The Entrepreneurs Education Level and Start-up Success

A study on the effects of a founders educational degree on start-up success

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Bachelor Thesis - BSc in Retail Management 2023

Abstract

Using a quantitative method his study empirically examines what effect the founders educational level has on the success of a newly founded business. In a dataset of 145 Swedish companies founded between 2010 and 2015 the study divides the companies in four groups reflecting the founders educational level. The key success factors of business survival, revenue growth, profit and solvency ratio are then compared between the groups. Mean comparison results show that the founder's higher educational degree has a significant correlation with both solvency and firm survival. These conclusions have implications for both human capital theory and signaling theory and can practically be used by future entrepreneurs, investors and policymakers to make better decisions. Finally, this study raises multiple future research questions that go deeper into the connection between higher education and start-up success.

Keywords: Start-up, Success, Signaling Theory, Human Capital Theory, Education Level

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Acknowledgements

Firstly we would like to thank our supervisor Alexander Mafael for providing us guidance in writing this thesis. Our gratitude also goes to the CFR faculty and staff that has endured our presence during the last three years with requests ranging from helping with SPSS to arranging christmas trees. Lastly, we would like to dedicate this thesis to our dear friend Hampus Alnered and wish him all the best in his recovery.

Introduction

Background

Today more and more people dream of starting their own business (Tidningen Näringslivet, n.d.) and at the same time Swedish education rates are higher than the average across Europe and still increasing (Oecd.org, 2020). With this knowledge in mind it becomes interesting for many future company founders to know which direction they should take in life if the goal is to start the next big company. One big question is if it is worth it for a future entrepreneur to get a higher education and it is this our thesis will look at. Our hope is that this research can have real world practical implications on how future entrepreneurs decide to gather knowledge for their future entrepreneurial endeavors.

Previous Research and Contribution

In previous studies researchers have looked at the founder's human capital as a factor when looking at the success of newly started companies (Bruderl, Preisendorfer and Ziegler, 1992; Ratzinger et al., 2017; Colombo and Grilli, 2010). The founders' education, measured as years spent at university, have in these studies often been a small part of a complex analysis of the founders general human capital. Previous research has also used signaling theory to look at how having a higher education degree works as a signal in situations where stakeholders have asymmetric information (Connelly et al., 2011). This research will be used to give context to and explain the results of our study.

The goal with our study is to isolate the education level as a factor and look at how much the actual degree matters. This means that our result will tell us how useful it is for an entrepreneur to finish their education and get a degree. This can be compared to most other articles on the subject who looked at human capital and not the act of getting a degree (Bruderl, Preisendorfer and Ziegler, 1992; Barro, 2001). Comparing our results against previous studies that looked at years studied will give important insights about if it is the years studying and the human capital gathered, the act of getting a degree and the signals that sends or a combination of them both that matters most when starting a business.

Furthermore our research has examined the current literature on what defines success for a new business venture and selected the measures that we found best capture success for an entrepreneur. We believe that the measures developed by us can be used as a basis in further research that wants to investigate how a factor relates to start-up success.

The purpose of this study is therefore to see if a degree of higher levels contributes differently and if it is better than a high-school diploma and what financial implications higher levels of education have on newly founded companies. To do this human capital theory and signaling theory will primarily be used. A quantitative method will be used and success will be measured by the comparison of key performance indicators of companies in four different categories, high-school, undergraduate, graduate and postgraduate level educated founders. The research question of this study is therefore:

- What effect does the founder's higher education degree have on start-up success?

Delimitations

This thesis will narrow its research to Swedish companies founded between 2010 and 2015. Hence, the study will look at a specific point in time in a specific country and the research will therefore not be generally applicable for other countries and timespans. Our selected time period is in between two major global crises, namely the 2008 financial crisis and the covid-19 pandemic which started in 2020. Furthermore this has been a period of low interest rates and stable growth for the Swedish economy (www.riksbank.se, n.d.).

The second delimitation of our study is that we only will look at the level of education, not the specific subjects studied. We have looked at four different educational levels and our study has therefore only looked at the level of formal education, not the subject matter studied. Furthermore, industry will not be a variable in this study since this is a study that analyzes start-ups on a general level in order to see the educational differences and not branch specific ones.

