

Linking venture capitalist evaluation criteria and success in the digital industry

Do traditional evaluation models still apply?

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Abstract: Despite the attention paid to venture capitalist evaluation criteria and the relation with success in research spanning across industries, literature offering guidance on the digital industry in specific is limited. In order to be able to bridge this literature gap, this study follows a multi-method design, both qualitative and quantitative in nature, and duplicates and extends the study of MacMillan et al. (1987) and Kakati (2003) researching venture capitalists based in Sweden, the Netherlands, and Germany. Our study set the first steps to extend the traditional evaluation model to fit the digital industry. Findings indicated that most of the original evaluation characteristics introduced by MacMillan et al. (1987) still apply today, but that the weighting of these criteria has changed. During the qualitative pre-study new evaluation characteristics become apparent, such as the global scalability of a business model, and were subsequently added to the questionnaire to be tested and measured. Through this study the unique character of the digital industry is illustrated by the new criteria – compared to previous academic studies – that delineated the actual relationship with venture success, such as the existence of workable prototype, customization strategy, global scalability of a business model, and the presence of a well-established distribution channel. Lastly, this study showed that the venture team is not as important a decision factor as previously assumed.

Keywords: Venture Capital, Evaluation Criteria, Digital Industry, Success Factors

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Key Concepts

This section provides a short overview of how some key concepts are defined throughout the thesis and is intended to act as a reference page for the reader. Since this thesis addresses several concepts which have never been touched upon before, the “Kayser and Smit” denotation aims to give meaning to concepts that did not exist before.

Born Globals: Small, usually technology-oriented companies that operate in international markets from the earliest days of their establishment (Knight and Cavusgil, 1996).

Digital Industry: An industry comprised by companies that embrace the Internet as the key component in their business since their business model would not be feasible without the existence of the Internet (Kayser and Smit, 2014).

Digital Start-Up: A newly founded venture in the digital industry (Kayser and Smit, 2014).

Evaluation or Funding Criteria: Criteria used by venture capitalists to decide for or against an investment in a new venture, here comprised out of the five categories characteristics of the venture team, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics (MacMillan et al., 1985; MacMillan et al., 1987; Kakati, 2003).

Venture Capital: Capital invested in a project in which there is a substantial element of risk, where the level of risk is translated in a premium on the investment (C.B. Barry et al., 1990; Gompers and Lerner, 2001, Söderblom, 2012).

Venture Success: Achievement of something desired, planned, or attempted, i.e. sales, market share, cost structure, profit, and return on investment (Kakati, 2003).

1. Introduction

This section introduces the topic and hypothesis of this master thesis (Section 1.1), the theoretical and managerial relevance of the chosen topic and expected contributions (Section 1.2), and includes a road map of the structural outline (Section 1.3).

1.1. Topic and Hypothesis

The decision criteria that venture capitalists use for venture evaluation and their relationship to venture success has been a hot topic for over half a century. Despite the attention paid to this subject in research spanning across industries, literature offering guidance on the digital industry in specific is limited. Not only has the venture capitalism industry changed over the past fifty years, also the digital industry is continuously renewing itself. Anno 2014 digital start-ups are different from their non-digital counterparts due to factors such as being ‘born global’ and increasingly decreasing monetary threshold to invest in new ventures, bringing out the importance of globally scalable business models. This study will contribute to existing literature by assessing if traditional evaluation models still apply or if venture capitalists use different models for the evaluation of digital start-ups. Therefore this study will concentrate on which evaluation characteristics venture capitalists use and assign most weight to and the correlation between those characteristics and the actual venture performance, when evaluating start-ups in the digital industry. The fast-moving pace of the digital industry combined with the dated academic literature on venture capitalists in this research area signals a gap that needs to be explored.

In order to be able to bridge the aforementioned literature gap this paper follows a multi-method design, both qualitative and quantitative. It builds on previous research and duplicates and extends the study of MacMillan et al. (1987) and Kakati (2003) by distributing a questionnaire to venture capitalists based in Sweden, the Netherlands, and Germany, who have experienced both failure and success in the digital industry. Subsequently, the questionnaire asks the venture capitalists to rate one of their most successful ventures and one of their least successful ventures on thirty screening criteria.

1.2. Theoretical and Managerial Relevance

As outlined by Hall and Hofer (1993) and Zacharakis and Meyer (1998) answering the question '*which investment criteria do venture capitalists use when evaluating start-ups*' is important and empirically relevant for several reasons. It is known that the success rate among venture capitalist backed investments is significantly higher than that of their non-backed counterparts. One explanation for this is provided by Baum and Silverman (2004), who state that the dual-role of the venture capital as both 'scout' and 'coach' blurs the lines between 'making' versus 'picking' winners. In the post-event venture performance evaluation methodology this phenomenon may cloud the actual relation between venture capitalist evaluation characteristics and the relationship with success. In addition, entrepreneurs seeking venture capitalist funding will greatly benefit from the opportunity to understand which factors their business model will be evaluated upon. This question was extended by Roure and Madique (1986), MacMillan et al. (1987), Dubini (1989), Roure and Keely (1990), and Kakati (2003), who not only looked at the weights assigned to each venture characteristic by the venture capitalist, but also at the correlation of these characteristics with venture success. Therefore, an additional argument to explore this topic is that it could potentially further enhance the success rate of venture capitalist firms.

Initial explorative research shows that the examination of venture capitalist decision criteria in new venture evaluation has a strong foundation in academic literature (MacMillan et al., 1985; Roure and Madique, 1986; MacMillan et al., 1987; Dubini, 1989; Roure and Keeley, 1990; Siegel et al., 1993; Hall and Hofer, 1993; Chandler and Hanks, 1994; Muzyka et al., 1996; Zacharakis and Meyer, 1998; Shepherd, 1999; Bachher, 2000; Zacharakis and Shepherd, 2001; Kakati, 2003; Shepherd et al., 2003; Chorev and Anderson, 2005; Mann and Sager, 2006). A closer look at the content of thought-leading papers of the past few decades shows that different dimensions are explored, among which a strong focus on the actual decision process of venture capitalists (Hall and Hofer, 1993; Fried and Hisrich, 1994; Zacharakis and Meyer, 1998), a pure focus on the weight venture capitalists attach to each venture characteristic (Chorev and Anderson, 2005), and the isolated correlation between certain characteristics and venture success (Roure and Madique, 1986; MacMillan et al., 1987; Dubini, 1989; Roure and Keely, 1990; Kakati, 2003).

The explorative study shows that even though our research seems to have many touch-points with existing research, it extends existing academic literature in various ways. Despite the attention paid to this subject across industries, literature offering guidance on the digital industry in specific is limited, ensuring theoretical relevance of the chosen research hypotheses. This area of research is only explored under the overarching umbrella of the information technology industry (Roure and Madique, 1986; Roure and Keeley, 1990; Bachher, 2000; Kakati, 2003; Chorev and Anderson, 2005; Mann and Sager, 2006). The digital industry, comprised by companies that embrace the Internet as the key component in their business since their business model would not be feasible without the existence of the Internet, is unique for various reasons. Firstly, young companies operating in the digital industry face additional challenges compared to start-ups operating in other industries as the technologies that these firms use are often still in the developing stage, applications may be unclear, and the market may not yet be established (Chorev and Anderson, 2005). Also, it is often argued that these companies are ‘born global’, emphasizing the necessity of a globally scalable business model upon establishment of the venture. Therefore, even though our research model is based on data from the Swedish, Dutch, and German market, many of the aspects are global – consequently, this study may have broad applicability (Chorev and Anderson, 2005). Thirdly, the monetary threshold to invest in the digital industry has decreased due to the development of the digital industry; venture capitalists state that instead of investing in few ventures for large sums of money, the market has shifted to making many small investments in a large pool of companies. The predominant view is that the risk is diversified because if a start-up succeeds in the digital industry, it often succeeds ‘big time’.¹ Lastly, both products as companies have a rapid life cycle and are highly scrutinized under the public eye.

Our paper aims to replicate the research design used by MacMillan et al. (1987) and Kakati (2003) – who have taken a heterogeneous approach and used a cross-sectional sample of start-ups – while focusing solely on the digital industry. Even though it seems counter-intuitive to use a replication study rather than an explorative study in an environmental context which has changed so significantly over the past decade, our thorough qualitative

¹ Insights from the qualitative pre-study with a small selection of venture capitalists in Sweden

pre-study confirms that most of the criteria used in the original questionnaire are still valid today and only the weight put on each of them has changed. Thus, the pre-study allows us to make appropriate modifications to the survey and increases the ability to interpret the results accurately. Therefore, this paper aims to contribute to the existing body of research on the evaluation criteria of venture capitalists and the relation to venture success by applying these insights to the digital industry.

1.3 Thesis Roadmap

The structure of this thesis is illustrated in Figure 1 and is modelled according to an hourglass-like form, mirroring chapter 1 to 3 with chapter 4 to 6, i.e. the questions raised in the introduction (Chapter 1) are answered in the concluding remarks (Chapter 6), the hypotheses discussed in the literature review (Chapter 2) are addressed in the discussion (Chapter 5), and the statistical analyses run in the results (Chapter 4) follow the methodology of the preceding chapter (Chapter 3).

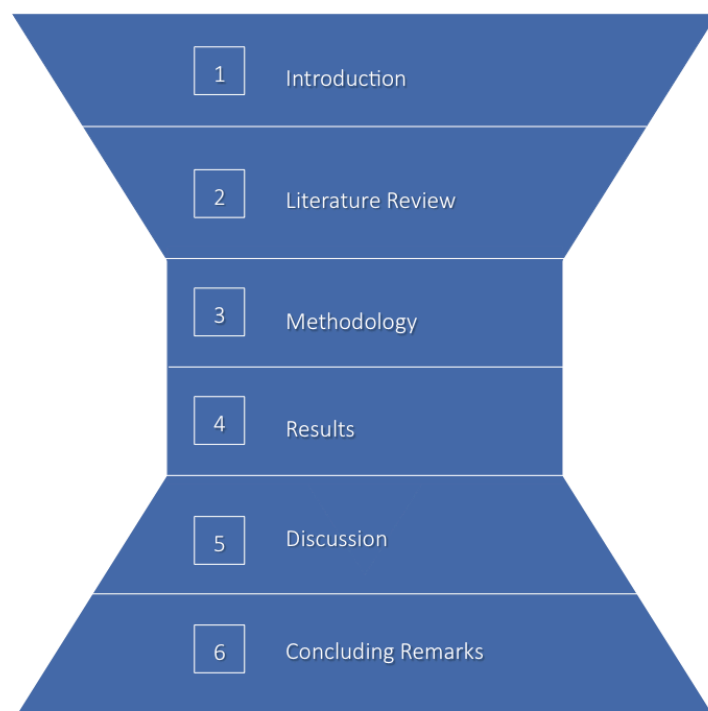


Figure 1 – Thesis road map illustration

Just as the introduction (Chapter 1) narrowed the research scope to only include the digital industry, the literature review (Chapter 2) also follows a funnel shape by first briefly introducing its reader to the venture capitalist and digital industry, before moving on to the second level where the venture capitalist decision process and venture capitalist evaluation and performance criteria will be discussed. On the third level an in-depth analysis of existing literature on all five different evaluation criteria, i.e. characteristics of the venture team, resource-based capabilities, competitive strategies, product/service characteristics, and market characterises, will be conducted before arriving at the theoretical gap. From the theoretical gap follow the six hypotheses that this paper will address. The methodological choices to design the research framework to optimally match these six hypotheses will be described in the next chapter (Chapter 3). This is followed by the results of the subsequent data collection and analysis (Chapter 4). In turn, the next chapter follows the opposite design of chapter 2, and adopt a pyramid-like shape (Chapter 5). First the findings in relation to the hypotheses will be discussed, after which the scope will be expanded by touching upon other interesting findings of both theoretical and managerial relevance, potential limitations and critical reflection on our research, and potential for future research. This thesis will be concluded by addressing the research question: “Do traditional venture capitalist evaluation models still apply for the digital industry” (Chapter 6).

