een faillissement verminderden uw bereidheid om durfkapitaal te accepteren	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens
De reistijd naar de bij u bekende durfkapitalisten was te groot	Sterk mee eens	Mee eens	Geen mening	mee oneens	Sterk mee oneens

16) Zet de onderstaande stellingen in een volgorde van meest belangrijk voor uw beslissing voor een financieringsmogelijkheid, tot minst belangrijk voor uw beslissing voor een financier (1 meest belangrijk, 10 minst belangrijk). *N.B. This question used a drag-and-drop ranking system enabled by the survey provider.*

Stelling	Belang
De durfkapitalist zou veel waarde toevoegen aan uw bedrijf	
De mogelijkheid om in een latere fase controle terug te krijgen over het bedrijf was voldoende aanwezig	
Er waren voldoende verwijzingen en aanbevelingen naar durfkapitalisten door bekende partijen	
Er was voldoende durfkapitaal beschikbaar in de markt	
De voorwaarden die door durfkapitalisten worden aangeboden waren voor u goed genoeg	
U had voldoende kennis van de durfkapitaalmarkt om een weloverwogen beslissing te maken	
Er waren voldoende andere vormen van financiering (zoals bankleningen, subsidies en eigen vermogen) beschikbaar.	
De verwachte sociale gevolgen (bv. minder kansen op de arbeidsmarkt, reacties van je omgeving) van een mislukking verminderden uw bereidheid om durfkapitaal te accepteren	
De financiële gevolgen van een faillissement verminderden uw bereidheid om durfkapitaal te accepteren	
De reistijd naar de bij u bekende durfkapitalisten was te groot	

Nr.	Vraag						
17.	Hoeveel externe financiering had uw bedrijf nodig gedurende de afgelopen drie jaar?	€ _____					
18.	Hoe beoordeelt u het gemak waarmee uw firma toegang had tot reguliere financieringsmogelijkheden gedurende de afgelopen drie jaar?	Zeer makkelijk	makkelijk	Gemiddeld	moeilijk	Zeer moeilijk	
19.	Welke van deze mogelijkheden had drie jaar geleden uw voorkeur?	Het hebben van een 10% aandeel in een bedrijf van €5.000.000			Het hebben van een 100% aandeel in een bedrijf van €500.000?		
20.	Hoe denkt u dat de durfkapitalist(en) heeft(hebben) bijgedragen aan de groei van uw firma gedurende de afgelopen drie jaar?	<0%	0-5%	6-20%	21-50%	51-100%	>100%
21.	Wat was de gemiddelde jaarlijkse nettowinst van uw bedrijf gedurende de afgelopen drie jaar?	< 0	€0	€1 – €5.000	€5.001 – €50.000	€50.001- €500.000	€500.001 – €5.000.000	> €5.000.001
22.	Wat was de verwachte groei in winst gedurende de afgelopen drie jaar?	<0%	0%	1-5%	6-10%	11-20%	21-50%	>50%
23.	Hebt u gedurende de afgelopen drie jaar een betaalde baan gehad naast uw eigen bedrijf, en zo ja, voor hoeveel uur per week?	Ja	Nee	Voor ... uur per week.			
24.	Hoe belangrijk was de kennis die een externe financier had van de lokale markt in de keuze voor een externe financier gedurende de afgelopen drie jaar?	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk	
25.	Hoe belangrijk was de mogelijkheid om een vertrouwensrelatie op te bouwen met een externe financier in de keuze voor een externe financier gedurende de afgelopen drie jaar?	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk	
26.	Hoe belangrijk denkt u dat de aanbeveling van uw bedrijf door een derde partij bij een durfkapitalist zou zijn / is geweest om investering in uw bedrijf te overwegen gedurende de afgelopen drie jaar?	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk	
27.	Hoe belangrijk zijn / waren aanbevelingen van derde partijen voor u om een bepaalde durfkapitalist als investeerder te overwegen?	Extreem Belangrijk	Erg Belangrijk	Belangrijk	Weinig belangrijk	Niet Belangrijk	
28.	In hoeverre weerhielden de kosten van een bancaire lening u ervan om dergelijke financiering te accepteren?	In zeer grote mate	In grote mate	Enigszins	Nauwelijks	Niet	
29.	Met hoeveel verschillende durfkapitalisten bent u gedurende de afgelopen drie jaar in gesprek geweest?	Geen	1	2	3-5	>5	
30.	Wat is het totale aantal gesprekken dat heeft plaatsgevonden met deze groep durfkapitalisten?	<absolute waarde>					
31.	Hoeveel aanvaardbare aanbiedingen resulteerden uit al deze gesprekken?	<absolute waarde>					