We have also narrowed down our definition of a successful company. As will be developed in the methodology section the definition of a successful company can differ substantially depending on who you ask. We will however only be looking at survival, revenue growth, profitability and solvency as key success factors.

Disposition

In this thesis we will first present a review of the current literature on the subject. Next our hypotheses are presented and in this section we will refer back to the previous conceptual background. Subsequently, the method used for our study will be presented followed by a detailed section about the results of our study. By the end of the report we will have a discussion section analyzing the results of our study and connecting the results with both theory and practical implication. Finally we will discuss the limitations of this study and suggestions for future research, ending with a conclusion summarizing the study.

Conceptual Background

Defining Start-ups

The definition of start-up companies that will be used in this study is companies that are new to the industry and that are not a result of diversification by other pre-existing companies, these companies are usually called De Novo. (Mueller and Hennicke, 2022). Another factor that is considered in this study is the age of the company since a start-up is usually considered as a quite new venture in comparison to SMEs that can have similar revenues but might be older. An article that uses age as one of many criteria for start-ups is Battisti et al. that has a criteria of the company being newly founded or less than 5 years old (Battisti et al., 2022).

The Relevance of Educational Degrees

The aim of our study is to look at how having a higher education degree relates to start-up success, however the question of higher education leads to favorable outcomes are widely studied. Research has found higher education to be positively related to a multitude of factors such as health, wealth and happiness (Hartog and Oosterbeek, 1998).

One of the biggest studies of the topics is the CHEERS project conducted in the late 1990s that was funded by the European Commission (Huber et al. 2010). This study tracked over 36000 students from 11 EU countries and Japan. The students were continuously surveyed three to four years after their graduation with the goal to evaluate how a higher education degree helped the students in their future careers. To summarize the findings from this study

could be a thesis on its own, however it makes it clear that completing a higher education degree is beneficial in most aspects (TEICHLER, 2007).

The CHEERS study did not look at entrepreneurship and start-ups when evaluating the outcomes of higher education. However, the study highlights the value of higher education and the benefits getting a higher education degree can give you. In this section we will present some different perspectives that can explain why higher education can be useful for a founder of a new business.

Signaling theory

Higher education can be viewed from the perspective of signaling theory. Signaling theory is a growing field within management research and deals with the issue of information asymmetry between different parties (Connelly et al., 2011). When it comes to new business ventures this becomes relevant as the entrepreneur constantly needs to communicate with different stakeholders and an important thing to communicate is competence. For a signal to be effective it needs to have a high signal cost. This means that it must be difficult for someone to falsely imitate the signal (Bergh et al., 2014). As getting a degree is a big commitment that takes years to achieve, the signal cost for getting a higher education degree is high and it therefore becomes a very effective signal. A higher education degree therefore sends a clear message that helps to signal that the entrepreneur has the ability to complete complex tasks and can commit to something for a longer time. This is supported by previous research that has looked at the signal value of higher education from an employer's perspective and concluded the signal value of higher education to be high. (Hussey, 2012; Arkes, 1999).

Human capital theory

Multiple studies have also shown the importance of the founding entrepreneur for the performance of firms in their early lives. One example is research done by Hormiga et al. that looked at a sample of 130 new companies and summarized their research by highlighting the entrepreneurs role when starting a new venture (Hormiga, Batista-Canino and Sánchez-Medina, 2010). This leads to the question of why the founder affects the company and how this connects to education level. One field of study we can use to answer these questions is human capital theory.

After doing a review of the literature on human capital theory Nafuko et al. argues that human capital theory “seeks to explain the gains of education and training as a form of investment in human resources” (Nafukho, Hairston and Brooks, 2004, p. 546). This conclusion is reached after reviewing how the leading experts in human capital theory have defined the field from the 1960s until today. Furthermore Nafuko et al argues that human capital theory takes the perspective that education and other experiences are deliberate investments that increase the productivity of individuals as well as organizations (ibid).

