Master's Thesis – master Innovation Sciences:

The influence of resource acquisition timing on nascent venture performance

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Abstract

Introduction

The venture creation process is, after decades of studies, still a process wrought with failure. The majority of research done in this field relies on static measurements of variables that influence the performance of nascent ventures. As a result there is a lack in understanding of how the timing of resource acquisition influences the performance of ventures. This study aims to address that gap in literature and test how the timing of resource acquisition influences nascent venture creation speed and growth.

Theory

The focus lies on resources since those influence the performance of firms according to the Resource Based View. Ventures develop value-creating strategies based on the resources that are available to them. Two key types of resources in nascent ventures are human and capital resources. Human resources encompass the founders, employees and service providers that provide work. Capital resources consist of founder investments and acquired loans.

Methodology

Multiple linear regression is used to test the influence of these resources on the creation speed and growth in terms of revenue of nascent ventures in the ICT or alternative energy sector. The independent variables in this analysis are the time from venture conception to the moment when the first founder started working, the first employee was hired, the first service provider was hired, the first investment by a founder was made and when the first loan was acquired. The quantity of each resource, the sector in which the venture operates and the nature of the good it provides are included as control variables.

Results

The multiple linear regression analyses show that various human and capital resources influence creation speed significantly. No significant influence of any resource is found on revenue. The revenue of a nascent venture seems to be only influenced by the sector in which it operates.

Conclusion & Discussion

These results show that it is important to account for the timing of resource acquisition in theoretical frameworks that seek to explain the performance of nascent ventures since at least one performance indicator is significantly influenced by it. This study does suffer from some limitations. The analyzed sample is not perfectly representative of the population and the assumption is made that all resources are homogeneous. However, additional analyses find that, despite the limitations, the results are robust and suggest that the acquisition timing of a number of other resources can be influential on both creation speed and revenue as well.

1. Introduction

Entrepreneurship is regarded as having societal and economic benefits and has thus attracted the interest of researchers and policy makers alike. Researchers have found that entrepreneurship can have positive effects on job creation (Neumark et al, 2011), innovation (Acs et al, 2013) and the economy (Stam & van Stel, 2011) in a country. It is generally understood as the creation of a venture in order to exploit opportunities. There are many different distinct types of entrepreneurship such as social, sustainable, institutional and economic entrepreneurship. What distinguishes one type from the other is the goal that the entrepreneur seeks to achieve. The focus lies on economic entrepreneurship in this study and the following definition of entrepreneurship is used: “entrepreneurship is economic activity by one or more individuals that translates into the registration of a new, independent for-profit firm (Herrmann et al, 2018).”

However, most ventures do not significantly contribute to job creation, innovation or economic growth. As Shane (2009) observed, in line with Davidsson (2006), most new ventures are not created with the intention of growing employee numbers or generating wealth but more as a form of self-employment. Furthermore, Shane (2009) observed that new ventures are less productive than established businesses and generate lower quality jobs. Nascent ventures as a whole contribute less to job creation than is historically claimed (Birch, 1987; Neumark et al, 2011). While new ventures do create a lot of jobs, they are also far more likely to cease operations compared to older businesses (Fritsch & Weyh, 2006; Haltiwanger et al, 2013). Haltiwanger et al also found that larger firms have a higher job creation rate than small firms when controlling for the age of firms. Recent business demography statistics from the EU are in line with these findings. They show that in all but seven EU countries ventures that survive for five years shrink in employment size (Business demography statistics, 2020a). Almost 60% percent of ventures do not reach the five year mark and all the created jobs are lost. Furthermore, the value added per employee is generally higher in large firms than in small ones (Entrepreneurship, 2020). Fritsch & Weyh (2006) and Shane (2009) concluded that only a small number of ventures are responsible for a disproportionate amount of created jobs and economic growth. Eurostat estimates such high-growth enterprises, defined as firms that have an average year over year number of employees growth of over 10% for at least three years starting with at least ten employees, accounted for around 16% of employment in the EU in 2017 (Business demography statistics, 2020b). It is thus important for policy makers and nascent entrepreneurs to understand why some ventures perform better than the rest and allow for such success.

The Resource Based View (RBV) proposes that ventures can develop competitive advantages based on their tangible and intangible resources (Barney, 1991). This, in turn, influences the performance of the venture. Various recent studies are in line with this view and have studied how firm resources affect venture performance (Bosma et al, 2004; Capelleras et al, 2010; Price et al, 2013; Coleman et al, 2013; Lonial & Carter, 2015). The broad concept of performance is often narrowed down to performance indicators such as venture survival, creation speed or growth. Survival and creation speed relate to if and how long it takes a venture to progress from a business idea to a profitable firm. Growth can be defined in terms of employment growth and financial growth (Brush & Vanderwerf, 1992).

This study aims to address two gaps in the existing literature. First, many studies only consider the effect of resources on one performance indicator which limits the applicability of their results. A resource may have a positive influence on the creation speed of a venture but it may be less impactful on its growth. A study that includes different performance indicators by Bosma et al (2004), confirms this for various resources. Pacheco-de-Almeida et al (2015) go even further and find a trade-off between performance indicators and argue that there is an ideal venture creation speed; a slow creation process causes revenue losses while accelerating the process increases costs. Therefore it is important to contrast the relations between resources and multiple performance indicators.

Secondly, a common feature in studies researching nascent venture performance is the rather static measurements of variables. Resources are commonly measured in terms of founder experience and education, available financial assets or social networks at a given point in time (Barney, 1991). This allows researchers to study the influence that one of these resources has on venture performance over time. For example, Steffens et al (2012) finds that homogenous founder teams are less profitable over time and Nuñez (2015) finds that ventures founded by a team instead of a single person complete more venture start-up activities over time. However, in such studies where static measurements are used, the initial phase of the venture creation process is overlooked. A venture does not start with any resources but merely as an idea. The identification and acquisition of necessary resources is crucial for the success of the venture in that phase (Lichtenstein & Brush, 2001). The timing and sequence in which these resources are acquired can subsequently determine what distinctive capabilities the nascent entrepreneur can develop (Brush et al, 2001).

Literature on the influence of resource acquisition timing on venture performance is very limited. The most relevant study by Kunc & Morecroft (2010) found vast differences in the performance among ventures even when they started with identical resource positions. They confirm that the timing and sequence in which resources are acquired play a role in the performance of firms. However, their study was based on a study of a simulated decision-making environment with executive and MBA students. Studies into how timing of resource acquisition in nascent ventures influences performance are missing. To address these two gaps in the process-oriented entrepreneurship literature, this study investigates the following question:

How does the timing of resource acquisition influence nascent venture creation speed and growth?

The answer to this research question is gained from an analysis of the “Perfect Timing” database. This dataset contains information on the entrepreneurial activities of over 800 nascent ventures. (Herrmann et al, 2018). The ventures are active in the information and communication technologies and alternative energy sectors in Germany, Italy, the Netherlands, United States and United Kingdom. This dataset is particularly useful to answer this research question as it has records of the dates on which entrepreneurial activities have been undertaken and which resources have been acquired. The timing of resource acquisition can be measured by calculating the time in months between the inception of the venture and when individual resources have been

acquired. Subsequently, with multiple regression analyses the resources can be identified of which the acquisition timing have a significant influence on the performance of ventures.