Appendix C: Inter-association matrix of all variables VC case

Table 53: Descriptive statistics and association measures of three category dependent variable, independent perception variables and the control variables.

Kendall's Tau B associations for perception indicators

	Mean	Std. Dev.	Dep.	Return Risk	Match dealsize	Coop-erate	Refe-rences	Prop quantity	Prop quality	Quality prod	Quality manag	Quality market	Quality fin.	Know Sec	Know Stage	Cap QTTY	Repu-tation	CompP ub	TravelTime	Legis-lation
Dependent	2.333	0.778	1.000																	
Return/Risk	-0.167	1.436	0.000	1.000																
matchdealsize	-0.250	1.603	-0.168	**0.787**	1.000															
cooperate	0.000	0.707	0.255	0.271	0.233	1.000														
references	0.000	0.829	-0.255	0.373	0.400	0.241	1.000													
propquantity	1.111	1.024	-0.035	0.098	-0.194	0.167	-0.334	1.000												
propquality	-0.444	1.446	0.307	0.286	0.125	0.226	0.323	0.000	1.000											
qualityprod	2.556	0.726	0.041	-0.685	-0.449	-0.503	-0.542	-0.262	-0.581	1.000										
qualitymanag	3.333	0.866	-0.400	-0.186	0.073	-0.114	-0.227	-0.073	-0.711	0.426	1.000									
qualitymarket	3.000	0.707	-0.641	-0.112	-0.220	-0.303	-0.038	0.220	-0.604	0.128	0.375	1.000								
Qualityfin.	3.333	0.707	-0.480	0.149	0.257	-0.341	-0.227	0.073	-0.604	0.255	**0.792**	0.458	1.000							
KnowSec	0.833	1.346	-0.341	0.064	0.000	0.356	-0.162	0.281	-0.182	-0.036	0.142	0.284	0.142	1.000						
KnowStage	0.722	1.394	-0.404	0.000	0.000	0.318	-0.223	0.246	-0.388	0.107	0.350	0.350	0.280	**0.866**	1.000					
Capquant	-0.500	1.436	0.312	-0.129	-0.318	-0.066	-0.525	0.445	-0.062	0.147	-0.289	0.108	-0.180	0.277	0.152	1.000				
Reputation	0.000	1.000	0.451	-0.290	-0.508	0.164	-0.295	0.254	0.123	0.037	-0.469	-0.108	-0.613	-0.031	-0.091	0.594	1.000			
CompPub	-0.444	0.882	0.109	0.068	0.300	0.034	0.483	-0.600	-0.097	0.116	0.152	-0.227	-0.038	-0.485	-0.318	-0.657	-0.328	1.000		
TravelTime	-0.313	0.372	0.300	0.431	0.375	0.375	0.281	-0.096	0.315	-0.632	-0.223	-0.154	-0.211	-0.138	-0.180	0.045	0.187	-0.049	1.000	
Legislation	-0.143	0.244	-0.163	-0.230	-0.307	0.307	0.077	-0.153	-0.212	-0.091	0.169	0.338	-0.163	0.298	0.435	0.145	0.435	-0.163	0.730	1.000

Please note that it was not viable to construct an association matrix for the behavioral indicators. Many of the behavioral indicators were not aggregated to hypothesis level, are not comparable across the different venture capital categories and thus are too limited in the number of values that a Kendall's Tau analysis for association would be not result in reliable statistics.