Based on the knowledge that human capital theory gives us, we can say that there should be some difference between companies founded by entrepreneurs with different levels of human capital. Additionally, because education level is an important factor that helps increase a person's human capital (Barro, 2001), human capital theory can be used to argue that a company founded by an entrepreneur with a higher education should lead to a more successful company.

Education's impact on the founder and the new venture

With the previous literature review in mind we will now go deeper in the current literature and look at the different ways the founder's education impacts the early stages of a company.

Company Bankruptcy

One of the most important factors influencing a company's survival is according to human capital theory the founder and the founders previous experience (Bruderl, Preisendorfer and Ziegler, 1992). This theory argues that the greater the human capital of the founder, the greater the chance of survival for a newly founded company. Based on surveys answered by 1849 business founders in Germany, Brüderl et al. argues that the characteristics that increase a founder's human capital are mainly work experience, industry specific experience and years of schooling (ibid). Here the last mentioned factor, years of schooling, is most relevant for us and the Brüderl et al. article shows a significant (significance level of 0.05) relationship between new business survival and the founders years of education.

The same result has also been found in other studies (Gimeno et al., 1997; Bates, 1990). One of these is Gimeno et al. who made a study that used a sample of 1547 entrepreneurs and new businesses and examined how the entrepreneurs' level of education affected the survival of

the business (Gimeno et al., 1997). Based on the results of this study the authors argue that individuals that have managed to persist in their studies until they obtained a degree are "more likely to persist in their business" meaning that they will find ways of keeping their business alive through difficult periods (Ibid).

Access to capital

Previous research has studied the fact that having a formal education makes it more likely to secure external equity financing while companies where the founders lack a formal education are more likely to rely on self-financing (Ratzinger et al., 2017). By using human capital theory and a sample of 4953 digital start-ups Ratzinger et al. shows that in some specific scenarios founders with a higher education will have an easier time to achieve their equity financing goals. These are when the founder has a technical higher education, when the founder has a doctoral business education, and when the founder has an undergraduate degree in arts and humanities. Looking at these three cases we can not generalize and say that a founder with higher education will have easier access to equity, however it gives some support that the right kind of education will help founders secure equity financing.

This same conclusion has been reached in other studies (Colombo and Grilli, 2010), one example is Colombo et al (2010). who analyzed the growth of 439 Italian new ventures and what aspects influenced their ability to get VC funding. Colombo et al. concluded that the founders with greater human capital (where education level is one part) has an easier time attracting venture capital then companies whose founder has a lower human capital (Colombo and Grilli, 2010). Based on these studies we can conclude that in many cases a founder with a university-level education can have a positive effect on the company's likelihood of receiving venture capital funding.

Founder education in relation to growth

Previous research from Colombo et al. (2005) have looked at how the founders' years of education relate with company growth. This study from Colombo looked at newly started Italian firms and using a sample of 506 firms they found no significant relationship between the founders' years of education related to the company's growth (Colombo and Grilli, 2005). The only fields where Colombo et al. found a significant correlation between education and growth is within economics and managerial fields (ibid). As only two fields of study have a correlation with increased growth this tells us that growth can differ between our four groups but it should not differ significantly.

However other studies have had other conclusions. Barringer et al. looked at 50 so-called rapid-growth firms and studied what set these fast-growing companies apart from companies that grew slower. In this study Barringer et al found that the most important factor was the founder characteristics and among the founder characteristics that stood out in the rapid-growth firms was that the entrepreneur was higher educated (Barringer, Jones and Neubaum, 2005). This tells us that there may be a correlation between the founders' education and growth after all.

Founder education in relation to profitability

Today it is hard to find any established research that looks at how the founder's education relates to the profitability of the company. However, Chandler and Jansen has conducted a study which looks at how the founders self-assessed competence relates to different performance measures, where profitability was used as a measure. By looking at a sample of 134 respondents the researchers did not find a general relationship between self-assessed education level and profitability. They did however find that a bachelor's degree in business related to firm profitability (Chandler and Jansen, 1992). This conclusion is similar to the previously mentioned Colombo et al. (2005) study who got a related result when looking at how founder education related to growth. And both studies point to a correlation between a business degree being useful for start-up success in a way that a general degree is not.