2. Literature Review

After briefly touching upon the aim and scope of the literature review (Section 2.1), this section provides a general background of the venture capitalist and digital industry (Section 2.2), presents an overview of key concepts (Section 2.3), identifies the theoretical gap (Section 2.4), and introduces the six hypotheses that flow from the gap (Section 2.5).

2.1. Aim and Scope

In the literature review, a selection of studies spanning the period of 1985 to 2014 is evaluated with as goal to establish the current state of research regarding the success factors of start-ups and the investment criteria venture capitalists use when evaluating these factors, ensuring both depth and breadth of the selected research material. The focus will lie on identifying gaps that exist in the current literature. Rapid changes in the digital industry, the venture capital industry, and the start-up environment, combined with the fact that the latest applicable study in this area was published in 2006, signal the need for a deeper exploration of the topic.

2.2. General Background

The following sections will provide an understanding of the general frame of this study.

2.2.1. Venture Capitalist Industry

Venture capitalism currently spans little over half a century, originating from 1946 when the first venture capital firm called American Research and Development was founded (Gompers and Lerner, 2001). Nowadays venture capital firms fulfil a unique role in financial markets and typically invest in high risk – and potentially high reward – entrepreneurial ventures (C.B. Barry et al., 1990; Gompers and Lerner, 2001). Venture capitalists may or may not fund a firm depending on their estimates of the likelihood and timing of certain anticipated exit alternatives (Kaplan & Stromberg, 2000). The more risky the investment, the higher the premium in form of equity venture capitalist will demand to compensate for the risk factor of the investment. The bulk of all venture capital investments are carried out in industries such as software, telecommunication or biotechnology. It is important to note that venture capital

makes for only one of the many roads start-ups can take in their quest for funding. Companies with limited cash flows or excessive leverage are more likely to issue external equity because additional debt will most likely be difficult to obtain. Start-ups with more physical assets are more likely to use external debt as tangible assets in the form of collateral are considered to reduce adverse selection and moral hazard. In case of default these ventures will likely give a higher liquidation value. Firms with strong intangible assets, i.e. patents, trademarks, or human capital, seek external equity. Since equity is only available to a limited extent, these firms are financially more constrained than their peers (Söderblom, 2012). The most common alternatives to venture capitalist financing are traditional bank financing or business angels. Traditional bank financing accounts for the largest part of entrepreneurial finance and has the advantage that the entrepreneur retains complete ownership of the venture (Bettignies and Brander, 2007). Unlike bank financing and in some cases similar to business angels, venture capital provides managerial contributions to the venture. Business angels differ in that they invest their own money whereas venture capital organizations often operate through fund-based investment. Consequently, the screening process of venture capitals often is more regulated and in-depth. Compared to business angels, venture capitalists usually demand more contractual power over their investments, are more concerned with exit potential, and often invest at later stages, whereas business angels prefer early seed investments (Van Osnabrugge, 2000). In addition, venture capitalists tend not to be one-time investors but rather strive for continuous involvement and on-going business development. Therefore the investments of venture capitalists are often carried out in multiple stages that are coherent with major steps in the development of the venture, making periodical reviews and re-valuations not uncommon (C.B. Barry et al., 1990). To be more specific, these different periods are referred to as *Seed*, *A*, *B*, *C*, *D* and *E* investment, whereby only Seed, A and B investments are seen as pure-play venture capital investments. Due to their maturity, C, D and E investments are not classified as high-risk investments². Considering the fact that the venture capital industry has a direct relation with the current state of the industry its investments are aimed at, the developments of the digital industry are directly intertwined with those of the venture capital industry.

² Insights from the qualitative pre-study with a small selection of venture capitalists in Sweden

2.2.2. Digital Industry

Independent of the industry a company operates in, over the past decades nearly every firm has been affected by the developments in technology that kick-started the ever-increasing digitalization of our society. As early as in 2001 there already was a widely embraced understanding that electronic commerce or business are more than just another way to sustain or enhance existing business practices, and rather a disruptive innovation that radically changes the traditional ways of doing business (Lee, 2001). The disruptive attributes of the digital movement are numerous: economics of exchange of information (i.e. cancelling out the trade-off between reach and richness of content); connectivity and interactivity (i.e. real-time pricing); merchandise exchange (i.e. mass customization) (Lee, 2001). The threshold of investment is continuously decreasing in the digital industry, effectively lowering the barriers for entrance for new competitors. The global scale of the digitalization movement made new combinations of physical and virtual business models possible, such as e-shops, e-procurement, third party marketplace, virtual communities, and information brokerage (Timmers, 1998).

Significant differences in revenue and profitability can be observed in companies which embraced this paradigm shift, such as the gaming industry (Kücklich, 2005), and in companies that missed the trend or were slow adaptors, such as the music industry (Knopper, 2004). Taking the gaming industry as an example, some firms have opened up their proprietary content for consumers to contribute, resulting in an end-product that is of higher quality due to tapping into the knowledge of crowds, lower development costs due to the outsourcing component, and ultimately closer to the consumers' needs (Arakji and Lang, 2007). The understanding of the concept 'digital industry' in this thesis is an industry comprised by companies that embrace the Internet as the key component in their business since their business model would not be feasible without the existence of the Internet. Examples of ventures that fall into this category are numerous, ranging from the electronic retailing website Zalando to the e-gaming application World of Warcraft. In short, in the digital industry different rules and principles apply – this paper argues that these dissimilarities extend to the different evaluation criteria venture capitalists use when assessing the potential of digital start-ups.

2.3. Key Topics and Concepts

Generally, venture capital backed firms are more successful than non-capital backed ones (Hall and Hofer; 1993). However, various academic authors differ in their findings related to which company characteristics hold the key to venture success.

2.3.1. Venture capitalist Decision Process

The decision-making process regarding the firms venture capitalists should place an investment in, is an integral part of their competitive advantage (Hall and Hofer, 1993; Fried and Hisrich, 1994; Zacharakis and Meyer, 1998).

Hall and Hofer (1993) found that different evaluation criteria are important in different phases of the venture capitalist decision process. Fried and Hisrich (1994) suggest the following six-phase venture capitalist decision making model with continuous gate decisions: origination; venture capital firm-specific screening; generic screening; first-phase evaluation; second-phase evaluation; closing. During the initial screening process venture capitalists focus on fit with the venture capitalist firm's leading guidelines, long term growth, and long term profitability, while only at later stages the venture team itself is considered as a key decision factor (Hall and Hofer; 1993). Similarly to Fried and Hisrich (1994) and Hall and Hofer (1993), Zacharakis and Meyer (1998) focused on the process of selecting which companies to finance. The study criticises that most of the studies that identify the decision criteria of venture capitalists are relying on post priori methodologies such as interviews and questionnaires with venture capitalists. Consequently, such methods take for granted that venture capitalists understand their own decision making process and know on what criteria they base their decisions. Often, however, people fail in introspecting due to the recall bias that explains the disparities in the recall of experienced events to the original setting. The study found that venture capitalists usually are consistent in their decision-making process without actually being consciously aware of its structure. Therefore, Zacharakis and Meyer (1998) suggest that past research needs to be evaluated with a new perspective in order to interpret the results correctly. Furthermore, venture capitalists are overconfident and this overconfidence adversely affects their decision making (Zacharakis and Shepherd, 2001). Since experience with a venture capital task is curvilinear related to decision reliability,

showing an inverted U-shaped function, there seems to be an optimal level of experience when making venture capital related decisions (Shepherd et al., 2002).

2.3.2. Venture Capitalist Evaluation Criteria

A closer look at different evaluation criteria quickly reveals that there are numerous different angles on the topic, varying from *Venture teams* (MacMillan et al., 1985; MacMillan et al., 1987; Dubini, 1989; Roure and Maidique, 1986; Roure and Keely, 1990; Siegel, 1993; Muzyka et al., 1996; Zacharakis and Shepherd, 2001; Kakati, 2003), *Resource-based capabilities* (Siegel, 1993; Chandler and Hanks, 1994; Kakati, 2003; Chorev and Anderson, 2005), and *Competitive strategies* (Siegel, 1993; Chandler and Hanks, 1994; Muzyka et al., 1996; Kakati, 2003; Chorev and Anderson, 2005), to *Product/ Service characteristics* (MacMillan et al., 1985; MacMillan et al., 1987; Roure and Maidique, 1986; Roure and Keely, 1990; Kakati, 2003), and *Market characteristics* (MacMillan et al., 1985; MacMillan et al., 1987; Roure and Maidique, 1986; Roure and Keely, 1990; Siegel, 1993; Muzyka et al., 1996; Shepherd et al., 2000; Kakati, 2003).

Before further diving into the five different evaluation criteria, a literature table presents the four key studies on which this research paper is based (Table 1). Macmillan et al. (1987) based its methodology and research design on the previous work of MacMillan et al. (1985), therefore the latter is included in this figure for the sake of completeness. In turn, the two subsequent studies, Dubini (1989) and Kakati (2003), build on the findings and methodology used in the paper of Macmillan et al. (1987). This thesis would mark the third replication study using the research design as delineated by MacMillan et al. (1987). A short overview of these four thought-leading studies will be provided in terms of data gathering, data analysis, main findings, and main limitations.

Author(s)	Year	Sample & Data Gathering	Data Analysis	Main Findings	Comments and Limitations
MacMillan, Siegel, Narasimha	1985	<ul style="list-style-type: none"> Interview 14 VCs Questionnaire 102 VCs 	<ul style="list-style-type: none"> Factor analysis 	<ul style="list-style-type: none"> Entrepreneurial team is the most important factor in VC decision-making Identified the most important evaluation criteria subdivided under the brackets entrepreneurial team, product/service, market, and financial 	<ul style="list-style-type: none"> Self-reporting bias Confirmation bias
MacMillan, Zemann, Narasimha	1987	<ul style="list-style-type: none"> Interview: 6 VCs Questionnaire 67 VCs (150 Ventures) 	<ul style="list-style-type: none"> Cluster analysis Regression analysis Factor analysis 	<ul style="list-style-type: none"> Identified three clusters of unsuccessful ventures and four of successful ventures and discovered that each class of successful ventures has a lookalike class of unsuccessful ventures Found that the only consistent predictors of venture success were degree of initial competitive insulation and degree of market acceptance 	<ul style="list-style-type: none"> The amount of heterogeneity in the venture capital community impedes on the ability to distinguish patterns in the data results Recall bias Self-reporting bias Confirmation bias
Dubini	1989	<ul style="list-style-type: none"> The same sample and database was used as Macmillan et al. (1987) 	<ul style="list-style-type: none"> Cluster analysis Regression analysis 	<ul style="list-style-type: none"> Identified four clusters of VCs with different entrepreneurial team criteria important for each cluster Attention to detail and capacity to assess and react well to risk were pervasive predictors of companies' performance 	<ul style="list-style-type: none"> No cost-structure reported in performance criteria Limited by solely using a questionnaire
Kakati	2003	<ul style="list-style-type: none"> Interview: selected VCs (see limitations) Questionnaire 27 VCs 	<ul style="list-style-type: none"> Cluster analysis Regression analysis Factor analysis 	<ul style="list-style-type: none"> Entrepreneurial quality play as critical a role as other variables in the success of a new venture Successful ventures follow multiple patterns of strategic behaviour, i.e. venture performance is superior when two or more competitive strategies are used in concert Choice of strategy should be linked to resource-availability with the firm in addition to the industry structure The presence of diversified skills and capabilities, in which technological expertise is balanced with business skills and capabilities in other areas such as marketing, input-sourcing, and general management, is the key success factor in technology-based start-ups The traditional new venture model (that have dominated the academic research) must be extended to incorporate variables related to entrepreneurs, resource-based capabilities, strategies, industry/market structure, fit between resource availability and strategies, between market structure and strategies, and interactive effect of these factors 	<ul style="list-style-type: none"> Since it was felt that an upward and downward biases would 'force' the results, the VCs were interviewed with special emphasis on those criteria, which are rated very high or very low and adjusted the rating where necessary, effectively creating a potential interviewer bias Recall bias Self-reporting bias Confirmation bias Relatively small sample compared to other academic papers

Table 1 – Key replication studies

As apparent from the table above, not all authors agree in their methodology and findings. Therefore all the evaluation criteria used in this study will be discussed in the following sections by comparing the concepts of the different authors. Each section will end with a table summarizing the working definitions of the criteria in order to avoid ambiguity (Table 2 to Table 6).