A number of scientific and societal contributions are made by the analyses of the timing of resource acquisition and the effects of that timing on different performance indicators. First, it builds on existing literature such as Bosma et al (2004), Capelleras et al (2010), Price et al (2013) Coleman et al (2013), Lonial & Carter (2015) and the RBV in that a new perspective is taken on the role of resources on nascent venture performance. The timing in which resources are acquired is taken as a determining factor for nascent venture performance in addition to commonly used static measurements such as the presence or quantity of resources. The results of the analyses show that the acquisition timing of some resources is indeed influential on the performance of nascent ventures. Furthermore, because the effects of resource acquisition timing is measured on both creation speed and growth, a better understanding is gained of the trade-off between those performance indicators. Secondly, this study contributes not only to the nascent venture creation process field of study started by Reynolds & Miller (1992) and continued by Ruef (2005) and Jaspers & Hak (2013) among others but also to more recent studies into venture creation process speed by Liao et al (2005) and Shim & Davidsson (2018) as more empirical data is gathered on the timing and order in which venture creation activities such as resource acquisition take place. Finally, the relations found between timing of resource acquisition and performance in this study can be of value for policy makers and entrepreneurs. Policy makers can develop policy that assists in the timely acquisition of resources that are influential for nascent venture performance and managers gain a better understanding of which resources they should acquire early and what effects that will have.

In the next chapter, more is explained about the RBV and venture performance. Hypotheses for the relationship between various resources and performance indicators are formulated in that chapter as well. In chapter 3, the method in which the data from the "Perfect Timing" database is processed and analyzed is described and attention is paid to the research quality indicators. The results of the analyses are presented in the fourth chapter. Descriptive statistics of the analyzed data are discussed first and then the results of the regression analyses. The discussion and conclusion are the final chapter of this paper. The limitations, implications and take-away from this paper are presented there.

2. Theory

The RBV forms the foundation of the theoretical framework that is applied in this study. The central premise of this theory is that ventures are built up of resources which determine the services it can deliver Penrose (2009). Barney (1991) builds on this idea and argues that ventures can derive competitive advantages from the set of tangible and intangible resources they possess. Resources that are valuable, rare, imperfectly imitable and non-substitutable are best for this.

Competitive advantages are gained by developing value-creating strategies based on the resources available to a venture and allow the venture to outperform its competitors. It is, of course, also possible that strategies are developed that reduce the efficiency and effectiveness

of the venture and cause it to perform worse. A firm can possess a wide range of resources from which it can derive competitive advantages. Examples are education, experience and motivation of employees, raw materials, office space, loans, social networks, patents and management structures. Venture resources are commonly categorized as physical, human, capital, organizational or social as exemplified by Capelleras et al (2010), Price et al (2013), Coleman et al (2013) and Lonial & Carter (2015).

This study focuses on the timing of human and capital resources. These two resource categories are chosen as both are essential resources without which a profit focused venture could not start up. Human resources encompass the founders, employees, service providers and the experience, education and motivations they have. Capital resources are the financial resources available to the venture such as money invested by the founders or money acquired through loans. Before the relations between the human and capital resources and venture performance are discussed in more detail, the concept of venture performance will be further explained.

2.1 Nascent venture performance

Nascent venture performance is a subject that has been studied extensively since the concept of nascent ventures was introduced by Reynolds & Miller (1992). Since then, many interesting and important findings have been made but the concept of nascent venture performance remains very broad (Davidsson, 2006; Davidsson & Gordon, 2012). Performance is conceptualized in many different ways. Several studies express performance in terms of the number or proportion of completed gestation activities in a time span (Davidsson & Honig, 2003; Delmar & Shane, 2004; Eckhardt et al, 2006; Tornikoski & Newbert, 2007). Others based performance on the (self-reported) status of nascent ventures (Carter et al, 1996; Van Gelderen et al, 2005; Dimov, 2010; Van Gelderen et al, 2011). More objective performance measures are financial milestones such as first sales (Newbert, 2005; Tornikoski & Newbert, 2007), profitability (Honig & Karlsson, 2004) or scale measures such as the amount of revenue and profits (Delmar & Shane, 2006; Cassar, 2007; Thiess et al, 2016). Other objective but non-financial performance measures are also used, for example, employee growth (Honig & Samuelsson, 2014). Given that it would go beyond the scope of this thesis to encompass all these definitions of performance, the performance of nascent ventures will here be investigated through the most common dynamic and static concepts, namely ***venture creation speed and growth***.

Venture creation speed, and the factors that influence it, is the lesser studied concept of the two. Creation speed is based on the venture creation process which has been studied since the beginning of the nascent ventures field of study. Reynolds & Miller (1992) attempt to determine the conception and birth events of nascent ventures in the paper in which they introduce the concept of nascent ventures. They compare two theories, the entrance of an economic actor and the birth of a biological organism, and come to the conclusion that first sale may be suitable as a birthday but that both analogies are not adequate to identify a conception point. The conception of a venture is most often marked by an informal event that is not systematically recorded and is therefore difficult to measure. A more recent study by Reynolds (2017) shows that the concepts of venture birth, let alone venture conception, have still not been narrowed down to one definitive event. He lists the first economic transaction, first registry listing, first labor input and first period

of profitability as viable birth events and end points to the creation process. However, which event is chosen, strongly influences the length of the measured creation process and how successful the venture was in completing it.

Research into venture creation speed and its outcomes and determinants started later and developed new conceptualizations of creation speed. Liao et al (2005) continue on Reynolds & Miller's early work by studying the temporal patterns of the creation process. They argue that the venture creation process is non-linear and that venture gestation events can occur in any sequence and not all need to occur. The duration of the venture creation process is subsequently defined as the time (in months) between the first gestation event and the last event, first sale, thereby avoiding having to define a specific conception point. In Shim & Davidsson's (2018) study into the outcomes of creation speed the definition of the venture conception point is refined to the time when the first gestation activity is undertaken and at least one additional activity is undertaken in the following year. The creation process duration is measured from that point to the time when profitability is reached. They find that the chance of successful creation is maximized around three months and that creation speed is thus a significant characteristic of the creation process. Defining venture conception as the first gestation activity is often methodologically challenging as it requires data collection on a large number of different events. A more practical solution is used by Capelleras & Greene (2008) and Capelleras et al (2010). They conceptualize the creation speed as the time from having the business idea to market entrance and the time from inception to launch of the business respectively.

Venture growth is, unlike creation speed, an often used performance measure. The employment and revenue growth dimensions of venture growth are often used as measurements (Brush & Vanderwerf, 1992; Delmar, 2006). These dimensions are primarily chosen because they are objective and easy to measure since this data is often well recorded within firms. The aforementioned studies by Capelleras & Greene (2008) and Capelleras et al (2010) studied employment growth as a dependent variable of creation speed for example. Other studies, such as Cassar (2007), focus on the effects of the founder's growth preferences on employment growth. Employment growth is also a particularly useful performance measure in studies with a macro perspective. Neumark et al (2011) and Haltiwanger et al (2013) studied how much new ventures contribute to job creation as a whole. Delmar & Shane (2006) and Thiess et al (2016) used revenue as a dependent variable and studied the effects of founder (team) characteristics on that performance indicator. Financial indicators such as revenue are useful performance measures as they give an indication of whether a venture can generate enough income to stay in business. In that sense profit is a more useful measure than revenue as it takes costs into consideration as well. However, profit is commonly generated much later in the venture creation process than revenue if at all (Reynolds, 2016). Therefore in a study of nascent ventures revenue is a more reliable growth indicator. A drawback of absolute measures like employment and revenue growth is that they are biased towards larger firms (Delmar, 2006). However, this should not be an issue in this study as all ventures have the same starting condition after controlling for environmental influences.