Another previously mentioned article is Barringer et al. that analyzed rapid-growth companies and came to the conclusion that rapid-growth companies are more common for higher educated founders. In turn, rapid-growth companies are less profitable than other companies because of the rapid expansion and thinly spread resources that make rapid-growth firms focus on narrower customer segments. Because these companies started by higher educated founders achieve higher growth and are more often classified as rapid-growth companies than companies started by founders with lower education. These start-ups started by higher educated founders often do not achieve short-term profitability due to their focus on growth (Barringer, Jones and Neubaum, 2005).

Success

The definition of a successful company will differ widely depending on who provides it and might focus on financials, culture or influence. There is however much literature and many

studies that provide metrics that can be used in order to provide an objective view of a financially successful company (Kim, Kim and Jeon, 2018). Our evaluation of the different ways of measuring success will however be discussed in the methodology chapter where we will also motivate why we will use each success factor.

Survivorship Bias

Survivorship bias is a phenomenon that can affect a study's accuracy that shows up during the collection of data. It entails that the data that has been collected has a bias towards the available. For example, when collecting data regarding companies, a survivorship bias would be that the companies analyzed are only companies that have survived during a certain period (Bertoni, Colombo and Grilli, 2011). This can cause the unwilling exclusion of companies that have not survived since the information regarding these companies would not be available. The exclusion of these companies can cause a biased result from the analysis since the companies that should be analyzed are not included.(Frankenberger and Stam, 2019)

Hypothesis'

H1

If we use the knowledge from human capital theory that says that education will increase the entrepreneur's human capital and affect the way they run a company we can deduct our first hypothesis.

H1: Companies where the founder has a higher education will generally be more successful than companies where the founder does not have the same level of education.

This is logical because if education has an impact on the founder and the founder has an impact on the company, then we can assume that companies where the founders have different levels of education will differ in some significant way from each other. Furthermore as education is seen as a positive that increases your human capital, the difference we will see should be that higher education gives the founder benefits.

H2

Based on the literature on company survival that concluded that companies where the founder has completed more years of higher education will have a higher survival rate we can reasonably predict that our study will show the same result. This is because of the fact that more years spent in higher education usually leads to a higher degree. This gives us the hypothesis that:

H2: Companies founded by an entrepreneur with a lower level of education will have a significantly higher bankruptcy rate then companies where the founder has a higher level of education.

H3

In the literature review we go over articles that talk about how education gives access to capital. These articles help us understand two things beneficial for our report. Firstly, it is another proof that the founder influences the company, further supporting H1. Secondly it helps us develop our second hypothesis. If companies where the founder has a higher education level more often reach external equity finance goals, then there should be a significant difference in the level of equity between our four groups. This also goes in line with signaling theory where higher education becomes a signal that helps communicate that the founder is trustworthy. Having easy access to equity should allow companies where the founder is higher educated to maintain a better solvency. This helps us develop our third hypothesis:

H3: Companies where the founders have a higher education will have a better solvency than comparable companies.

H4

Using our literature review as a starting point it is difficult to predict if we will find a relationship between higher education and growth. This is due to the fact that we have different studies testing related fields that have come to opposite conclusions about the matter. Mainly Colombo et al. (2015) that looked at Italian startups found no general significant relationship between founder education and company growth. However, using the Barringer et al. article that found founder education as one of the most important variables for

start-up growth as a base and keeping in mind that Colombo et al. (2005) found correlation between education and growth in some circumstances our hypothesis is that:

H4: Companies where the founder has a higher level of education will have a significantly higher growth rate than companies where the founder has a lower education.

H5

Our fifth and final hypothesis relates to profitability. Looking at current literature in the "Founder education in relation to profitability" section, it is difficult to predict how the founder's education will affect the company profitability, however, no research has found a positive relationship between founder education and profitability. The Chandler and Jansen article argues that there is no relationship between founder education and growth while the findings by Barringer et al. suggests that higher education can make companies less profitable. Due to the fact that no previous research have shown that higher education leads to better profitability we will formulate the hypothesis that:

H5: Companies where the founder has a higher level of education will not have a significantly higher profitability than companies where the founder has a lower education.