2.3.2.1. Characteristics of the Venture Team

In 1985, MacMillan, Siegel, and SubbaNarasimha conducted a study that identified the most

common selection criteria used by the venture capital industry and how these different criteria were weighted; the study confirmed the frequently iterated position that ultimately the quality of the entrepreneur determines the funding decision of venture capitalists. Proof for this is provided by the fact that five of the top ten most important decision criteria relate to the personality or experience of the entrepreneur (MacMillan et al., 1985). This study was the basis for the first empirical study focusing on the research area and methodology applied in our paper, namely MacMillan et al. (1987).

MacMillan et al. (1987) extended the study by addressing whether these criteria are actually appropriate in differentiating successful and unsuccessful ventures. At this point the commonly held belief was that investment decisions are mostly based on gut feeling. In response, MacMillan, Zemann, and SubbaNarasimha (1987) attempted to identify any criteria that consistently predict outstanding performance.

Building on the work of MacMillan et al. (1985; 1987) Dubini (1989) determined which venture team characteristics are useful predictors of performance if product and market conditions are given. This scenario has high real-world applicability as venture capitalists have great ways of scanning and evaluating product and market characteristics but difficulties in measuring behavioural characteristics. The study was conducted using the data obtained by MacMillan et al. (1987). Dubini (1989) supported the relevance of her study by the conclusion of Goslin and Barge (1986), who found that management team and venture team characteristics have a greater impact on the venture capitalists' evaluation and selection process of new ventures, than product and market characteristics. Dubini (1989) concluded that capacity for intense and sustained effort is especially important in established markets with high competition, and that ability to assess and react to risk is crucial in situations where the evaluation of the market is difficult. Furthermore, she found that attention to detail and capacity to assess and react well to risk are pervasive predictors of company performance. However, the results of the study should be interpreted with care as no pre-study or direct interviews with venture capitalists were conducted. Thus, no guarantee of the correct understanding and interpretation of the survey results can be given.

The work of Kakati (2003) is the closest to the proposed research strategy. The study seeks to identify criteria that influence the performance of high-tech new ventures. For

this twenty-seven venture capitalists were asked to fill out an adaption of the survey from MacMillan et al. (1987) extended by two categories: competitive strategy and resource-based capability. The study reveals that the entrepreneurial quality, resource-based capability, and competitive strategy are the main determinants of success of a new venture. The study thereby opposes the widely accepted view that the venture team is the most important success factor of a venture (Roure and Maidique, 1986; MacMillan, 1987; Roure and Keely, 1990; Siegel et al., 1993). In contrary, it suggests that the entrepreneurial capability plays just an important role in the success of a venture as the other characteristics.

Taking a closer look at the venture team, Roure and Maidique (1986) reported on prefunding factors that influence the success of high-technology start-ups and found that most of the successful ventures had founders that were experienced in both working with each other as well as in the function they worked, findings that are partly supported by Roure and Keely (1990) and Siegel (1993). In a later study conducted by Roure and Keely (1990) over a slightly different sample – most of the ventures in the sample were in the electronic or information technology sector – the authors concluded that completeness of the founder team had a positive effect on the ventures' success – findings supported by Zacharakis and Shepherd (2001). Siegel et al. (1993) used two pools of companies to identify unique characteristics in both low and high growth ventures: one pool consisting of relatively young companies and one consisting of larger and more mature companies. For this study especially the characteristics of young high-growth ventures are of interest, as these are likely to be coherent with the investment decision factors of venture capitalists for start-ups. Siegel et al. (1993) concluded that industry experience of the management team is the only factor of the venture team that can be clearly linked to high growth firms - this link holds true for both young and mature companies. To this Muzyka et al. (1996) and Bachher (2000) add that a management team should be balanced, i.e. comprised of members with different backgrounds. Chorev and Anderson (2005) developed a model that evaluates factors critical for the success of high-tech ventures in Israel and add to the previous findings that core team commitment is a critical factor for venture success.

Meta-Category Discussed	Working Definition	Other Meta-Categories			
Characteristics of the venture team	<ul style="list-style-type: none"> • Familiarity with the market targeted by the venture • Track record that was relevant to the venture • Ability to articulate well when discussing venture • Personal compatibility with me • Degree of leadership ability demonstrated in the past • Capacity for sustained and intense effort • Attention to detail • We were already familiar with the venture team's reputation • The venture was referred to us by a trustworthy source • Ability to evaluate and react well to risk 	Resource-Based Capability	Competitive strategy	Product/Service characteristics	Market characteristics

Table 2 – Working definition of characteristics of the venture team

2.3.2.2. Resource-Based Capabilities

Chandler and Hanks (1994) and Kakati (2003) agree that venture performance stems from resource-based capabilities. Chorev and Anderson (2005) extended this concept further and developed a model that evaluates factors critical for the success of high-tech ventures in Israel. These factors were categorised in 'important' and 'critical' factors. The factors considered to be important were research and development, management, and customer relationships, and the factors considered to be critical were the idea, expertise and marketing. All these critical factors have the common nominator of being internal and therefore under the span of control of the company. In contrast, external factors such as the business environment, economy or politics were identified to be the least important. The earlier findings of Siegel et al. (1993) also emphasize the importance of close customer contact: in the pool with mature companies the ability to develop close customer contact was a unique factor for high-growth ventures.

Meta-Category Discussed	Working Definition	Other Meta-Categories			
Resource-Based Capabilities	<ul style="list-style-type: none"> Technical capability (Technology; Technical expertise; Expertise in product development) Marketing capability (Expertise in customer service; Adaptability to market dynamics; Marketing expertise; Distribution logistics) Input-sourcing capability (Access to low cost of capital; Skilled labor) Managerial capability (Problem-solving; Decision making; Employee retention; Managing collaboration and networking) 	Characteristics of the Venture Team	Competitive strategy	Product/Service characteristics	Market characteristics

Table 3 – Working definition of resource-based capabilities

2.3.2.3. Competitive Strategies

Combining multiple strategies and ensuring a high degree of fit with firm resources can lead to higher venture performance (Chandler and Hanks, 1994; Kakati, 2003). Muzyka et al. (1996) and Chorev and Anderson (2005) also underline the criticality of strategy in determining venture success. Siegel et al. (1993) argue that the link between a firm's strategic profile and optimal growth strategy varies according to the age and size of the firm. While young high-growth companies are more focused on a single product strategy, successful mature companies show significant product and market diversification. Furthermore, Siegel et al. (1993) recognised that a lean set up results in high growth in young ventures while it was no discriminating factor in mature firms.

Meta-Category Discussed	Working Definition	Other Meta-Categories			
Competitive Strategies	<ul style="list-style-type: none"> Innovation strategy (Emphasis on product innovation; innovation in marketing techniques; packaging) Quality strategy (Emphasis on producing error free products; offering superior products to customer) Cost strategy (Emphasis on cost reduction in all facets of operations; process innovation to reduce cost; improve productivity) Customization strategy (Emphasis on meeting unique customer requirements and tastes) 	Characteristics of the Venture Team	Resource-Based Capabilities	Product/Service characteristics	Market characteristics

Table 4 – Working definition of competitive strategies

2.3.2.4. Product and Service Characteristics

According to Chorev and Anderson (2005) the idea on which the business plan is based is critical to the success of the venture. Another key determinant of venture success is if the company managed to attain a sustainable competitive advantage through technological superiority of the product (Roure and Maidique, 1986; Roure and Keely, 1990).

Mann and Sager (2006) took yet another approach and established a relationship between the patenting behaviour of start-ups and their progress through the investment cycle. A very high and strong correlation was found between the existence of registered patents and the success in the venture capital cycle. Success in this was measured by variables such as number of investment rounds, total investment amount, or longevity of the venture. An important observation was also that the firm's success in the investment cycle did not majorly depend on the amount of registered patents but rather on the ownership of at least one patent.

Meta-Category Discussed	Working Definition	Other Meta-Categories			
Product/Service Characteristics	<ul style="list-style-type: none">• Business model was globally scalable• Product developed to the point of functioning prototype• The product was “high-tech”• Protection of product• The product enjoyed demonstrated market acceptance	Characteristics of the Venture Team	Resource-Based Capabilities	Competitive Strategies	Market characteristics

Table 5 – Working definition of product/service characteristics

2.3.2.5. Market Characteristics

Prior academic research has indicated that VCs do not quite trust entrepreneurs' optimistic projections regarding their future returns and prefer paying more attention to market growth rate and whether a product satisfies a market need (MacMillan et al., 1985; 1987). Building on the topic of market characteristics, Roure and Maidique (1986) state that successful ventures target markets with high buyer-concentration, findings that are in line with MacMillan et al. (1987) who established that the degree of competitive threat and market acceptance are two factors which, if present, consistently lead venture success. Shepherd et al. (2003) partly agree and argue that management competence and the degree of competitive rivalry are the two most important criteria in VCs' evaluations of new ventures.

Muzyka et al. (1996) add to this that the size and growth rate of the market are important dimensions to explore. Further viewing angles are introduced by Roure and Keely (1990), who argue that the expected time for product development and buyer concentration has an inverted U-shape relationship towards success. The statement that factors such as high market growth or anticipated high gross margins can be identified in both successful and unsuccessful ventures, thus are not a prefunding factor influencing the success of high-technology start-ups, by Roure and Maidique (1986), is opposed by Siegel et al. (1993). In contrast, Siegel et al. (1993) state that only rapid market growth contributes to the high-growth rate of successful mature ventures.

Meta-Category Discussed	Working Definition	Other Meta-Categories			
Market Characteristics	<ul style="list-style-type: none"> Target market enjoying a significant growth rate An existing market would be simulated Well-established distribution channel If 'yes' to the aforementioned question, did the venture team have access to it? Competition present or anticipated in the first two years Venture in an industry with which we are familiar The venture could create an new market 	Characteristics of the Venture Team	Resource-Based Capabilities	Competitive Strategies	Product/Service characteristics

Table 6 – Working definition of market characteristics

2.3.3. Venture Capitalist Performance Criteria

Considering that anticipated venture performance is the ultimate decision factor used by venture capitalists to evaluate if a venture is worth investing in, the relation between venture characteristics and success is an essential one. In order to measure venture performance the definition of MacMillan et al. (1987) and Kakati (2003) are used in our study (Table 7).

Meta-Category Discussed	Working Definition	Meta-Category Discussed	Working Definition	Meta-Category Discussed	Working Definition
Revenue	<ul style="list-style-type: none"> Sales Market Share 	Profitability	<ul style="list-style-type: none"> Profits ROI 	Costs	<ul style="list-style-type: none"> General and administrative costs Production costs Marketing costs

Table 7 – Working definition of performance characteristics

During the qualitative pre-study it became clear that venture capitalists attach most importance to the *Return on investment* variable, therefore this is taken into account during the analysis of data. It is important to note that not all performance variables will be of equal importance to different ventures, therefore multiple performance criteria were used to overcome the deficiency of using a single criterion.

2.4. The Theoretical Gap

Following from the preceding academic analysis a clear theoretical gap can be observed. Three pillars lie at the base of this theoretical gap: the fact that the venture capital industry has changed over time, the rapid development of the digital landscape, and the fact that the academic literature is partly incomplete and out-dated (Figure 3).