2.2 Human resources

Broadly defined, human resources are the individuals and their characteristics that are working for the venture. Barney (1991) defined human resources or human capital as “the training, experience, judgment, intelligence, relationships, and insights of individual managers and workers in a firm.” Unger et al (2011) added several other characteristics including formal education and start-up experience. Not only personal characteristics such as these have proven to be influential on venture performance but also the number of people working for a venture (Cooper et al, 1989; Brüderl et al, 1992; Portugal et al, 2003). Ventures with a larger initial size have a higher survival rate while smaller ventures grow relatively quickly. Three distinct groups of individuals that work for nascent ventures can be defined: founders, employees and service providers (Held et al, 2018). Each group can influence the performance of the nascent venture differently.

Various studies find that founders are the most significant determinant for a venture’s performance (Bates, 1990; Cooper et al, 1994; Colombo & Grilli, 2005). Existing research finds that founder characteristics such as the level of education and the start-up experience of a founder influence the survival, growth and sales of a venture. More specifically, highly educated founders are more likely to start a sustainable venture (Bates, 1990) and experienced founders contribute to venture growth, creation speed and sales (Delmar & Shane, 2006; Capelleras & Greene 2008). The composition and size of founder teams also influence the performance of ventures. Founder teams with heterogeneous experiences in management, industry and start-ups outperform teams with only highly experienced members (Steffens et al, 2012; Thiess et al, 2016). Furthermore, larger founder teams tend to outperform solo founders or smaller teams both in terms of creation speed and revenue as they tend to be more diverse and have the capacity to execute more venture creation activities (Chandler et al, 2005; Nuñez, 2015). Little research has been done on how the timing of when a founder starts working on a nascent venture affects its performance. However, the earlier a founder starts working on a venture, the earlier his skills and experience start to have influence on the development of the venture. Therefore the following hypotheses are developed:

H1a: Ventures for which a founder starts working earlier are characterized by a faster creation speed

H1b: Ventures for which a founder starts working earlier generate a higher revenue

The role of employees in the performance of ventures has received less attention from researchers. Employees are the individuals who are hired on the basis of a permanent or temporary contract or they are subcontracted workers. They contribute to the production capacity of a venture and are thus an important resource for the development of a venture (Rocha & Brymer, 2018). Studies find ventures that hire more employees have a higher rate of survival and generate higher revenue in subsequent years (Brüderl et al, 1992; Coad et al, 2017). Furthermore, the characteristics of employees such as education are less impactful on venture performance compared to the characteristics of founders. The timing of acquiring employees or service providers matter for the effect it has on venture creation speed and growth. Acquiring a larger workforce can speed up the venture creation process as more work can be done with a larger

number of people. However, when too many people are hired, or they are hired too early, the profitability of the venture is reduced and its survival is jeopardized.

H2a: Ventures that hire their first employee early on are characterized by a faster creation speed
H2b: Ventures that hire their first employee early on generate a higher revenue

Service providers likely have a similar impact on nascent venture performance as employees since their role within a venture is similar. They provide labour. The difference between service providers and employees is that they are hired to perform just a specific task and are compensated for that with a (one-time) fee. Typical examples of service providers are tax accountants, notaries, lawyers or consultants. The majority of small ventures use one or the other service provider and consider their work to be impactful to the venture's performance (Bennet & Robson, 1999). Current literature doesn't describe the impact each type of service provider has on venture performance but consultants, for example, can increase the productivity, return on assets and profits of SMEs (Bruhn et al, 2018). Different factors influence whether service providers or employees are hired (Chandler et al, 2009). The hiring process of service providers is less expensive and time intensive than that for employees. However, employees can be trained more effectively and gain company and product related skills. The effect of service providers and employees can therefore be expected to be different.

H3a: Ventures that hire their first service provider early on are characterized by a faster creation speed
H3b: Ventures that hire their first service provider early on generate a higher revenue

2.3 Capital resources

Capital resources are the financial assets of the venture. Acquisition of capital is a key activity in a new venture as financial capital enables the venture to invest in the development and manufacture of the product or service it tries to sell and increases the probability of succeeding (Montgomery et al, 2005). Founder investments and loans are the two most common sources of capital to new ventures (Gartner et al, 2012). Each source of capital has different characteristics. Gartner et al (2012) found in a study of 1214 nascent ventures that over half of the ventures are funded by personal contributions from founders. Nascent entrepreneurs tend to choose easy to access sources of funding, (i.e. personal wealth), before turning to more complex sources of funding (Matthews et al, 2013; Frid, 2014). Funding provided by founders, or "skin in the game" as Frid et al (2015) describes that, increases the likelihood of success and persistence in venturing efforts.

H4a: Ventures that receive an investment by a founder early on are characterized by a faster creation speed
H4b: Ventures that receive an investment by a founder early on generate a higher revenue

The second major source of capital for nascent ventures are loans (Gartner et al, 2012; Avery et al, 1998). Ventures that manage to attract external funding such as loans generate higher revenue. Other studies find that loans increase the chance of venture survival (Lee & Zhang, 2011) and that loans which are acquired in the early years of a business can have a long lasting positive effect on the profitability of the firm (Kariv & Coleman, 2015). Finally, Hechavarría et al (2016) found that ventures using debt as a source of income complete the creation process faster. Loans have such a positive impact on venture performance because they can help early-stage ventures overcome periods in which they are not profitable (González-Uribe & Mann, 2017). This also allows ventures to avoid having to use equity financing which would result in equity dilution and a decrease in long term value of the venture for the founders.

H5a: Ventures that acquire a loan early on are characterized by a faster creation speed
H5b: Ventures that acquire a loan early on generate a higher revenue

Figure 1 provides an overview of the theoretical and analytical framework upon which this paper is based. The control variables will be discussed in the next chapter.

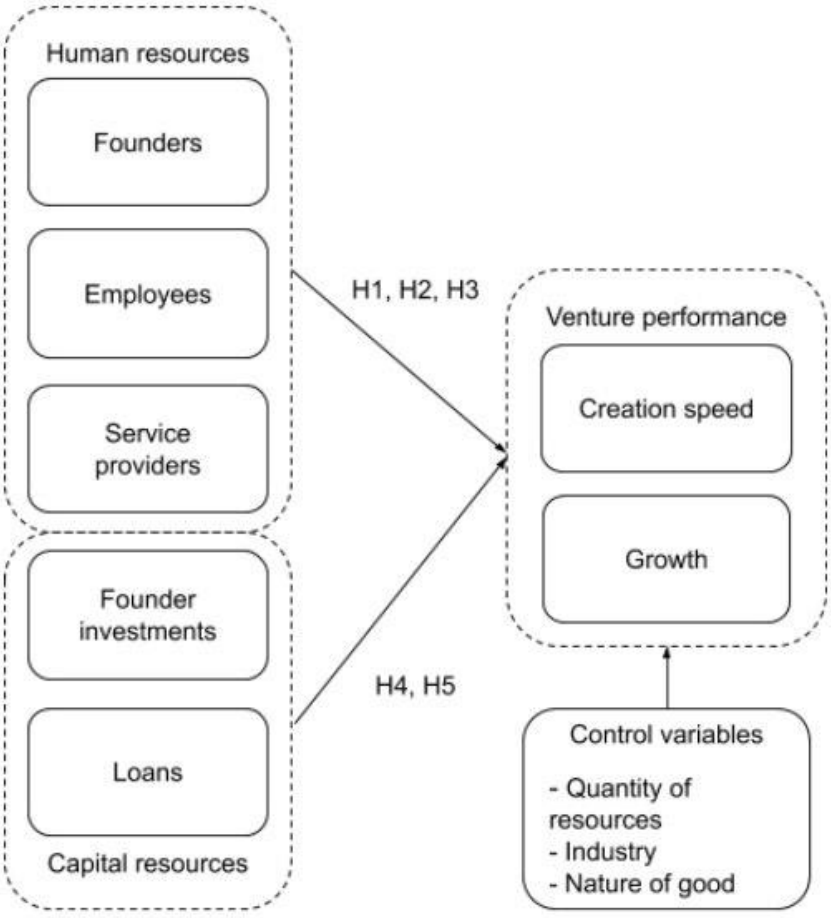

Figure 1: The conceptual framework

3. Methodology

The goal of this paper is to study how the timing of resource acquisition influences nascent venture creation speed and growth. A deductive approach is taken as existing literature has found evidence suggesting relations between the different variables in this study. Quantitative data from the "Perfect Timing" database is used and analyzed with multiple linear regression to test the hypotheses.