Methodology

Start-ups

In this study start-up companies are considered as De Novo companies, or companies that are a completely new company and not a branch from an already existing company. In order to exclude the companies that are simply a diversification, start-up companies that have more than 50 employees at the start of the venture will be excluded (Mueller and Hennicke, 2022). The companies also have to be under five years old, as previously mentioned in Battisti et al., 2022. We have therefore looked at companies between their third and fifth year of business.

Time Frame

The chosen time frame of companies is start-ups started between 2010 and 2015. Since the effects of the financial crisis in 2008 can have a significant impact on start-up success in

companies started both before and shortly after the crisis, 2010 was chosen as the starting year.

Another factor that affects companies and their financial performance was the Covid-19 pandemic that started in early 2020 (Centers for Disease Control and Prevention, 2022). Since the chosen time frame is the third to fifth year, the last year that a company can be founded is in 2015 due to the possibility of negative effects from Covid-19, regarding factors such as supply chains, during 2020.

The best way to eliminate possible effects from the financial crisis and Covid-19 pandemic, the chosen time frame is the five years from 2010-2015. Even though there might be differences between the years, this time period is the least affected with regards to the global crisis during the late 2000s and late 2010s.

Firm age

One factor that plays a large role in a company's success is the firm age (Witt, 2004). In order to eliminate the biases that come from having companies that are of different ages, all companies that are included in this study will be in the same age bracket.

As previously mentioned the chosen time that will be analyzed is the timespan of the third to fifth year in the start-ups. A three year period has been chosen because of its more objective view of a company's growth over time than a one or two year period. For example, three year annual growth of sales is a commonly used measure for start-up success. In order to get a reliable measure of the company's success it is also important to measure its survival after the first two years. A two year gap between the founding of the company and collected data is a conscious choice that will ensure that the analyzed businesses have matured enough to have proven its business idea (Witt, 2004).

Success

The success measures that will be used in this study are Solvency, Profitability, Revenue Growth and Survival (Delmar, McKelvie and Wennberg, 2013). This part will dive deeper into why these factors were selected.

Survival

To measure the success of a company, the first variable to measure is if the company has survived the first years of their life. A way to measure survival is by taking bankruptcy into consideration (Yli-Renko, Denoo and Janakiraman, 2020). If a company has gone bankrupt, the company has not survived, while if it has not gone bankrupt, it has. The reason why survival is closely connected to success is quite straightforward, if a company has gone bankrupt, the company ceases to exist and can therefore not fulfill other success metrics such as revenue growth and profitability and therefore fails with its purpose. Bankruptcy is therefore an important performance metric (Yli-Renko, Denoo and Janakiraman, 2020).

Revenue Growth

The metric revenue growth has been used as one of the variables that determine the success of the companies. According to a study by Mueller and Hennicke discussing success in new ventures, success is measured by the turnover growth during a 2- to 3 year period. This metric was used since it measures a firm's market success in an objective way. The study also included the average age of the companies, which was 4.359 years since this would reflect the company's maturity. Therefore the average turnover growth rate during the first years of a start-up would objectively reflect the financial success of a company. The turnover growth was measured from time period t to time period t + 1 which provides a growth metric that compares turnover on a year to year basis (Mueller and Hennicke, 2022). Due to the low profitability in the first years of a start-ups launch and lack of financial history, turnover growth is a suitable indicator for success for business start-ups (Wong, Cheung and Venuvinod, 2005).

Profitability

Another objective performance indicator is profitability which is a measure of the profit compared to turnover. Even though, as previously mentioned, profitability might be low for start-ups, it is an important factor to consider when measuring start-up success. An article that uses profitability to get an objective measure of success is Hormiga et al. 2011, that uses profitability as a complement to subjective measures of success (Hormiga, Batista-Canino and Sánchez-Medina, 2010). Mansikkamäki 2023, also discusses profitability and turnover growth as good metrics of measuring a company's performance. The article discusses the special relationship between profitability and turnover growth in younger companies.