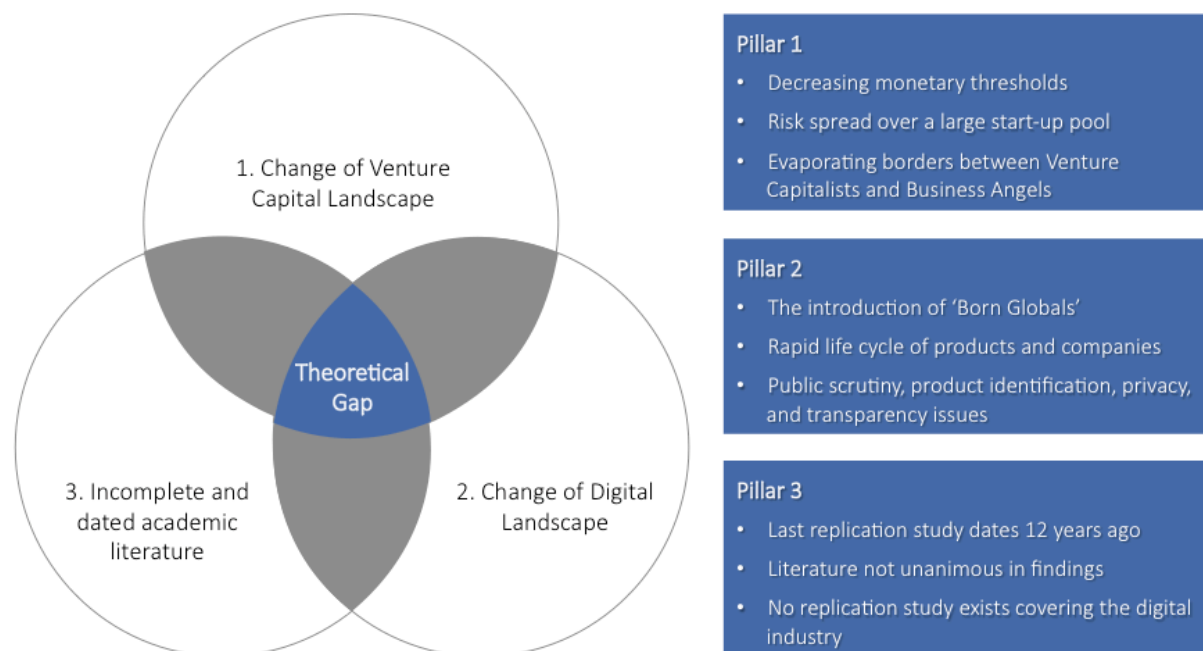


Figure 2 – Three pillars of the theoretical gap

Addressing the first and second pillar, it is clear that both the digital industry and the venture capitalist industry have changed over the past few decades. In the venture capitalist industry there is less initial investment required than in the past, improving the deployment of capital from an ROI perspective and from the perspective of the digital industry there is more focus on scalability of businesses. This is underlined by the statement from venture capitalists that at the moment the only markets where a venture can generate enough ROI without crossing the borders of the country where the venture originates from are the

United States, China, and Israel³. As highlighted by our qualitative pre-study, instead of investing in few ventures for large sums of money, the venture capitalist market has shifted to making many small investments across a large pool of companies. Also, the slow assimilation of both the objectives and the practices of venture capitalists and business angels has implications for the financing decisions of digital ventures, potentially forcing venture capitalists and business angels to compete in the same financing phases. In turn, the rapid product life cycle, transparency and privacy issues, and high degree of public scrutiny make these ‘born globals’ worth a closer look when it comes to investment decisions and their implications. When combining the aforementioned factors with low switching costs for consumers it quickly becomes clear why the performance of digital ventures is so sensitive to external developments.

The third pillar, addressing the fact that much of the existing academic literature is incomplete and dated, is comprised out of several building-blocks. Firstly, the sheer amount of replications of the original study from MacMillan et al. (1987) indicates its significance to the corporate world and its appropriateness to measure the anticipated results – assumptions that are underlined by our qualitative pre-study. Kakati (2003) reduced the limitations of the original study from MacMillan et al. (1987) by introducing two new brackets of characteristics: competitive strategy and resource-based capability. However, the main limitation of Kakati’s (2003) work is its age – it currently dates twelve years ago indicating a need for a new replication study. Another limitation is that the author incorporated qualitative interviews after the respondents had filled out the survey in order to potentially adjust ratings that had upward or downward biases, potentially introducing an interviewer bias. Secondly, as has become apparent in the literature review, previous academic literature is not unanimous in its findings. The two replication studies by Dubini (1989) and Kakati (2003) do not show coherent results: while Dubini (1989) supports the original view established by MacMillan et al. (1987) that the venture team is the most important success factor, Kakati (2003) rejects this proposition. Kakati (2003) introduced the aspects of strategy and resource-based capability in his survey and found out that these two, in addition to the quality of the entrepreneur, are the critical determinants of the firm’s success. Thirdly, none

³ Insights from the qualitative pre-study with a small selection of venture capitalists in Sweden

of these studies apply the methodology introduced by MacMillan et al. (1987) and Kakati (2003) to research the criteria that venture capitalists use when evaluating *digital* ventures. As mentioned previously the digital industry is unique for various reasons, therefore, even though the evaluation criteria have remained relatively unchanged as we observed in our qualitative pre-study, the attached weights to these evaluation criteria may be different. Also, our paper is the only one replicating the aforementioned methodology to approach the different evaluation criteria both from an individual- as well as a group-level point of view, as will become apparent in our hypothesis section (Section 2.5.1).

Therefore, due to the incompleteness and inadequacy of academic research on the specific topic of whether traditional evaluation models still apply or if venture capitalists use a different model for the evaluation of digital start-ups, there is a clear need for further research. This thesis ensures quality through its combination of both qualitative as quantitative research spanning three distinct research phases; an exploratory study, a pre-study, and a main study. In conclusion, given the change of landscape and the fact that much of the applicable literature is dated there is a clear need for new research and data.

2.5. Research Question

2.5.1. Hypotheses Structure

The six hypotheses discussed in the next section are divided into three sets and explore the relation between evaluation criteria venture capitalists use and their relation to venture success in the digital industry. To be more specific, each set of hypotheses consists out of two hypotheses, where the first hypothesis addresses how much emphasis or weight venture capitalists put on the evaluation criterion, or set of evaluation criteria, in their venture evaluation process. The second hypothesis explores what the direct relationship is between this criterion, or set of criteria, and the actual success rate of the start-up. This structure effectively contrasts the current venture capitalist evaluation process when it comes to digital start-ups and the potential best practice in this area (Table 8).

Group-Level Analysis		Individual-Level Analysis	
<u>Hypothesis 1.</u> <i>Characteristics of the venture team</i> carry most weight compared to resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	<u>Hypothesis 3.</u> <i>Customization strategy</i> carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	<u>Hypothesis 5.</u> <i>Global scalability of the business model</i> carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	<i>Weight</i>
<u>Hypothesis 2.</u> <i>Characteristics of the venture team</i> are a predictor of <i>venture performance</i> in the <i>digital industry</i> .	<u>Hypothesis 4.</u> The <i>degree of customization strategy</i> is a predictor of <i>venture performance</i> in the <i>digital industry</i> .	<u>Hypothesis 6.</u> The <i>degree global scalability of the business model</i> is a predictor of <i>venture performance</i> in the <i>digital industry</i> .	<i>Success</i>

Table 8 - Overview of the hypotheses structure

Hypothesis 1 and hypothesis 2 explore a group-level criteria analysis, comparing the grouping of *Venture team characteristics* as a whole against the four other categories, namely *Resource-based capabilities*, *Competitive strategies*, *Product/Service characteristics*, and *Market characteristics*. In contrast, hypothesis 3 to 6 focus on an individual-level criterion analysis. In specific, hypothesis 3 and 4 explore the criterion *Customization strategy*, which is stored under the overarching umbrella of *Competitive strategies*, and hypothesis 5 and 6 explore the criterion *Global scalability of the business model*, which is stored under the *Product/Service* category. The reason for this distinction is that often a high-level view is taken when referred to a best practice, e.g. ‘we consider competitive strategies to be the most important thing when making our investment decision’. By including two levels of analysis, i.e. group-level and individual-level, our research can go one level deeper and not only find out if this statement is supported, but also exactly which strategies contribute to the aforementioned level of support. Does one strategy contribute more than the other? Should individual strategies be isolated and considered separately? Or, is it indeed more relevant to study the overall picture, rather than going more in-depth? By making this distinction we expect to obtain more insight in this apparent dilemma.

Finally, the reason behind why hypothesis 3 and hypothesis 5 both make the assumption that the highest weight will be assigned to that specific criterion, can be explained through the undertermination theory. Most of the evaluation criteria used by MacMillan et al. (1987) and Kakati (2003) are still applicable and relevant to the digital

industry. In each theory a collection of cooperating individual statements exists where some statements are considered more useful and more firmly held than others, i.e. the belief that entrepreneurial team characteristics are related to venture success is firmly grounded in theory and practice. Logically, propositions that belong to the central core of a theory are more firmly held than those which are located closer to the theoretical border where instead rival hypotheses may coexist as mutually incompatible alternatives, i.e. customization strategy and globally scalability of business model appear equally important in venture selection during the qualitative pre-study. Therefore, the qualitative pre-study provides equal amounts of support to infer both hypothesis 3 and hypothesis 5, giving the rival hypotheses a reason to coexist. The rival hypotheses will be untangled through a statistical analysis in later parts of the paper (Section 4.2) (Huck and Zaldar, 1979; Stanford, 2013).

2.5.2. Motivation of Hypotheses

The often cited phrase that an A team with a B idea is more likely to receive funding than a B team with an A idea is backed up by various academic research sources (Roure and Madique, 1986; MacMillan, 1987; Roure and Keely, 1990; Siegel et al., 1993). The actual direct relationship with venture success, however, is a topic up for debate. Baum and Silverman (2004) argue that overall, venture capitalists appear to make a common attribution error in overemphasizing the role of human capital in start-ups in making investment decisions. MacMillan et al. (1987) argue that each successful cluster has a look-a-like class of failures that is very similar except for some flaw in the venture team.

The strong industry focus of venture capitalists on the entrepreneurial start-up team is relatively easy to argue for: it is ultimately the start-up team that selects the strategy, the market, and the product. In other words, the venture team must transform resources into rent achieving capability (Kakati, 2003). However, often a strong venture team alone is not enough to ensure a venture's success. This research argues that for both successful as for unsuccessful start-ups in the digital industry, a higher amount of importance is attached to the characteristics of the venture team than to its four other counterparts (MacMillan et al., 1987; Zacharakis and Meyer, 1998), and, in addition, that the venture team characteristics are a predictor of success in the digital industry (Roure and Madique, 1986; MacMillan, 1987; Roure and Keely, 1990; Siegel et al., 1993; Kakati, 2003).

Hypothesis 1

Characteristics of the venture team carry most weight compared to resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the *digital industry*.

Hypothesis 2

Characteristics of the venture team are a predictor of *venture performance* in the *digital industry*.

A regression analysis conducted by MacMillan et al. (1987) shows that the only consistent predictors of venture success are degree of initial competitive insulation and degree of market acceptance, findings that are backed up by Roure and Madique (1986). When given a second look it is self-evident that the degree of market acceptance and competition are closely related. If one finds multiple competitors active in a market segment, it logically follows that this market segment enjoys demonstrated market acceptance⁴. If there is a demonstrated degree of market acceptance a new venture can partially forgo costs associated with educating potential consumers to use the product. However, because of the relatively low-threshold to enter the digital market it is counter-intuitive that these two previously mentioned factors always lead to a heightened level of venture performance in the digital industry. Therefore this paper argues that initial competitive insulation and degree of market acceptance are no consistent predictors of success in the digital industry, but, given the fast-paced character of the digital industry and the corresponding customer base, the focus should rather lie on the degree of customization strategy, which is according to Kakati (2003) a predictor of venture performance.

Hypothesis 3

Customization strategy carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the *digital industry*.

⁴ Insights from the qualitative pre-study with a small selection of venture capitalists in Sweden

Hypothesis 4

The degree of *customization strategy* is a predictor of *venture performance* in the *digital industry*

The definition of the digital industry encompasses a wide variety of types of firms, ranging from the advertising service Google AdWords, to micro-lending efforts through mobile phones in developing countries such as Africa. However, in order to be successful all these ventures have one thing in common: they need to be globally scalable. As previously stated, the digital industry is different from other industries for numerous reasons, therefore it logically follows that different components of the business model have different levels of importance or are new in their entirety. Based on the qualitative pre-study it was discovered that the global scalability of the business models is key to the success of digital start-ups and was therefore added to our survey under the category product/service characteristics. Including global scalability in the design of a business model competing in the digital industry not only requires a form of simplicity in the user interface and an elegant back-end design in order to facilitate intuitive use around the world, but is accompanied by the challenge to fulfil a universal need. The aforementioned links back to the literature on the ‘born globals’ and resulted in the following hypotheses.