3.1 Sampling strategy & Data collection

The "Perfect Timing" database contains data on the details and circumstances of venture creation, length of the venture creation process and intermediary steps, team formation and finance acquisition on a monthly basis (Herrmann et al, 2018). This covers all data required for completing analyses of the impact of resource acquisition timing on venture performance. The database has a distinct advantage over other databases that track venture activity such as the Panel Study of Entrepreneurial Dynamics (PSED) and the Global Entrepreneurship Monitor (GEM) in that it includes the precise start and end dates of resource acquisition activities of ventures. The sample of the "Perfect Timing" database was constructed by randomly selecting ventures that were registered in Bureau van Dijk's ORBIS database[1] that matched the following definition of entrepreneurship: *"economic activity by one or more individuals that translates into the registration of a new, independent for-profit firm."* Other criteria for selection were registration year and industry. The firm had to be registered between 2004 and 2014 and operate in the Alternative Energy (AE) or Information and Communication Technologies (ICT) sector. The two sectors were chosen as they differed strongly in terms of the amount of subsidies they receive but are similar in the sense that they are forward looking. Data was collected in two waves from 2011 to 2014 and from 2014 to 2018. In the first wave data was collected from Germany, the United States and the Netherlands. The United Kingdom and Italy were added in the second wave and based on minor changes in the data collection method the dataset of the first wave was completed by re-interviewing. Data was collected by interviewing founders, owners or employees of each selected venture that were sufficiently knowledgeable about the subject venture. Interviews were taken using a structured interview guide to systematically capture the activities of the venture throughout its venture creation process. Overall, the dataset contains 850 ventures, whereby the venture creation process constitutes the unit of analysis.

3.2 Operationalization

The dependent variables in this study are venture creation speed and venture growth. Nascent venture creation speed is the time it takes to complete the venture creation process. The process starts with the conception of the venture and finishes with the birth of the venture (Reynolds & Miller, 1992). Those two events are notoriously difficult to define as has been discussed in the theory section. The optimal method to determine the conception point, using the first gestation activity performed as Shim & Davidsson (2018) did, is not possible with this database as it contains limited data on performed gestation activities. Therefore, the conception point of the venture is considered to be when the business idea was first discussed by the founder. Nearly all

[1] See https://www.bvdinfo.com/en-gb/our-products/data/international/orbis

cases contain data on this event and it is the earliest gestation activity undertaken in most of the cases. The moment when the venture enters a period of sustainable profits for the first time is taken as the birth of the venture and the end of the creation process. A period of sustainable profitability is defined as a period of three months in which net monthly revenue exceeds monthly expenses. Using a financial indicator for this is appropriate since reaching profitability is the main objective of all the selected firms in the dataset (Reynolds, 2017). Thus, creation speed is measured as the time in months between the moment when the business idea was first discussed by a founder and the moment when the venture is profitable for at least three months for the first time.

Venture growth is often measured in terms of employment numbers or financial growth (Brush & Vanderwerf, 1992; Delmar, 2006). As employment numbers are considered a human resource in this study, the concept of venture growth is narrowed down to revenue. Revenue is a good performance indicator as it is objective and shows whether a firm will be able to survive over time. Revenue is measured over the course of a full year after the first revenue has been generated. This reduces the influence of a major sale or a low initial revenue and makes the measurement more representative for the actual growth of the ventures. The measurements of revenue are converted to Euros using the conversion rate of the year in which the revenue was generated to make results comparable across nations.

Multiple independent variables are defined for both human and capital resources. Three indicators are used to measure the influence of human resources on creation speed and growth. These are the time to first founder work, time to first employee hiring and time to first service provider hiring. These three indicators are each measured by the time in months between the conception point of the venture and the moment when the first founder started working on the venture, the first employee was hired and when the first service provider was hired respectively. The conception point is once again defined as the moment when the business idea was discussed for the first time by a founder. The measurements for the capital resources indicators are constructed in a similar way. The indicator measuring the influence of the timing of founder investments is defined as the time between venture conception and the moment when a founder invested into the venture for the first time. The final indicator measures the influence of the timing of loan acquisition on the dependent variables and is the time between venture conception and when the first loan was acquired.

Venture performance is not only influenced by the independent variables derived from the above hypotheses but also by other venture characteristics and environmental factors. Many studies have shown that the quantity of resources available in a venture are a significant determinant of the performance of nascent ventures as has been discussed in the theory chapter. Therefore control variables are included in the regression analyses for the number of founders, employees, service providers, investments by a founder and loans. These quantity variables are regressed together with the independent variables for each corresponding resource in order to do justice to the literature. It has to be noted that the measured quantity level of founders, employees and service providers is limited to five as only the first five of each have been recorded accurately in the database. The number of investments by a founder is limited to fifteen as only the first three

investments by the first five founders have been recorded. The number of loans is limited to fifteen for the same reason. These limitations are not prohibiting as only a few cases[2] have acquired the maximum recordable number for most of the variables. Furthermore, the total number of founders, employees and service providers that have worked for the venture was recorded in the database. While more data was missing for this variable, it did show that only a relatively small percentage[3] of cases had more than five for any of the resources.

Two more control variables are added to the respective models in order to account for the industry in which a nascent venture operates and for the nature of the good that the venture offers (i.e. a service, product or a mix). The industry variable is included to account for different sector characteristics which can influence venture operation and performance (Gordon & Davidsson, 2013; Li & Dutta, 2018). The variable is dichotomous and can either indicate whether the venture is active in the Information and Communication Technologies (ICT) or the Alternative Energy (AE) sector. The latter encompasses solar, wind, biomass, waste treatment or grey biotechnology sectors.

The nature of the good offered by the venture is also an important factor to account for. The nature of the good in this study refers to whether the venture provides a service, product or a mix of the two. Production and service focused ventures tend to differ in the resources they need and how they develop and can thus perform differently with the same resources (Audretsch et al, 2004). Gordon & Davidsson (2013) find that manufacturing ventures take longer to set up than other ventures for example. Two dichotomous dummy variables are created to account for these effects. One compares the performance differences between ventures that provide a service and those that provide products, the other compares the performance of service ventures versus ventures that offer both services and products. Other control variables such as the location of operation and the level of innovativeness have been tested but left out of the final regression models as no significant relation between these and the dependent variables were found. An overview of the operationalization of the different variables, indicators and measurements can be found in table 1.

[2] The following percentage of cases reach the measurement limits for each quantity variable: 6,9% for founders, 9,7% for employees, 10,8% for service providers, 0,01% for founder investments and 0% for loans.