Appendix D: ISREL Correlation matrix of perception variables NTBF case

Table 54: Descriptive statistics and correlations of dichotomized dependent variable, independent perception variables and the control variables.

Descriptive statistics and correlation coefficients (in GLS analysis)

	Mean	Std.Dev	VCDich	Subst	RegainC	VCAddedV	Stigm	BankR	TravelT	IntM	VCLack	ValMatch	Exp	CAge	CDevSt	CIPR
VCDich	0,161	0,374	1													
Subst	0,059	0,200	-0,421	1												
RegainC	0,516	1,817	0,592	-0,366	1											
VCAddedV	0,215	1,118	0,417	-0,423	0,517	1										
Stigm	0,702	1,822	-0,01	0,21	-0,094	-0,133	1									
BankR	0,022	0,764	-0,333	0,335	-0,351	-0,179	0,685	1								
TravelT	0,338	1,084	-0,373	0,238	-0,338	-0,241	-0,214	0,041	1							
IntM	-0,100	0,309	-0,156	0,198	-0,392	-0,183	0,269	0,229	-0,016	1						
VCLack	-0,129	1,018	-0,024	0,523	0,128	-0,139	-0,005	0,027	-0,104	0,112	1					
ValMatch	-0,574	1,497	0,417	0,266	0,446	0,257	0,015	-0,012	-0,006	-0,109	0,528	1				
Exp	-0,222	1,246	0,216	-0,091	-0,054	0,241	-0,326	-0,136	0,056	0,117	0,312	0,269	1			
CAge	5,083	2,310	-0,216	0,163	-0,301	-0,314	0,086	0,013	0,286	0,01	-0,133	-0,175	0,001	1		
CDevSt	2,750	0,967	-0,395	0,071	-0,202	-0,367	-0,117	-0,051	0,198	-0,287	0,108	-0,198	0,018	0,444	1	
CIPR	0.417	0.640	-0,012	-0,138	-0,121	-0,246	-0,274	-0,253	0,01	0,301	0,117	-0,147	0,189	-0,086	0,173	1

Appendix E: ISREL Correlation matrix of behavioral variables NTBF case

Table 55: Descriptive statistics and correlations of dichotomized dependent variable, independent behavioral variables and the control variables.

Descriptive statistics and correlation coefficients (in GLS analysis)

	Mean	Std.Dev	VCDich	BSubst	BRegainC	BVCAV	BStigm	BBankR	BTravelT	BIntNTBF	BVCLack	BMatch	CAge	CDevSt	CIPR
VCDich	0,161	0,374	1												
BSubst	2,278	1,799	0,39	1											
BRegainC	1,472	0,506	0,12	0,009	1										
BVCAV	3,222	1,623	0,328	-0,409	-0,216	1									
BStigm	14,889	9,362	-0,081	-0,156	-0,06	0,208	1								
BBankR	7,833	14,218	-0,13	0,15	-0,059	0,343	-0,017	1							
BTravelT	2,158	1,042	-0,183	0,356	-0,493	0,011	-0,084	-0,033	1						
BIntNTBF	2,450	1,050	0,143	0,179	-0,113	-0,239	0,136	0,061	-0,018	1					
BVCLack	2,600	1,095	0,649	-0,698	-0,103	0,523	0,085	0,034	-0,207	-0,029	1				
BMatch	1,639	1,175	0,376	-0,092	-0,158	0,626	0,385	-0,028	0,183	0,099	0,123	1			
CAge	5,083	2,310	-0,215	-0,008	-0,21	-0,363	-0,022	-0,109	-0,117	0,076	-0,104	-0,181	1		
CDevSt	2,750	0,967	-0,403	0,287	-0,015	-0,528	0,312	-0,211	-0,108	0,304	-0,409	-0,084	0,444	1	
CIPR	0.417	0.640	-0,044	-0,189	0,246	-0,062	0,079	-0,14	-0,523	-0,345	0,002	-0,374	-0,09	0,173	1