Hypothesis 5

Global scalability of the business model carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the *digital industry*.

Hypothesis 6

The degree of *global scalability of the business model* is a predictor of *venture performance* in the *digital industry*.

3. Methods

This section provides a general overview of the research design (Section 3.1) and data analysis (Section 3.2) selected to carry out this study. Thereafter potential limitations will be discussed (Section 3.3).

3.1. Research Design

This study aims to replicate and extend the research design used by MacMillan et al. (1987) and Kakati (2003). Rather than being limiting to a pure-play qualitative or quantitative design, our deductive multi-method research approach ultimately consists of three distinct steps (Figure 3). First, an explorative research was carried out in order to identify how much research had already been done in the subject area. The results of this initial research were then analysed and checked for applicability to the current digital industry through qualitative in-depth interviews with five different venture capitalists from the Stockholm area. Based on input from both stages, the main study consisting of a survey was constructed and conducted resulting in insightful theoretical and practical contributions. The aforementioned methodological structure is the norm across academic literature on this topic (Khanin, 2006). Before diving into the chosen three-step research design which will be explained in-depth in the following sections, it is important to note that ethical considerations were consistently taking into account during the construction and executing of our research design. A special emphasis was placed on *honesty in all scientific communication*, i.e. honestly report data, results, methods and procedures, *objectivity*, i.e. strive to avoid bias in data analysis, data interpretation, expert testimony, or self, and *confidentiality*, i.e. protect confidential communications (Resnik, 2011).



Figure 3 – Overview of the multi-method research design

3.1.1. Explorative Research

In order to assure that the theoretical knowledge base is as complete as possible all articles were screened following the 5S framework: scoping, systematic search, systematic analysis, structure, and synthesis (Webster and Watson, 2002). Given the extent of literature on venture capitalists, this paper chose to limit the initial sample of empirical studies and key conceptual studies to academics papers where venture capitalists evaluation criteria, decision process, and venture success were significant themes of the manuscript. Further relevance was assured by excluding publications with no original content or research-in-progress. With this pre-selection strategy we aimed at including all publications with substantial contribution, ensuring both breadth as depth in our research, while avoiding an unmanageable sample or inclusion of articles of limited value. In order to achieve this various databases such as Google Scholar, EBSCO, and JSTORE were examined. Key to the collection of relevant research articles was the finding of exact replication studies of MacMillan et al. (1987) in order to ensure that there was a need for a replication study in this specific research.

3.1.2. Pre-study

One of the main differentiating factors in our research design is that our methodology builds upon a qualitative pre-study before distributing the main questionnaire, a practice that was not followed by Dubini (1989) or Kakati (2003). Using a qualitative pre-study before distributing the quantitative questionnaire generates various benefits such as qualitative context, explanation around the quantitative answers, and heightened corporate relevance of research our findings. The pre-study was carried out through interviews with six different venture capitalists from the five largest Swedish venture capitalist firms focusing on the digital industry, i.e. Northzone, SEB, Sting Capital, Industrifonden, and Creandum. This is the same number of interviews MacMillan et al. (1987) conducted, indicating a large enough sample. The five firms that qualified for our qualitative pre-study were selected based on the following criteria: the venture capitalist firm and interviewed venture capitalist invested in ventures that experienced both success and failure and the venture capitalist firm was at least ten years old in order to have gone through trends in the venture capital and digital industry. In the interviews we used a semi-structured approach following the original survey of MacMillan et al. (1987) to identify characteristics that are not applicable to the digital industry and missing characteristics that should be added. Additionally, we asked the venture capitalists to explain what a high or low rating of each characteristic could look like, be caused by, or potentially be misunderstood as.

The data retrieved from the pre-study was analysed through systematically coding in order to be able to compare the inputs from the different interviews with each other. For this purpose every one of the thirty characteristics was tagged with one of the notes *applicable*, *inapplicable*, or *to modify*. Furthermore, the rational process leading to the choice of a specific weight for a venture characteristic was transcribed. Lastly, we tested the previously made statements of interviewees in following interviews with different venture capitalists by specifically asking whether such statement can be assumed to be generally true. Resulting from these in-depth interviews we were able to exclude certain characteristics from the survey due to irrelevance to the digital industry, modify characteristics for understanding reasons and add characteristics in order to consider every important aspect of the investment decision-process in digital ventures. Thus, the retest of the venture

characteristics ensured modern applicability of the criteria and real-life relevance of this academic paper to the corporate world. Even though this study focuses in specific on the digital industry, the pre-study concluded that the selection criteria – not their weight – are cross-industry generalizable.

3.1.3. Main Study

Resulting from the previous two steps the main study was established and conducted. The modifications to the questionnaire, subsequent data collection, and the corresponding sample and respondents will be discussed in the following three sections.

3.1.3.1. Questionnaire Modifications

The original survey design as intended by MacMillan et al. (1987) includes four groups of venture characteristics, namely venture team characteristics, product/service characteristics, market characteristics, and financial characteristics. This set-up was slightly modified and extended by Kakati (2003) by introducing two new brackets, namely resource-based capabilities and competitive strategies, totalling 38 venture characteristics over six groups. The argumentation provided by Kakati (2003) for this modification was that out of the 38 characteristics the study used, successful ventures score significantly higher than unsuccessful venture on 21 criteria, implying that a range of factors influence success, rather than one isolated factor. Therefore, limiting the amount of criteria in measuring venture characteristics and performance may overlook important aspects.

Based on the qualitative pre-studies with venture capitalists and accumulated insights of MacMillan et al. (1987) and Kakati (2003), we have modified the survey to best fit the digital industry and the purpose of this paper. From MacMillan et al. (1987) the categories *Venture team characteristic*, *Product/Service characteristics*, and *Market characteristics* were replicated, and the category *Financial characteristics* was dropped. The reason for the drop is two-fold: according to insights from the pre-study the category was redundant and Kakati (2003) found all results related to financial characteristics to be insignificant. In order to more accurately represent the current needs of the current digital industry an additional question was added to the *Product/ Service characteristics* category, namely the criterion *Business*

model was globally scalable. As previously touched upon, Kakati (2003) extended the questionnaire used by MacMillan et al. (1987) by adding two new categories, namely *Resource-based capabilities* and *Competitive strategies*. Since Kakati (2003) reported significant findings related to both these categories these are correspondingly replicated in our questionnaire, resulting in a total of five meta-categories and thirty questions related to venture characteristics. In their original survey MacMillan et al. (1987) include a qualitative question asking for the age of the venture. In order to be as true as possible to their original survey this question was translated to fit the current reality of the digital industry to *What investment round was the initial investment in.* Since digital companies are ‘born global’ they usually grow rapidly from a very young age, therefore knowing what stage a venture capitalist invested in creates greater comparability than how old the start-up is. The last survey modification is that this study measures venture performance using a five-point likert scale for consistency purposes, as adapted from Kakati (2003), rather than the seven-point likert scale, as adapted from MacMillan et al. (1987).

Based on these categories two sets of questions were constructed – identical except for their instructions. For the two different sets the respondent was asked to rate one of the most successful ventures he or she had funded and one of the least successful ventures he or she had funded.

3.1.3.2. Data Collection Method

Based on the methods used in previous studies that tested similar hypotheses and given our time and resource constraints, a questionnaire was used as the primary data source of our research. A survey is the ideal medium for testing our hypotheses given its flexibility, accessibility, and its ability to allow for a wide range collection and codification of information, thereby strengthening its validity. However, surveys do pose a number of disadvantages. The questionnaire design must be unambiguous and clear as incorrect wording or placement of questions can bias results. Secondly, a common disadvantage of using a questionnaire is the risk of not capturing tacit knowledge. Both issues were countered in our survey design by the inclusion of the qualitative pre-study. The questionnaire and coding methodology bring another advantage in terms of distribution, being easily distributable via electronic channels. The questionnaire is included in Appendix A and the

data collection will be discussed in detail in the result section. Turning toward the measurement method, using a likert scale brings several advantages. Firstly, the likert scale has been acknowledged as a universal method of data collection, therefore making it relatively easy to understand for respondents and minimizes any potential bias in that area. In addition, since a respondent's response is denoted by single numerical response, the data obtained is easily quantifiable and coded.

3.1.3.3. Sample & Respondents

Venture capitalists are globally active and operate in numerous industries. In specific, the population of this study are venture capitalists worldwide that operate in the digital industry. As previously touched upon, the very nature of digital ventures, namely their inherent scalability, allows us to conclude that it does not matter wherefrom the sample originates (Chorev and Anderson, 2005). Therefore, although our sample population originates from Sweden, the Netherlands, and Germany, many of the previously discussed aspects are global – consequently, this study may have broad applicability ensuring eligibility and priority of the sample (Chorev and Anderson, 2005). Under eligibility, the population must be selected from the relevant domain and represent the defined focal unit. Under prioritization, it is deemed more beneficial to select a population in which the effect sizes observed in previous studies can be investigated more exhaustively, thereby contributing to a deeper understanding of the proposed relationship. The sample population was identified in cooperation with the overarching venture capital associations present in each individual country, Swedish Capital and Venture Capital Association (SCVA), Dutch Private Equity and Venture Capital Association (NVP), and German Private Equity and Venture Association (BVK) respectively. For this selection the same criteria applied as for the sample selection in the pre-study in order to safe-guard maturity of data: the venture capitalist firm and interviewed venture capitalist invested in ventures that experienced both success and failure and the venture capitalist firm was at least ten years old in order to have knowledge about what distinguishes the digital industry from its counterparts. Venture capital associations from multiple countries had to be used in order to generate a representative amount of responses despite the rarity of venture capitalists in each country, ensuring feasibility.

In order to generate a well-balanced quota sample, all venture capitalists were asked to fill in the questionnaire for one of their most and one of their least successful ventures. Thereby we made sure to avoid the negativity bias – a better memory of negative occasions consequently leading to results that do not represent the average venture. Another reason why it is important to include the unsuccessful ventures is that no investor would logically invest in a company that he or she expects to fail, therefore when simply asked which characteristics venture capitalists *think* contribute to success, might be something different than the characteristics that *actually* contribute to success. Distinguishing between successful and unsuccessful venture will aid us to delineate the difference.

A digital version of the questionnaire was distributed via email to 150 venture capitalists. A total of twenty-six responses were received which results in a response rate of 17.33%. This is just below the 20% response rate prescribed by Khanin (2006). This a lower result than we initially anticipated, but given the high quality of our sample and given the fact that our target group is fairly narrow, this will be a large enough sample to run our tests. For reference purposes, Kakati (2003) based his study on twenty-seven respondents. In addition, our qualitative pre-study aids us in providing context around the acquired results, allowing for a deep analysis of the obtained results.

3.2. Data Analysis

This paper will conduct a statistical analysis: a systematic collection, analysis, and interpretation of data in order to generate new knowledge. Following the example set by MacMillan et al. (1987) and Kakati (2003), in order to test the hypothesized relationship this paper will use a multiple-regression analysis. For each of the performance characteristics a series of regression analyses will be run based on various venture characteristics. Regression coefficients will be used as effect size parameters. Therefore, the next chapter (section 4.2) will elaborate on whether significant betas were obtained for the proposed relationships, effectively providing evidence for our hypotheses.

Firstly a descriptive statistical model was developed, reporting on the mean and standard deviation based on the findings of the questionnaire.

Secondly, a multiple regression analysis was carried out in order to identify the correlation between the independent characteristics of the ventures and the dependent performance criteria. The significance level was set at 0.05, meaning that the respective coefficient was only taken into account if the p-value of the corresponding independent variable was below 0.05. The multiple regression model tested for multicollinearity between the different independent variables. This multicollinearity test was carried out to avoid that specific values are highly correlated with each other. This would mean that a change in one of the independent variable could trigger a correlated shift in another independent variable resulting in an erratic and irregular change of the dependent coefficient. The results exposed a very low multicollinearity between the independent variables. No factors could be observed causing the exclusion of a factor analysis in our study. A table showing the multicollinearity between the different variables is presented in Appendix B.