[3] The following percentage of cases exceed the measurement limit in the alternative variable: 2,3% for founders, 22,9% for employees, 6,2% for service providers, 1,8% for founder investments and 0% loans

Table 1: Operationalization table of variables

Variable	Indicators	Measurements
Dependent variables		
Creation speed	Time between conception and birth of venture	Amount of months that have passed between when the business idea was first discussed by a founder (venture conception) and the moment when the venture was profitable for at least three months for the first time (venture birth)
Growth	Revenue	Amount of revenue in the year after the first revenue was generated in EUR. USD and GBP values are converted using the average conversion rate of that year.
Independent variables		
Human resources	Timing of first work by a founder	Time in months between venture conception and moment when the first founder started working on the venture
	Timing of first employee hire	Time in months between venture conception and moment when the first employee was hired
	Timing of first service provider hire	Time in months between venture conception and moment when the first service provider was hired
Capital resources	Timing of first investment by founder	Time in months between venture conception and moment when the first investment of a founder was received
	Timing of first loan acquisition	Time in months between venture conception and moment when the first loan was acquired
Control variables		
Human resources	Number of founders	Total amount of founders that have contributed to the venture (limited to five)
	Number of employees	Total amount of employees that have contributed to the venture (limited to five)
	Number of service providers	Total amount of service providers that have contributed to the venture (limited to five)
Capital resources	Number of investments by founders	Total amount of times a founder has invested in the venture (limited to fifteen)
	Number of loans	Total number of loans acquired by the venture
Industry	Sector	Information and Communication Technologies (ICT)* Alternative energy (AE)
Nature of good	Product / service	Service* Product Mixed

*: reference category in the following OLS regression analyses

3.3 Analyses

Multiple Linear Regression (MLR) is used to analyze the data and answer the hypotheses. The MLR method, which is an extension of ordinary least-squares regression, gives insights into the relation between a dependent variable and different independent variables. The first step in the analysis is to explore the data using descriptive statistics and correlation analyses. Due to a high percentage of missing data in some variables, pairwise deletion had to be used for the regression analyses. Subsequently, the assumptions for MLR are tested. Not all assumptions proved to be satisfied. This was resolved by removing the outliers identified by calculating the Mahalanobis distances for each case in the full models for both creation speed and revenue. Subsequently, the variables that were not normally distributed were either LOG or SQRT transformed. In the last step, the variables and models were tested for homoscedasticity and multicollinearity respectively. These assumptions were not violated. The following models are estimated after having completed the aforementioned steps:

- Model 1: control variables
- Model 2: human resources
- Model 3: human resources & control variables
- Model 4: capital resources
- Model 5: capital resources & control variables
- Model 6: all resources
- Model 7: all resources & control variables

By contrasting models with and without control variables to each other, a better insight can be gained into the influence of control variables on the dependent variable in each model. Separate models for human and capital resources are estimated to increase the ratio of analyzed cases per variable. This is necessary, especially for models with the revenue dependent variable, to maintain statistical significance of the models when there is a low number of cases. It also increases the reliability of the observations. The models were finally checked for multicollinearity using VIF values and independence of observations using Durbin-Watson statistics. These last two assumptions were not violated. The mathematical formula of the full regression model is:

$$
\begin{aligned}
Y_i &= \beta_0 && (\beta_0 = \textit{intercept of the y-axis}) \\
&+ \beta_1 X_{i1} && (X_1 = \textit{sector variable}) \\
&+ \beta_2 X_{i2} && (X_2 = \textit{service vs product dummy variable}) \\
&+ \beta_3 X_{i3} && (X_3 = \textit{service vs mixed dummy variable}) \\
&+ \beta_4 X_{i4} && (X_4 = \textit{number of founders variable}) \\
&+ \beta_5 X_{i5} && (X_5 = \textit{log transformed timing of first work by a founder variable}) \\
&+ \beta_6 X_{i6} && (X_6 = \textit{log transformed number of employees variable}) \\
&+ \beta_7 X_{i7} && (X_7 = \textit{sqrt transformed timing of first employee hire variable}) \\
&+ \beta_8 X_{i8} && (X_8 = \textit{number of service providers variable}) \\
&+ \beta_9 X_{i9} && (X_9 = \textit{log transformed timing of first service provider hire}) \\
&+ \beta_{10} X_{i10} && (X_{10} = \textit{log transformed number of investments by founders variable}) \\
&+ \beta_{11} X_{i11} && (X_{11} = \textit{log transformed timing of first investment by a founder variable}) \\
&+ \beta_{12} X_{i12} && (X_{12} = \textit{sqrt transformed number of loans variable}) \\
&+ \beta_{13} X_{i13} && (X_{13} = \textit{log transformed timing of first loan acquisition variable}) \\
&+ \varepsilon_i && (\varepsilon_i = \textit{error term})
\end{aligned}
$$

In this formula X_i represent the different independent variables and Y_i either creation speed or revenue as the dependent variable. The numbers 1 through 13 signify which control, human resource or capital resource variable, is used. β is the slope coefficient for each respective independent or control variable except for β_0 which is the y-intercept. The remaining symbols, i and ε, are the individual cases and the error term respectively. The partial models can be easily derived from this formula by removing the terms of the variables which are not included in that model.

3.4 Research quality indicators

A strength of this research is the high reliability. The data used is gathered through structured interviews and little interpretation or coding is required for the analysis of that data. If the final measurements and analysis methods are followed closely the findings should be replicable. A limitation of the study is the generalizability. While data from multiple countries is used, the generalizability of the findings will be limited by the number of industries in the sample as data has only been collected from nascent ventures in the alternative energy and information technology sector. The validity of the indicators for the independent variables is also somewhat limited. For example, research has shown that, especially for human resources, factors such as personal networks, experience, education and motivation are determinants for venture success. The measurements of human resources do not account for these factors but rather make the assumption that all founders, employees and service providers are homogenous and have beneficial characteristics for venture performance. This limitation is accepted since the purpose of the study is to find the influence of timing of resources on venture performance for which the measurement is well suited.

4. Results

4.1 Descriptive Statistics

Table 2 reports an overview of the variables derived from the "Perfect Timing" database for the regression analyses after the data has been processed following the method described in the previous sections. The dataset consists of 22 variables and 771 cases. The table reveals that there is a large amount of missing data for a number of variables. For the variable with the highest percentage of missing values, number of loans, up to 75% cases have not taken out a loan or were unable to report figures for that. Revenue is with 294 cases the variable with the second highest percentage of missingness closely followed by the "time to first employee" variable. While the amount of missing data is high, enough cases are left for a useful analysis.

Besides insights into the missing data in the database, table 2 also presents descriptive statistics for each of the variables. The average creation speed of the sampled ventures is approximately 28 months. The range of this variable is very wide. The venture which was created fastest took just two months while the slowest venture took over twenty years. The range of revenue generated is also wide. The highest revenue generated is 5.7 million euros and the lowest is 1200 euros. The mean revenue is close to 350 thousand euros.

The timing and quantity indicators for both human and capital resources are grouped together in the table. The workforce of a firm consists, on average of 2,21 founders, 1,12 employees and 2,29 service providers. The ranges of the quantity indicators are limited from zero to five in line with the limitations of the database which have been discussed in the methodology section. Employees and service providers are hired, at the earliest, in the same month as when the venture idea was first discussed and founders might start working on a venture a month before they discuss the venture idea with someone else. The first founder starts working on the venture within 2,27 months. The first employees and service providers are hired within 15,9 and 8,41 months of venture conception on average.

The descriptive statistics on capital resources show that not all ventures receive financial investments from their first five founders. The maximum number of recorded founder investments into their venture is fifteen which is much higher than the average of 2,15 investments by founders. The maximum number of loans that the sampled ventures have taken out is six and the minimum is zero. Founder investments are unsurprisingly the first source of capital to a venture. On average the first investment is made within 11,77 months while the first loan is acquired after 17,69 months. The minimum time to first investment or loan is zero months for both variables. A first loan is acquired after 81 months at the latest while the first founder investment can be made as late as 245 months after the conception of the firm.