Contrary to early practices by MacMillan et al. (1987), Dubini (1989), and Kakati (2003) it was decided not to conduct a cluster analysis. Firstly, the prospective results would not add to our hypothesis. Secondly, the main reason why MacMillan et al. (1987) used a cluster analysis was to address the heterogeneity of their sample, something that is not applicable for our homogeneous sample of the digital industry.

Lastly, this study defines venture performance solely through the seven different performance criteria that were selected as dependent performance variables of the survey, i.e. sales, market share, profit, costs, and ROI. This contradicts the method used in previous studies of MacMillan et al. (1987), Dubini (1989), and Kakati (2003), which drew conclusions about characteristics that lead to success based on the absolute differences between the “most successful venture” and “least successful venture” ventures, whereas our study consolidates successful and unsuccessful ventures to one mean and one standard deviation and draws conclusions only from the comparisons with the dependent performance variables previously mentioned. By only looking at the performance criteria to define success – therefore explicitly defining success only by these unambiguous criteria – we reduce the limitation of divergent definitions of successful and unsuccessful ventures as observed in the previously mentioned studies. This further implies that the need for a t-test is eliminated as the significance of the differences between the answers of the successful and unsuccessful

venture section are of no importance since both sections are merged, resulting in a sample replicating an average venture which can turn out successful or unsuccessful.

3.3. Potential Limitations

As outlined by MacMillan et al. (1987) in their research paper there are some points of critique with replicating their research design. Firstly, responding venture capitalists decided what a successful or unsuccessful venture was according to their own definitions. In order to reduce this bias our research addressed this concern during the pre-study phase by asking five venture capitalists to define what a successful or unsuccessful venture was to them. In general the definition of success was associated with getting a positive return on investment, with usual outcomes ranging between three to five times return on investment at the lower end, to twenty to thirty times return on investment at the high end for extremely successful ventures. It was unanimously agreed upon that an unsuccessful venture is defined in a worst-case scenario as zero return on investment, and in a best-case scenario as only just recouping the initial investment. Furthermore, our research design limits the bias even further by solely distinguishing between successful and unsuccessful venture in the survey for the purposes of creating a well-balanced sample and uses the three objective performance group criteria, i.e. revenue, costs, and profits to determine if a venture was successful or not. The second point of criticism is that venture capitalists were asked to give a posteriori rating rather than a priori rating, therefore there is potentially a hindsight bias present, meaning that successful ventures are ranked higher and unsuccessful ventures lower than reality would reflect (Roesse and Vohs, 2012). Given this research asks for both a successful and an unsuccessful example, taking an average venture is expected to cancel out the variation and give an accurate representation of a random venture. By purely focusing on the digital industry this research also replies to the third point of criticism MacMillan et al. (1987) raised, namely that the amount of heterogeneity in the venture capital community impedes on the ability to distinguish patterns in the data results.

A potential limitation in terms of measurement protocol is the one-dimensional character of likert scale, limiting the range of attitudes of respondents. Additionally, respondents might tend to gravitate towards extreme options, or contrarily may avoid these

extremes, resulting in a potential extreme aversion bias. During the qualitative pre-study this limitation was reduced by asking venture capitalists to elaborate on their survey responses and place them in a qualitative context. A potential drawback of using a questionnaire could be that the design is not unambiguous or clear as incorrect wording or placement of questions can bias results. However, the qualitative pre-tests made sure that this bias was not present. Also, the motivation and honesty of respondents must be considered and examined with caution. This is especially relevant in the venture capital industry where venture evaluation criteria are a critical part of the competitive advantage of a venture capital firm. Another potential limitation in relation to the measurement protocol is the unequal scale of the survey design (Figure 5). While determining our research design we were aware of this limitation and consciously decided against the modification because we wanted to stay as true to the original replication study of MacMillan et al. (1987) and Kakati (2003) as possible. However, future research could avoid this bias by evening out the scale through a neutral instead of the slightly positive description of the medium scale value 3.

0	1	2	3	4	5
Did not apply to venue	Extremely poor	Poor	Satisfactory	Highly satisfactory	Outstanding

Figure 4 Measurement protocol – five point likert scale with unbalanced values

Lastly, there is fundamental limitation resulting from the research being based on interviews and surveys. Post-hoc interviews and questionnaires are opposed to the recall bias that describes the differences between the reality and the recalled situation (Zacharakis and Meyer, 1998). Hence, venture capitalists will not exactly know their decision-making process and therefore unintentionally give wrong answers to our research survey. As this is a natural effect from analysing past events, this error is inherent to this type of research.

4. Results

This section lists relevant descriptive statistics (Section 4.1) and the results of the multiple-regression model (Section 4.2) related to the six hypotheses. Other interesting findings that can be derived from the figures presented in the tables 9 to 12 that are not directly related to the six hypotheses will be postponed to the discussion (Section 5).

4.1. Descriptive Statistics

The average means of the five main meta-categories are reported on in Table 9. The categories *Resource-based capability* and *Competitive strategy* are the two categories with the highest mean weights of 3.64 and 3.74 respectively. The next most important ranked category is *Product/ Service characteristics* carrying a weight of 3.63. Only undercut by the weight of *Market characteristics* (3.03) and *Venture team characteristics*, which is with the characteristic with the second lowest weight therefore **rejecting H1**.

Weighted characteristics on five-point scale	
Competitive Strategy	3.74
Resource-based capability	3.64
Product/ Service characteristics	3.63
Characteristics of venture team	3.60
Market characteristics	3.03

Table 9 – Mean weights of the meta-categories of venture characteristics

The means and standard deviations of the participants' responses regarding the weight of thirty independent variables are displayed in Table 10. The average of successful and unsuccessful ventures is collapsed into one combined mean and one combined standard deviation. The ability of a venture creating a new market is with a weight of 2.40 the least important single factor. *Customization strategy* ranks with an average weight of 3.36 ninth last consequently **rejecting H3**. The data show that the criterion *Business was globally scalable* is the single most important characteristic (4.54) of ventures in the digital industry, thus **supporting H5**.

Weighted characteristics on five-point scale		Successful Venture	Unsuccessful Venture	Random Venture	σ
Characteristics of the venture team	Familiarity with the market targeted by the venture	4.19	3.40	3.80	0.82
	Track record that was relevant to the venture	4.31	3.05	3.68	0.77
	Ability to articulate well when discussing venture	4.12	3.21	3.67	0.83
	Personal compatibility with me	4.05	3.20	3.63	1.56
	Degree of leadership ability demonstrated in the past	4.42	2.83	3.63	0.94
	Capacity for sustained and intense effort	4.38	2.82	3.60	0.86
	Attention to detail	3.96	3.22	3.59	0.92
	We were already familiar with the venture team's reputation	3.10	4.00	3.55	1.68
	The venture was referred to us by a trustworthy source	3.85	3.00	3.43	1.47
	Ability to evaluate and react well to risk	4.19	2.64	3.42	0.82
Resource-based capability	Technical capability	4.46	4.04	4.25	0.71
	Marketing capability	4.04	3.02	3.53	0.82
	Input-sourcing capability	3.69	3.33	3.51	0.85
	Managerial capability	3.88	2.67	3.28	0.87
Competitive strategy	Innovation strategy	4.50	3.67	4.09	0.70
	Quality strategy	4.35	3.69	4.02	0.69
	Cost strategy	4.00	3.00	3.50	0.76
	Customization strategy	4.04	2.68	3.36	0.85
Product/ Service characteristics	Business model was globally scalable	4.65	4.42	4.54	0.63
	Product developed to the point of functioning prototype	4.23	3.22	3.73	0.90
	The product was "high tech"	3.42	3.50	3.46	0.98
	Protection of product	3.00	3.65	3.33	0.83
	The product enjoyed demonstrated market acceptance	3.42	2.82	3.12	0.66
Market characteristics	Target market enjoying a significant growth rate	4.60	4.10	4.35	1.79
	An existing market would be stimulated	4.05	3.05	3.55	1.57
	Well-established distribution channel	2.90	3.20	3.05	1.24
	If "yes", did the venture team have access to it?	4.25	1.25	2.75	1.29
	Competition present or anticipated in first two years	3.25	2.10	2.68	1.22
	Venture in an industry with which we are familiar	3.85	1.00	2.43	1.03
	The venture could create a new market	1.90	2.90	2.40	1.29

Table 10 – Descriptive statistics of venture characteristics

4.2. Regression Model

All significant betas at the significance level of 0.05 are reported in Table 11 and 12. When looking at the correlation between entire categories and performance criteria in Table 11, it shows that *Venture team characteristics* correlate positively to the performance variable *Marketing costs* with a β of 0.771, hence **supporting H2**.

	Sales	Market Share	Marketing Costs	Production Costs	General & Administrative Costs	Profits	ROI
Characteristics of the venture team	0.771						
Resource-based capability			0.798		0.910		
Competitive strategy							1.138
Product/ Service characteristics							
Market characteristics							

Table 11 – Correlation between meta-categories and performance criteria

The data in Table 12 shows that no consistent predictor of success appears to be present. However, the criteria *Customization strategy* reports a β of 0.521 on the performance variable ROI, **supporting H4**. In addition, the criteria *Business model was globally scalable* reports similar results with a β of 0.47, in effect untangling the rival hypothesis and **supporting H6**.

	Criteria with significant correlation coefficients (β)	Sales	Market Share	Marketing Cost	Production Cost	G&A Cost	Profit	ROI
Characteristics of the venture team	Track record that was relevant to the venture					0.674		0.592
	Capacity for sustained and intense effort.		0.530					
	Degree of leadership ability demonstrated in the past			0.491				
	Personal compatibility with me							
	Market familiarity				0.429			
Resource-based capability	Managerial capability					0.676		
	Input-sourcing capabilities					0.430		
Competitive strategy	Customization strategy							0.521
	Quality Strategy		0.423					
	Innovation Strategy				0.593			
Product/ Service characteristics	Product developed to the point of functioning prototype			0.398		0.513		0.384
	Business model was globally scalable							0.470
	The product was “high tech”		0.408				0.584	
	Protection of product							
Market characteristics	Well-established distribution channel					0.682	1.030	
	Access to distribution channel							
	Competition present or anticipated in first two years		-0.598					
	An existing market would be stimulated							
	R-square		0.486	0.201	0.345	0.473	0.431	0.479

Table 12 - Correlation between venture characteristics and performance criteria

The relatively high R-square values imply that the selected characteristics are to a large extent the reason for the ventures’ successes as shown in the performance measures. A similar pattern was observed in Kakati (2003). On the contrary, various former studies such as MacMillan et al. (1987) and Dubini (1989) that did not include the categories *Resource-based capabilities* and *Competitive strategy*, found relatively low R-squared values.

Table 13 provide an overview of which hypotheses were rejected and which ones were supported based on the aforementioned figures.

Hypothesis		Result
H1	<i>Venture team characteristics</i> carry most weight compared to resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	Rejected
H2	<i>Venture team characteristics</i> are a predictor of <i>venture performance</i> in the <i>digital industry</i> .	Supported
H3	<i>Customization strategy</i> carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	Rejected
H4	The degree of <i>Customization strategy</i> is a predictor of <i>venture performance</i> in the <i>digital industry</i>	Supported
H5	<i>Global scalability of the business model</i> carries most weight compared to other individual components of venture team characteristics, resource-based capabilities, competitive strategies, product/service characteristics, and market characteristics, in venture capitalist evaluation of ventures in the <i>digital industry</i> .	Supported
H6	The degree of <i>scalability of the business model</i> is a predictor of <i>venture performance</i> in the <i>digital industry</i> .	Supported

Table 13 – Overview of rejection and support of hypotheses

5. Discussion

This section first discusses findings in relation to our hypotheses (Section 5.1) before elaborating on findings of other managerial and theoretical relevance (Section 5.2). The section will be concluded by discussing fields of future research (Section 5.3).

5.1. Discussion of Findings in Relation to Hypotheses

The findings in relation to the hypotheses are split in up in two sections, namely descriptive statistics, addressing hypothesis H1, H3, and H5, and multiple-regression analysis, addressing hypothesis H2, H4, and H6.

5.1.1. Descriptive Statistics

Just as every athlete has his or her own strategy to win a competition, every venture capitalist has its own strategy to select the goose with the golden eggs amongst potential investments. In her research Dubini (1989) identifies four different types of investors and their corresponding strengths and weaknesses, leading to the assumption that also in our data set different types of investment strategies are at play.

The urge – and necessity – of venture capitalists to remove uncertainty and reduce risk in an often speculative and overcrowded digital industry is understandable. The common tendency in the venture capital industry when aiming for risk reduction is to turn towards the venture team. As in frequency cited in previous academic research venture capitalists prefer an A team with a B idea. But is this truly the case? Reporting a mean of 3.60, effectively placing fourth out of five on the ranking list and rejecting *H1*, the *Venture team characteristics* do not enjoy the level of importance as previously assumed. This directly challenges the assumptions made by previous scholars (Roure and Madique, 1986; MacMillan, 1987; Zacharakis and Meyer, 1998; Roure and Keely, 1990; Siegel et al., 1993). An A team with a B idea is *not* more likely to receive funding than a B team with an A idea. There is a difference between the necessary conditions for success versus sufficient conditions for success (Kakati, 2003). Intuitively, no venture capitalist will back a venture where the entrepreneur or venture team is clearly lazy, lacking managerial skills and vision, and does not have a passion for his or her own business. However, it is also true that ventures can still

fail no matter how hard the venture team works, how charismatic and visionary leaders they are, or how much they believe in their own idea – such team characteristics may be necessary for success but on their own they are not sufficient. It should be taken into account that the venture team, the venture's strategy and its capabilities, the product, and the market conditions, all work in synch with each other and should complement, rather than replace, one another. In addition, it appears more important whether the venture team is familiar with the market (3.80) than if the venture capitalist firm is familiar with the market (2.43). This directly connects to theory developed by Baum and Silverman (2004), who state that the dual-role of the venture capital as both 'scout' and 'coach' blurs the lines between 'making' versus 'picking' winners. This finding stresses the need for an autonomous and independent venture team.

Surprisingly, *Customization strategy* carries a relatively low weight (3.36). An explanation for this originates from the qualitative pre-study; as complete customer customization is not feasible in early stages of a young venture for cost and complexity reasons, ventures should first understand the hygiene limits of customization customers are minimally satisfied with, before committing to implement a full customization strategy. Therefore, it is plausible that a customization strategy does not carry much weight in initial investment decisions by venture capitalists.

The unique character of the digital industry is reflected in high weighting of the criteria *Business model was globally scalable* (4.54), *Technical capability* (4.25), *Innovation strategy* (4.09), and *Target market enjoying a significant growth rate* (4.35). The fact that *Business model was globally scalable* is given the highest weight across the board illustrates *H5*. The need for technical expertise and expertise in product development is closely linked to the high-tech nature of the digital industry. Furthermore, innovation is a key driver for the digital industry, for many products that dominate the market today were not even invented little over ten years ago, for example the mobile photography application Instagram. The constant strive for digital players to invent new markets, combined with the global scalability of business models of digital start-ups could potentially mean an overnight success – or failure – of the venture in question. A phenomenon that created, e.g. the video streaming

site YouTube, or broke, e.g. the social media site MySpace, some of the most famous digital enterprises known today.

The previous section provides insight in if it is indeed more relevant to study the overall picture, rather than going more in-depth by distinguishing between group- and individual criteria. Even though both approaches certainly bring benefits, if dissection of a concept is possible it is advisable to research individual-level criteria given it is easier to isolate measurable factors and hence to explore the link between these individual criteria and success, both in theory as in practice.

5.1.2. Multiple Regression Analysis

Various academic authors stress that the actual relationship between venture team characteristics and success is debated (Roure and Madique, 1986; MacMillan, 1987; Zacharakis and Meyer, 1998; Roure and Keely, 1990; Siegel et al., 1993; Kakati, 2003). Gripping back to the hypothesis of MacMillan et al. (1987), each successful cluster has a look-a-like class of failures that is very similar except for some flaw in the venture team. This is an apt illustration of the delicacy of identifying the right balance in the venture team. Overall it was found that *Venture team characteristics* as a whole is a predictor of the performance variable *Marketing costs*, thereby giving meaning to the support of *H2*. However, even though *H2* is supported, it should be taken into account that findings from our qualitative pre-study indicated that *Marketing costs* is not the most important performance variable, but rather *Return on investment*. Therefore these findings should be approached with caution even though they are statistically significant. Also, it should be noted that *Venture team characteristics* is no consistent predictor of venture performance, for it only has statistically explanatory value for one variable.

In this ever globalizing and personalizing world business models that leverage the power of mass customization often prevail, such as the customizable online news website Pulse. By letting customers only pay for the services they actually want, the probability of customer satisfaction and favourable margin increases, potentially linking the criterion *Customization strategy* and *ROI*, effectively supporting *H4*. Interestingly, since *H3* is rejected

customization strategy is not aptly weighted given its significant relation with venture success, signalling a potential new best managerial practise for venture capitalists.

In line with customization strategy, the criterion *Business model was globally scalable* also is a predictor of the performance variable *ROI*, underlining *H6*. In addition to argumentations raised in the aforementioned literature, one of the explanations for this correlation could be that the monetary threshold to invest in the digital industry has decreased over the past decades, combined with the global scalability component of start-ups which brings potential for quick intercontinental expansion so the risk premium could be quickly offset by the corresponding return on investment. Consequently, an increased global scalability inherent to the business model increases the chance for a better deployment of return on investment.

5.2. Discussion of Additional Findings

The regression analysis generated several more interesting discussion points that go beyond the presumed hypotheses. These will be discussed in the following sections; the first section discusses findings that add to the existing literature, while the second section gives explicit recommendations to venture capitalists.

5.2.1. Theoretical Implications and Contributions

When taking a holistic view it becomes apparent that overall venture capitalists place most emphasis on competitive strategies (3.74), closely followed by the resource-based capability category (3.64), justifying Kakati's (2003) extension of MacMillan's (1987) survey. A closer look at the exact definition of resource-based capabilities and competitive strategies sheds light on why venture capitalists would assume a potential relationship between these categories and a competitive advantage of a start-up. Resource-based capabilities represent the *capabilities* rather than the *characteristics* of a venture team. In effect, this proves what a venture team is capable of, instead of criteria measuring its status quo. In contrast, competitive strategies do not only highlight the differentiating factors of the venture, namely its strategy and hence competitive position, but also inform its investor about the venue's identity and where it stands for. Considering that this is the first research paper that tests

Kakati's (2003) proposed categories, the strong results signal a clear recommendation to other researchers, arguing for the inclusion of these categories in future research. Furthermore, these findings also raise the question if more categories exist that would be a complementary addition to the five existing categories included in our thesis.

Turning to the multiple-regression analysis, the negative relation between the criterion *Competition present or anticipated in the next two years* against the performance criteria *Markets share* (β -0.598) is in line with the results of Roure and Maidique (1986) and Macmillan et al. (1987) and can be explained as competition naturally decreases the market share. Another theoretical implication that flows out of the multiple-regression analysis is the observation that general and administrative costs are improved by *Managerial capability* (β 0.676) and *Input-sourcing capability* (β 0.430). Intuitively, a well-equipped manager will aim to reduce costs to the bare minimum and does not waste funds. In addition a high level input-sourcing capability, defined as access to low cost of capital and skilled labour, is bound to keep the costs low.

As previously mentioned venture capitalists aim to minimize risk in their investments. A so-far in theory completely undiscovered aspect is shown in the results of the survey; digital starts-ups do not merely need to provide an idea, but rather a form proof or assurance that this idea can be turned into a viable business in the form of a functioning prototype or a relevant track-record of the entrepreneurial team in relation to the venture. The reason for this observation likely lies in the large amount of digital ideas that never turn into a successful product, e.g. the mass of applications in various mobile app stores that have less than one thousand downloads or twenty reviews and slowly go out of business due to lack of exposure. The criterion *Product developed to Functioning prototype* comes closest of all criteria to be a consistent predictor of performance with statistically significant relations with the performance criteria *Marketing Costs* (β 0.398), *General and administrative costs* (β 0.513), and *ROI* (β 0.384). The digital space is unique in that often products or services are distributed to clients in beta-form in order to be one of first players on the market and to gather valuable customer feedback. In order to engage in this practice a firm needs a functioning prototype. In addition, a *Relevant track-record to venture* signals that a team that has been successful before is, more than a team without to a relevant track-record, likely to

be successful again. In the market there are numerous examples that underline this assumption, for example the creators of the original mobile keyboard software T9 used on the old Nokia phones developed the upgraded smartphone version of mobile keyboard software in the form of Swype only a few years later.

5.2.2. Managerial Implications and Contributions

Firstly, the relatively high beta values attached to the independent variable *Well-Established distribution channel* call for a more in-depth look at the results. Here it is important to note that the distribution is an integral part of the business model of a digital venture, i.e. website or application. A well-established distribution channel, such as a website, does not only imply that the customer is relatively educated about using the product, but it also means that there is a large potential reach among the target group in question. In addition, the positive influence on *General & administrative costs* (β 0.682) can be explained by the foregone costs of setting up a distribution channel for a new firm on its own. Therefore, a managerial implication is that a well-established distribution channel plays a central part in a balanced and well-functioning business model of a successful digital start-up. When taking a website as an exit point a well-established distribution channel can take the form of an effective information flow towards your customer, calling for a clean user-interface, transparency, and an intuitive design, whereas when taking the form of physical product delivery the focus should rather lie on delivery time and product quality. When taking another example out of the digital industry, such as a mobile phone application, a high-ranked position in the important app stores is essential for a swift adaption of users, highlighting the diversity in distribution channels in the digital industry. These factors should be taken into account when venture capitalists make their investment decisions.

Another criterion that influences market share is *Quality strategy* (β 0.423). Often a service or product that uses the Internet as their main component offers the service or product for a freemium model, i.e. a 30-day trial such as the software provider Adobe, or a free basic package that can be upgraded for a price premium such as the career website LinkedIn. Other examples of firms successfully engaging in this practice are the music provider Spotify, the cloud computing service Dropbox, or the mobile game application

CandyCrush. It is essential that at the first customer touch point, also commonly called the ‘first moment of truth’, the service or product proves itself to be superior in fulfilling a real need and score high in ease of use. It is dangerous for a company to lose a client in the digital space for there are many competitors lurking around the corner and the network effect will cause a snowball effect if users start leaving your platform. Thus, if venture capitalists aim for a high market penetration from the very beginning, the *Quality strategy* should be closely evaluated.

Turning to the performance variable *Production costs*, this cost component appears to be reduced by funding a venture team with *Market familiarity* (β 0.429) and a venture following an *Innovation strategy* (β 0.593). Familiarity with the market indicates that the team has experience with what does and what does not work in the market, potentially leverage useful connections, and can make educated assumptions about the costs structure. In addition, an innovative approach is essential for progress and allows for cost savings through a consistent practise of creating innovative breakthroughs. So, even though it seems contradictory at the first glance, venture capitalists should invest in firms with well-developed innovation strategies in order to keep production costs low.

Lastly, in high-technology intensive firms margins often are higher, potentially explaining the strong correlation between *Product High-Tech* and *ROI* (β 0.584). In addition, since these high-tech products often serve a niche market it is relatively easier for a start-up venture to obtain a higher *Market share* (β 0.408) due to the limited amount of competitors. The combination of high margins and high market share leads to the observed likelihood of highly satisfactory profits. For venture capitalists this means that high-technology firms often have the potential to become a very satisfying return despite operating in rather small niche markets.

5.3. Potential for Future Research

The different dimensions to explore around the topics of venture capitalists evaluation criteria, the digital industry, and venture success are numerous. A brief selection will be discussed in the next section.