Table 2: Descriptive statistics of interval variables

Variables	N	Minimum	Maximum	Mean	Median	Std. Deviation
Creation speed	682	2	245	27,86	21	23,47
Creation speed (log)	682	1,10	5,51	3,08	3,09	0,76
Revenue	294	1.200	5.762.900	354.695	15.000	610.944
Revenue (log)	294	7,09	15,57	11,82	11,92	1,50
Number of founders	771	1	5	2,21	2,00	1,17
Timing of first work by a founder	767	-1	52	2,27	0,00	6,31
Timing of first work by a founder (log)	767	,00	3,99	1,05	0,69	0,72
Number of employees	762	0	5	1,12	0,00	1,67
Number of employees (log)	762	,00	1,79	0,50	0,00	0,66
Timing of first employee hire	311	0	96	15,90	11,00	14,39
Timing of first employee hire (sqrt)	311	,00	9,80	3,60	3,32	1,73
Number of service providers	769	0	5	2,29	2,00	1,50
Timing of first service provider hire	668	-5	71	8,41	5,00	11,02
Timing of first service provider hire (log)	668	,00	4,34	2,46	2,40	0,61

Table 2 (continued): Descriptive statistics of interval variables

Variables	N	Minimum	Maximum	Mean	Median	Std. Deviation
Number of investments by founders	771	0	15	2,15	2,00	1,73
Number of investments by founders (log)	771	,00	2,77	1,01	1,10	0,54
Timing of first investment by founder	675	0	245	11,77	7,00	16,18
Timing of first investment by founder (log)	675	,00	5,51	2,13	2,08	0,88
Number of loans	771	0	6	0,38	0,00	0,80
Number of loans (sqrt)	771	,00	2,45	0,30	0,00	0,54
Timing of first loan acquisition	193	0	81	17,69	12,00	16,31
Timing of first loan acquisition (log)	193	,00	4,41	2,59	2,56	0,84

The descriptive statistics of the remaining control variables in table 3 show that the majority of ventures are within the ICT sector. 246 ventures are active in the alternative energy sector versus 515 in ICT. The ventures are spread more evenly over the “nature of good” categories. 180 ventures are production focused, 255 offer products and services and 336 ventures are exclusively service providers. The ventures in the alternative energy sector and those offering products have the highest creation speed, meaning that it takes those ventures on average the longest to reach sustainable profits after discussing the venture idea for the first time. Ventures offering mixed goods take longer to create than service ventures but shorter than production ventures. In terms of average revenue, ventures in the alternative energy sector score more than three times as high as ICT ventures. While production ventures take longest to set up, they also earn the highest revenue. Service ventures generate less revenue and ventures offering mixed goods over the least.

Table 3: Descriptive statistics of categorical variables

Variable	Category	Frequency	Avg. creation speed (months)	Avg. revenue
Sector	ICT	246	30,17	€ 629.381
	AE	515	26,75	€ 197.522
Nature of good	Service	180	35,67	€ 489.456
	Product	336	23,85	€ 342.749
	Service & product	255	28,30	€ 237.071

4.2 Correlation analyses

The correlation analyses results for creation speed and revenue can be found in table 4 & 5 respectively. The first table shows that creation speed is positively correlated with all variables except for the dichotomous dummy variable that indicates whether a venture offers both products and services. Revenue is correlated to fewer variables as the second table indicates. Revenue is only correlated to the control variables, number of employees and number of loans. Furthermore, the correlation between revenue and number of employees is negative. A number of the independent and control variables are correlated with each other as well. This can point to multicollinearity issues between those variables. However, the variance inflation factors which have been calculated with each of the regression models proved that these correlations were not strong enough to negatively affect the regression models.

Table 4: Correlation table with creation speed as dependent variable

	Creation speed[1]	ICT vs. AE	Service vs. product	Service vs. product & service	Number of founders	Timing of first work by a founder[1]	Number of Employees [1]	Timing of first employee hire[2]	Number of service providers	Timing of first service provider hire[1]	Number of founder funding[1]	Timing of first investment by founder[1]	Number of loans[2]
ICT vs. AE	,127**												
Service vs. product	,174**	,266**											
Service vs. product & service	,051	-,175**	-,388**										
Number of founders	,258**	,059	,055	,110**									
Timing of first work by a founder[1]	,205**	-,040	,029	-,025	-,032								
Number of Employees[1]	,298**	,024	,042	,079*	,167**	-,072*							
Timing of first employee hire[2]	,504**	,093	,089	-,056	,137*	,269**	-,164**						
Number of service providers	,217**	,160**	,147**	-,020	,168**	,021	,131**	,085					
Timing of first service provider hire[1]	,484**	-,021	-,051	,075	,095*	,303**	,016	,465**	-,062				
Number of founder funding[1]	,148**	,050	,054	,036	,415**	,005	,035	,067	,229**	,006			
Timing of first investment by founder[1]	,549**	,077*	,041	,079*	,122**	,281**	-,027	,497**	,129**	-,621**	-,011		
Number of loans[2]	,234**	,293**	,271**	-,095**	,087*	-,004	,194**	-,072	,206**	-,090*	-,028	,063	
Timing of first loan acquisition[1]	,530**	,044	,046	,084	,274**	,097	,091	,421**	,083	,431**	,150*	,376**	-,118

[1] LOG transformed.

[2] SQRT transformed.

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 5: Correlation table with revenue as dependent variable

	Revenue[1]	ICT vs. AE	Service vs. product	Service vs. product & service	Number of founders	Timing of first work by a founder[1]	Number of Employees [1]	Timing of first employee hire[2]	Number of service providers	Timing of first service provider hire[1]	Number of founder funding[1]	Timing of first investment by founder[1]	Number of loans[2]
ICT vs. AE	,407**												
Service vs. product	,176**	,266**											
Service vs. product & service	-,163**	-,175**	-,388**										
Number of founders	-,058	,059	,055	,110**									
Timing of first work by a founder[1]	,029	-,040	,029	-,025	-0,032								
Number of Employees[1]	,156**	,024	,042	,079*	,167**	-,072*							
Timing of first employee hire[2]	-,131	,093	,089	-,056	,137*	,269**	-,164**						
Number of service providers	,112	,160**	,147**	-,020	,168**	,021	,131**	,085					
Timing of first service provider hire[1]	-,067	-,021	-,051	,075	,095*	,303**	,016	,465**	-,062				
Number of founder funding[1]	-,092	,050	,054	,036	,415**	,005	,035	,067	,229**	,006			
Timing of first investment by founder[1]	-,099	,077*	,041	,079*	,122**	,281**	-,027	,497**	,129**	,621*	-,011		
Number of loans[2]	,282**	,293**	,271**	-,095**	,087*	-,004	,194**	-,072	,206**	-,090*	-,028	,063	
Timing of first loan acquisition[1]	-,071	,044	,046	,084	,274**	,097	,091	,421**	,083	,431**	,150*	,376**	-,118

[1] LOG transformed.

[2] SQRT transformed.

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Model 4 and 5, the models with capital resource indicators explain significantly more variation than model 1 as well. The R^2 of model 4 and 5 is 49,9% and 50,5% respectively. This is a similar increase in explained variation as model 2 and 3 have over the base model. All indicators in model 4 have a significant positive relationship with creation speed. However, in model 5, where the control variables are added, the number of investments by founders loses its significance. The number of investments by founders is only significant at the 10% level in model 4 in the first place. The remaining indicators are significant in both models. The positive relation between the timing of the first investment and creation speed (β = ,329; $p < 0,01$ in model 5) suggests that the later a financial investment is made, the longer it takes for the venture to form. A positive relation between the number of loans and creation speed (β = ,358; $p < 0,01$ in model 5) points to a longer venture creation duration when more loans are taken out. However, taking a loan out earlier in the process can reduce the time it takes to create the venture.