The first implication for future research that can be derived from this study is that the existence of a working prototype might be the closest to a consistent predictor of success in the digital industry. This is an interesting area for future research for what does the concept of a 'prototype' effectively mean in the digital industry? Due to the intangibility of many digital products it might mean that developing a working prototype will require an extensive investment in research and development. It might also mean that few versions before a beta-version exist, for in order to products to be operational in the digital industry, often a high degree of complexity is required. Therefore, future studies should look more closely at the dimensions and even alternatives to proof of concept in the digital industry, and their respective relationship with success.

Except for MacMillan et al. (1987), who argue that initial competitive insulation and degree of market acceptance are consistent predictors of venture success; to our knowledge no other academic paper identified a consistent predictor of venture success, let alone in the digital industry. This effectively raises the question: do consistent predictors of success exist in the realm of digital start-ups? The industry encompasses a wide array of different products and services, ranging from mobile game applications to cloud computing, and from social media networks to video streaming websites. Despite narrowing down the analysed industry to the digital industry, this might still be too wide, consequently raising the assumption that the industry might be too wide to have one generalizable consistent predictor of performance. That being said, the inclusion of more evaluation criteria might extend this study (Kakati, 2003). Considering the unique character of the digital industry it would be interesting to research if other categories exist that would explain more variance in the identified performance criteria. Based on our findings thus far, future studies are advised to extend our adapted version of the survey, i.e. to drop financial characteristic and include the criteria global scalability of the business model.

Digital ventures are infamous for their high valuation in a pre-revenue state, e.g. the social media site Twitter is valued at 18 billion dollar in 2013, has 232 million monthly active users, and is not profitable – yet (Twitter, 2013). Adding to this, success for venture capitalists is measured in return on investment and exit potential, raising the question if the performance criteria used in our paper are perhaps outdated. An alternative to measure

venture success in the digital industry could be exploring the link between the last financing round of a venture and the subsequent valuation of the venture. Taking the funding cycle of Facebook as an example, the company started with a 500,000 dollar Angel investment in 2004 that turned into a 3% share worth 1.5 billion dollar in 2011 (Caulfield and Perlroth, 2011). This example illustrates that digital ventures can grow explosively and their market valuation does not always reflect the value that can be derived from their books, but rather reflects the potential of the venture. This dilemma invites for further research.

Putting the topic in an even broader perspective, this paper can be extended by researching if venture capitalist evaluation criteria for digital start-ups differ after the early seed and A-investment phase, i.e. the expansion phase. In these later phases ventures will explore different funding channels than in the Seed or A phase, where the main options are family and friends, venture capitalists, or business angels. Examples of players in the later phases are equity growth funds, traditional banking, and venture capitalists. The introduction of new funding competitors in combination with a different future prospect for the venture that is looking for investment makes that venture capitalist might look for different evaluation criteria when it comes to digital start-ups, or weight these criteria differently. It could also prove interesting researching which criteria venture capitalists look at when deciding to engage in a follow-up investment. When it comes to follow-up investment decisions different motivation might be at play and also different stakeholders will most likely be involved.

In order to ensure an even higher degree of corporate applicability and real life relevance it could be interesting to follow the line of research that Dubini (1989) initiated two decades ago: trying to identify types of strategic investors and developing corresponding advice. By identifying investment patterns and the advantages and disadvantages of each method, a more customized advice can be provided to venture capitalists. In order to explore this topic, a sufficiently large sample should be used after which a cluster analysis should be conducted identifying the different investor clusters and their corresponding characteristics.

Overall it can be concluded that despite this extensive study, there are still many interesting dimensions of ventures in the digital industry that can, and should be, explored.

6. Concluding remarks

This final chapter will conclude the thesis by addressing the core of our thesis and aims to answer questions previously raised in relation to our research objectives.

Do traditional venture capitalist evaluation models still apply when evaluating ventures in the digital industry? In short, the internet-centred digital industry *is* different from its more traditional counterparts. This study closed the identified knowledge gap by applying a three-phase research methodology, thereby resulting in both managerial and theoretical contributions that will improve the understanding of the unique character of digital ventures. Academic literature, complemented by a qualitative pre-study to ensure managerial relevance and real world applicability, indicated that most of the original evaluation characteristics introduced by MacMillan et al. (1987) still apply today, but the weighting of these criteria has changed. However, during the qualitative pre-study new evaluation characteristics became apparent, such as the criterion measuring the global scalability of a business model; these criteria were subsequently added to the questionnaire, tested and measured.

The unique character of the digital industry was further illustrated by different criteria – compared to previous academic studies – that delineated the actual relationship with venture success, such as the existence of working prototype, customization strategy, and the presence of a well-established distribution channel. Surprisingly, despite being a proven success factor, the customization strategy plays no important role in the investment decisions of venture capitalists. On the other hand it was identified that the scalability of the business model was the most important single characteristic of ventures in the eyes of venture capitalists. Lastly, this study showed that the venture team is not an as important decision factor as previously assumed.

To conclude, this study found that the digital industry requires an extended version of the traditional venture capitalist evaluation model and has set the first steps in the right direction in order to create this new model. Given the relevance and appeal of this industry, various further studies exploring this research area can be expected in the coming years.

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Appendix A: Questionnaire

Venture 1: One of the most successful ventures. Rate the venture on the following characteristics:

	0 <i>Did not apply to venue</i>	1 <i>Extremely poor</i>	2 <i>Poor</i>	3 <i>Satisfactory</i>	4 <i>Highly satisfactory</i>	5 <i>Outstanding</i>
<i>Part 1: Evaluation characteristics</i>						
<i>1. Characteristics of the venture team</i>						
1.1. Capacity for long-term commitment	0	1	2	3	4	5
1.2. Ability to evaluate and react well to risk.	0	1	2	3	4	5
1.3. Ability to articulate well when discussing venture.	0	1	2	3	4	5
1.4. Attention to detail.	0	1	2	3	4	5
1.5. Personal compatibility with me.	0	No	Yes			
1.6. Familiarity with the market targeted by the venture.	0	1	2	3	4	5
1.7. Degree of leadership ability demonstrated in the past.	0	1	2	3	4	5
1.8. Track record that was relevant to the venture.	0	1	2	3	4	5
1.9. We were already familiar with the venture team's reputation.	0	No	Yes			
1.10. The venture was referred to us by a trustworthy source.	0	No	Yes			
<i>2. Resource-based capability</i>						
2.1. Managerial capability	0	1	2	3	4	5
2.2. Technical capability	0	1	2	3	4	5
2.3. Marketing capability	0	1	2	3	4	5
2.4. Input-sourcing capability	0	1	2	3	4	5
<i>3. Competitive strategy</i>						
3.1. Quality strategy	0	1	2	3	4	5
3.2. Cost strategy	0	1	2	3	4	5
3.3. Innovation strategy	0	1	2	3	4	5
3.4. Customization strategy	0	1	2	3	4	5
<i>4. Product/Service characteristics</i>						
4.1. Protection of product.	0	1	2	3	4	5
4.2. The product enjoyed demonstrated market acceptance.	0	1	2	3	4	5
4.3. Product developed to the point of functioning prototype.	0	1	2	3	4	5
4.4. The product was "high tech".	0	1	2	3	4	5
4.5. Business model was globally scalable.	0	1	2	3	4	5
<i>5. Market characteristics</i>						
5.1. Well-established distribution channel.	0	No	Yes			
5.1.1. If "yes" to 3.1, did the venture team have access to it?	0	No	Yes			
5.2. Target market enjoying a significant growth rate.	0	No	Yes			
5.3. An existing market would be stimulated.	0	No	Yes			
5.4. Venture in an industry with which we are familiar.	0	No	Yes			
5.5. Competition present or anticipated in first two years.	0	No	Yes			
5.6. The venture could create a new market.	0	No	Yes			

Which investment round was the initial investment in?

	<i>Seed</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
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Please rate the venture on its performance in each of the following categories. 'Satisfactory' means meeting projection states in plan.

	0 <i>Did not apply to venue</i>	1 <i>Extremely poor</i>	2 <i>Poor</i>	3 <i>Satisfactory</i>	4 <i>Highly satisfactory</i>	5 <i>Outstanding</i>
<i>Part 2: Performance characteristics</i>						
1. Sales	0	1	2	3	4	5
2. Market share of served market	0	1	2	3	4	5
3. Costs						
3.1. Marketing	0	1	2	3	4	5
3.2. Production	0	1	2	3	4	5
3.3. General and administrative	0	1	2	3	4	5
4. Profits	0	1	2	3	4	5
5. ROI	0	1	2	3	4	5

Venture 2: One of the most unsuccessful ventures. Rate the venture on the following characteristics:

	0 <i>Did not apply to venue</i>	1 <i>Extremely poor</i>	2 <i>Poor</i>	3 <i>Satisfactory</i>	4 <i>Highly satisfactory</i>	5 <i>Outstanding</i>
<i>Part 1: Evaluation characteristics</i>						
<i>1. Characteristics of the venture team</i>						
1.1. Capacity for long-term commitment	0	1	2	3	4	5
1.2. Ability to evaluate and react well to risk.	0	1	2	3	4	5
1.3. Ability to articulate well when discussing venture.	0	1	2	3	4	5
1.4. Attention to detail.	0	1	2	3	4	5
1.5. Personal compatibility with me.	0	No	Yes			
1.6. Familiarity with the market targeted by the venture.	0	1	2	3	4	5
1.7. Degree of leadership ability demonstrated in the past.	0	1	2	3	4	5
1.8. Track record that was relevant to the venture.	0	1	2	3	4	5
1.9. We were already familiar with the venture team's reputation.	0	No	Yes			
1.10. The venture was referred to us by a trustworthy source.	0	No	Yes			
<i>2. Resource-based capability</i>						
2.1. Managerial capability	0	1	2	3	4	5
2.2. Technical capability	0	1	2	3	4	5
2.3. Marketing capability	0	1	2	3	4	5
2.4. Input-sourcing capability	0	1	2	3	4	5
<i>3. Competitive strategy</i>						
3.1. Quality strategy	0	1	2	3	4	5
3.2. Cost strategy	0	1	2	3	4	5
3.3. Innovation strategy	0	1	2	3	4	5
3.4. Customization strategy	0	1	2	3	4	5
<i>4. Product/Service characteristics</i>						
4.1. Protection of product.	0	1	2	3	4	5
4.2. The product enjoyed demonstrated market acceptance.	0	1	2	3	4	5
4.3. Product developed to the point of functioning prototype.	0	1	2	3	4	5
4.4. The product was "high tech".	0	1	2	3	4	5
4.5. Business model was globally scalable.	0	1	2	3	4	5
<i>5. Market characteristics</i>						
5.1. Well-established distribution channel.	0	No	Yes			
5.1.1. If "yes" to 3.1, did the venture team have access to it?	0	No	Yes			
5.2. Target market enjoying a significant growth rate.	0	No	Yes			
5.3. An existing market would be stimulated.	0	No	Yes			
5.4. Venture in an industry with which we are familiar.	0	No	Yes			
5.5. Competition present or anticipated in first two years.	0	No	Yes			
5.6. The venture could create a new market.	0	No	Yes			

<i>Which investment round was the initial investment in?</i>	<i>Seed</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
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Please rate the venture on its performance in each of the following categories. 'Satisfactory' means meeting projection states in plan.

	0 <i>Did not apply to venue</i>	1 <i>Extremely poor</i>	2 <i>Poor</i>	3 <i>Satisfactory</i>	4 <i>Highly satisfactory</i>	5 <i>Outstanding</i>
<i>Part 2: Performance characteristics</i>						
1. Sales	0	1	2	3	4	5
2. Market share of served market	0	1	2	3	4	5
3. Costs						
3.1. Marketing	0	1	2	3	4	5
3.2. Production	0	1	2	3	4	5
3.3. General and administrative	0	1	2	3	4	5
4. Profits	0	1	2	3	4	5
5. ROI	0	1	2	3	4	5

Appendix B: Multicollinearity

Well-established distribution channel	100%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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