The final two models contain all human and capital resource indicators and are the basis on which the formulated hypotheses are accepted or rejected. Model 6 explains 61,7% of the variation of creation speed and model 7, the model that also includes the control variables, explains 62,2%. These models have a higher explanatory power than the others as they have the highest R^2 values. Fewer indicators are significant in these models than in the partial models that have been discussed thus far. The number of employees indicator still has a significant positive relation at the 1% level (β = ,312; $p < 0,01$ in model 7) with the dependent variable. This means that ventures with more employees take longer to create. The timing of first employee hire also remains significant at the 1% level with a positive relation (β = ,120; $p < 0,01$ in model 7). This means that ventures that hire the first employee later, have a slower creation speed. Hypothesis H2a can thus be accepted. The other hypotheses for human resources, H1a and H3a, have to be rejected as no significant relationship for those is found in model 6 or 7. The indicators for capital resources maintain their relationships to the dependent variable in these models. The significance level of the positive relation between timing of first investment by a founder and creation speed (β = ,189; $p < 0,05$ in model 7) has dropped one significance level to 5% compared to model 4 and 5. This relation is still significant enough to accept hypothesis H4a. Ventures that are invested in earlier by a founder complete the creation process faster. The timing of the first loan acquisition indicator still shows a positive relationship to creation speed at the 1% significance level (β = ,234; $p < 0,01$ in model 7). Therefore hypothesis H5a can be accepted as well. Ventures that acquire a loan early on are characterized by a faster creation speed. The number of loans also remains significant in the full model (β = ,296; $p < 0,01$ in model 7). Interestingly, this suggests that ventures which acquire more loans take longer to complete the venture creation process.

A final insight that can be derived from table 6 is that the coefficients of the interval variables that have been log transformed can be interpreted in percentages as the dependent variable, creation speed, has been log transformed as well. Thus, a 1% change in the number of employees, number of loans, time to the first service provider, investment by a founder and loan acquisition relates to a change with a percentage equal to the coefficient in creation speed.

Table 6: MLR regression results with creation speed as dependent variable

DV: Creation speed[1]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Control variables:							
ICT vs. AE	,161** (,064)		,074 (,075)		-,020 (,100)		-,024 (,113)
Service vs. product	,370*** (,075)		,248** (,088)		,159 (,117)		,137 (,133)
Service vs. product & service	,239*** (,066)		,129* (,078)		,063 (,101)		,067 (,116)
Human resources:							
Number of founders		,066** (,030)	,058* (,030)			,005 (,048)	,003 (,049)
Timing of first work by a founder[1]		,040 (,050)	,041 (,049)			,031 (,072)	,029 (,073)
Number of Employees[1]		,377*** (,053)	,364*** (,053)			,315*** (,079)	,312*** (,080)
Timing of first employee hire[2]		,172*** (,023)	,166*** (,023)			,120*** (,035)	,120*** (,036)
Number of service providers		,072*** (,023)	,062*** (,023)			,026 (,035)	,025 (,036)
Timing of first service provider hire[1]		,360*** (,065)	,371*** (,065)			,145 (,112)	,152 (,113)
Capital resources:							
Number of investments by founders[1]				,141* (,082)	,134 (,082)	,104 (,102)	,101 (,103)
Timing of first investment by founder[1]				,331*** (,053)	,329*** (,054)	,192** (,076)	,189** (,077)
Number of loans[2]				,370*** (,081)	,345*** (,088)	,312*** (,096)	,296*** (,103)
Timing of first loan acquisition[1]				,365*** (,057)	,358*** (,057)	,239*** (,070)	,234*** (,071)
N	675	268	268	162	162	107	107
R^2 / adj. R^2	,056 / ,051	,496 / ,484	,516 / ,499	,499 / ,486	,505 / ,483	,617 / ,577	,622 / ,569
F	13,192	42,806	30,532	39,126	22,459	15,474	11,757

Standard errors are presented in parenthesis

[1] LOG transformed.

[2] SQRT transformed.

* Significant at 0,1.

** Significant at 0,05.

*** Significant at 0,01.

4.4 Regression results for revenue

Table 7 reveals that model 1, the model containing only the sector and nature of good variables, does explain a relatively high percentage of variation in comparison to the creation speed. The first model shows that the control variables have a R^2 of 17,6%. Of the control variables, only the sector variable has a significant positive relation to the dependent variable (β = ,1,221; $p < 0,01$) which means that ventures in the alternative energy sector generate a significantly higher revenue than ICT ventures.

Model 2 and 3 both contain the human resources indicators. The latter also includes the control variables. Both models differ strongly in terms of explanatory power. The R^2 of model 2 is only 5,6% while the R^2 of model 3 is 23,9%. The observed relations between the human resources indicators and revenue differ considerably from the relations found between them and creation speed. None of the indicators in model 2 have a significant influence on revenue. In model 3 the timing of the first employee hire (β = -,154; $p < 0,10$) and the sector variable (β = 1,262; $p < 0,01$) have significant relations with revenue. The only observed relation of an independent variable is a negative relation between the timing of first employee hire and the dependent variable. A negative relationship like this would suggest that the later the first employee is hired in the creation process, the more revenue is generated in the year after the first revenue. However, the robustness of this relation is not very high as this is the only model in which this relationship is observed and the number of cases is low for the amount of variables in the model.

Model 4 and 5 contain capital resource variables and show peculiar results. The first model with just capital resource variables explains 10,1% of variation in revenue. The number of loans is the only significant variable (β = ,808; $p < 0,01$) in that model. It has a positive relation to revenue which suggests that when more loans are taken out, the amount of generated revenue increases. However, this relation is only observed in model 4 and not in 5 nor in model 7, the model with all variables. When adding control variables to the model, the R^2 increases to 23% with sector once more as the only significant variable (β = 1,138; $p < 0,01$). The irregular observations could be explained by the relatively low amount of cases compared to the number of variables in the models.

The explanatory power of model 7 is the highest of the models with revenue as the dependent variable with a R^2 of 27,1%. Nonetheless, neither model 6 nor 7 add any additional insights to what has already been observed in the partial models. None of the human resources indicators are statistically significant in either model and the number of loans is only statistically significant in model 6 (β = ,722; $p < 0,05$), the model where the sector and nature of good variables are not included. Therefore none of the hypotheses for the revenue dependent variable can be accepted.

Table 7: MLR regression results with revenue as dependent variable

DV: Revenue	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Control variables:							
ICT vs. AE	1,221*** (,177)		1,262*** (,278)		1,138*** (,344)		1,189*** (,352)
Service vs. product	,155 (,209)		,150 (,329)		,078 (,404)		,087 (,412)
Service vs. product & service	-,250 (,184)		-,275 (,290)		-,193 (,350)		-,235 (,359)
Human resources:							
Number of founders		-,103 (,121)	-,101 (,111)			-,074 (,161)	-,055 (,151)
Timing of first work by a founder[1]		,150 (,202)	,190 (,184)			,156 (,243)	,204 (,228)
Number of Employees[1]		,320 (,215)	,307 (,197)			,204 (,264)	,239 (,248)
Timing of first employee hire[2]		-,099 (,093)	-,154* (,086)			-,067 (,119)	-,116 (,113)
Number of service providers		,113 (,094)	,050 (,086)			,103 (,118)	,070 (,111)
Timing of first service provider hire[1]		-,057 (,262)	,033 (,241)			,158 (,375)	,226 (,352)
Capital resources:							
Number of investments by founders[1]				-,248 (,301)	-,296 (,285)	-,248 (,343)	-,287 (,321)
Timing of first investment by founder[1]				-,217 (,196)	-,232 (,185)	-,260 (,256)	-,264 (,240)
Number of loans[2]				,808*** (,299)	,479 (,303)	,722** (,322)	,376 (,321)
Timing of first loan acquisition[1]				,043 (,208)	,008 (,198)	,048 (,234)	,019 (,220)
N	294	122	122	85	85	85	85
R^2 / adj. R^2	,176 / ,168	,058 / ,009	,239 / ,178	,101 / ,056	,230 / ,160	,131 / ,014	,271 / ,138
F	20,674	1,177	3,902	2,250	3,294	1,119	2,032

Standard errors are presented in parenthesis

[1] LOG transformed.

[2] SQRT transformed.

* Significant at 0,1.

** Significant at 0,05.

*** Significant at 0,01.

4.5 Robustness checks

Several additional analyses have been run to test the robustness of the results presented in the previous sections. First, the full regression models for both creation speed and revenue have been estimated again with untransformed variables instead of the log or square-root transformed variables. The newly obtained regression results for creation speed were similar to the results presented above. The direction and the significance of the relations did not change for any of the variables except for the timing of the first employee hire which lost its significant relation to creation speed. While the explained variance increased from 62% to 72%, this model is ultimately worse as the assumptions for homoscedasticity and normality are violated. The model with untransformed variables and revenue as dependent variables does not give any new insights. The variable controlling for sector remains the only variable with a significant influence on revenue. The model also has a lower explanatory power with 21% versus 27%.

Second, univariate models were run to test the influence of each of the independent and control variables on creation speed and revenue individually. While univariate regressions are fairly similar to correlation analysis, they provide additional information on the relationship between two variables. Univariate regressions show how much of the variance in a dependent variable is explained by an independent variable and the regression coefficient reflects the mean change in the dependent variable given a one unit change in the independent variable. In the univariate models with creation speed as the dependent variable every single variable has a significant and positive relation to creation speed except for the dummy variable comparing ventures only offering services to ventures that offer both products and services. The number of cases in these models was much higher compared to the full model ranging from 167 for the timing of the first loan acquisition variable to 682 for the number of founders. New significant relations are also found in the univariate models with revenue as the dependent variable. The number of employees, service providers and loans have a significant positive influence on revenue and the timing of the first investment by a founder now has a negative relation on revenue. This implies that revenue is higher when more resources are acquired and when a founder invests into the venture early. From this, it can be concluded that the regression analyses presented in section 4.3 and 4.4 do not uncover all existing relationships between the predictor and dependent variables. This is due to the lower number of cases in the multiple linear regressions.

5. Conclusion & Discussion

After decades of studies, venture creation is still a process with a high failure rate and uncertain outcomes. This study sought to contribute to the existing literature on the venture creation process and to the RBV by studying the timing of resource acquisition as a predictor of venture creation speed and growth. It sought to answer the following question: "*How does the timing of resource acquisition influence nascent venture creation speed and growth?"* The RBV, which argues that venture performance is determined by its resources, formed the foundation of the theoretical framework. The influence of the timing and quantity of founder work, employees, service providers, founder investment and loans on creation speed and revenue were measured through multiple linear regression. This regression analysis was performed on a dataset containing a mix of new ventures in the alternative energy and ICT sector in a number of western countries.

The regression analyses with creation speed as the dependent variable showed that the timing of first employee hire, the timing of first investment by a founder and the timing of acquisition of the first loan have a clear influence on creation speed. The creation process is slowed down when any of these three is acquired later, rather than early, in the creation process. The high explanatory power (R^2 of ~62%) of the models further supports the conclusion that these three variables have a significant impact on the creation speed of nascent ventures. The analyses also show that early resource acquisition does not automatically lead to a higher venture creation speed. The most interesting example for this is the influence that the founder has on creation speed. While the founder is arguably the most important factor within nascent ventures, the influence of the timing in which the first founder starts working for the venture is insignificant for the speed in which the venture is developed. The findings of the regression analyses with revenue as the dependent variable differ greatly from the findings for creation speed. No conclusive evidence for any influence of timing of resource acquisition on revenue generated by nascent ventures was found. Surprisingly, the quantity of available resources seemed to be just as un-impactful on the revenue variable.

This study has two main limitations. The first limitation is that cases (or ventures) that did not acquire one or more resources, did not finish the venture creation process or generate revenue had a lower influence on the regression analyses results. This is a result of how the various variables have been calculated. The timing of resource acquisition variables have been calculated by measuring the time between venture conception and when a resource was acquired. When a resource is not acquired at any point, this timing could not be calculated and the data point was coded as “missing”. As a result, that case is not included in regression models with variables for which the case has missing data. This explains why the number of cases differs in every model in the results chapter. The implication of this is that the sample of which the regression results are noted in the results chapter are not entirely representative for the whole population of ventures in the “Perfect Timing” database. The results of the univariate robustness checks presented in section 4.5 support this as well. When all available cases in the database are used for each of the variables, other significant relationships between predictor and dependent variables emerge. These additional relations are however not conflicting with those found in the multiple linear regressions. The relations found in the MLR are thus robust, but it is likely that other relations are found as well when the methodological limitation of this study is overcome. This could lead to more hypotheses being accepted.

The second limitation to this study is that the assumption is made that all founders, employees, service providers, founder investments and loans are equal. Theoretically, this assumption cannot be made. Not one person is the same as the other and a loan of a million euros must have a different impact on a nascent venture than a loan of a thousand euros. There is also extensive literature giving evidence for how personal characteristics, especially in founders, influences nascent venture performance. This limitation could be the explanation as to why no significant relations were found between the variables and revenue and why the explained variation by the variables was relatively low. Revenue might not be dependent on the timing or quantity of the variables included in this study but more on the personal characteristics of founders, employees and service providers or the amount of investments and loans. Interestingly, the explained

variation of the creation speed was high and significant relations were found. This could mean that personal characteristics are not very influential on the speed in which ventures are created but that the timing of resource acquisition is the key variable.

While the study had some significant limitations, strong relations were found between the timing of the acquisition of some resources and the dependent variables nonetheless. This confirms the idea that theoretical frameworks explaining venture performance should consider dynamic measures besides the conventional static measures. The key limitation of this research was that there was no appropriate measurement of timing for cases which had not acquired a resource at the time of data collection. This resulted in a large amount of missing data and a sample that couldn't quite represent the population accurately. Multiple Imputation by Chained Equations (MICE) (Azur et al, 2011) could be used to fill in the missing data points that occur through the non-occurrence of resource acquisition as it estimates values for missing data based on the other variables in the dataset. Measuring timing with an ordinal variable based on different phases in the venture creation process could be another alternative measurement to reduce missing data. Once the key limitation has been overcome a more conclusive answer can be found to the question of whether timing of resource acquisition is the key determining factor of venture performance.

The main take-away for policy makers and managers of nascent ventures should be that employees, service providers, loans and the timing of founder investment are key for creation speed. However, it is unclear how these variables affect revenue or other performance indicators such as profitability for example. Before managers can use the findings of this study effectively, the effects of timing of resource acquisition on revenue and other performance indicators should be studied more. Additional research may find that, for example, early acquisition of resources could have negative effects on venture performance. The results of some of the partial models and robustness checks point in this direction.

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