Whereas high turnover growth is good for a company, it is usually not the only metric that needs to be high in order for a company to have a higher likelihood of success but rather what is needed is a high growth and profitability. As Mansikkamäki 2023 describes a company that only has high turnover growth will not survive long since a low profitability would in the long term lead to negative effects on turnover growth.

This effect does however, not apply to very young companies because of the fewer risks from non-profitable growth. Since smaller companies usually have small amounts of resources, both smaller amounts of money but also knowledge of other options to this blind growth, non-profitable growth is usually the most resource efficient (Mansikkamäki, 2023). Therefore, profitability is a metric that should be evaluated since the companies in this study are young but are growing towards maturity and therefore are in the stage of trying to focus on profitability. The profitability measures that will be used are Profitability for the third, fourth and fifth year since these metrics cover the relevant aspects discussed in Mansikkamäki 2023.

Solvency

A company's financial stability is not necessarily related to its profitability or growth, but rather equity compared to assets and debt is a better indicator of a company's financial stability. If a company is reliant on equity compared to debt, it will have more flexibility in times of hardship because it removes the risk of spiking interest rates and other factors that high-debt companies encounter (Mouzas and Bauer, 2022).

Therefore the solvency metric of equity divided by total assets will be used to evaluate the analyzed companies' financial stability. Equity and debt will also be analyzed separately in order to see the differences in sizes between these (Mouzas and Bauer, 2022).

Control Variables

In order to evaluate if the education level actually has an effect on the measures that have previously been identified as success measurements, it is necessary to include other factors that can have an impact on profitability and growth. The control variable that has been used in this study in order to see if there are other factors is founding year.

According to a study published by OECD, the SME and entrepreneurship financing climate is severely affected by financial instability in the world. Because of this, companies that are founded close to a financial crash will have a harder time receiving capital and growing their sales. Therefore, companies in this study that were founded shortly after the 2008 financial crisis, might have significantly lower growth and profitability rates. The control variable that will be used in this study is therefore the founding year. This will be done in order to see if the effects found between the different education levels is because of the different levels of education or a difference in founding years and is a matter of financial instability in the market (OECD, 2009).

Data Collection

To collect data this paper has utilized Dealroom.co. Dealroom is a near real time data platform that mines companies' online digital footprints to collect information and create a dynamic database with up to date information (van Meeteren et al., 2022; Startupsweden.com, 2023). It has information about 6000 Swedish start-up companies in all different regions of Sweden and covers most start-up fields. The database includes financial information about the companies, managerial information regarding ownership structure and founders but the most important factor is that it does not delete company profiles after they have gone bankrupt, but rather keeps it accessible. This again, decreases the possibility for survivorship bias (Berg, 2014; Bendig et al., 2022). Recently Dealroom has been used in multiple academic studies and has been deemed as a reliable database for information (van Meeteren et al., 2022).

Dealroom.co has been used as a database over Swedish start-ups and as a tool to find the educational background of the founders. A random number generator was used in order to find which of the companies on the website were supposed to be analyzed, by simply matching the randomly generated number with the company in the specified spot. To find the correct companies to be analyzed at Tech Ecosystems, we filtered for companies founded with less than 50 employees and also specified the highest level of education to not avoid overlap. After selecting a company we have thereafter manually collected the remaining information from their annual reports that are publicly available on websites such as Allabolag.

Due to the low frequency of high-school level educated founders on Dealroom.co, the website Allabolag was used to gather further information of high-school level founders in order to get a similar sample size as the other groups. Allabolag is one of the largest websites that provides financial and managerial information about Swedish companies, both public and certain private ones (www.allabolag.se, n.d.). All the information that has been gathered from Allabolag is information that they in turn have collected from the Swedish Tax Agency who have all annual reports from Swedish companies. The information taken from Allabolag is information regarding financial statements, bankruptcy and managerial information regarding the founders. The website Allabolag has been used as a way to gather information by other authors of journal entries such as Darmani 2015, who used the website because of its objective and accurate reporting of company information (Darmani, 2015).

The random number generator was also used in order to find companies that should be analyzed from Allabolag when high-school level companies were collected. Since there was no way of sorting for high-school educated founders on Allabolag, it was necessary to look up the founders after a company had been selected, and thoroughly research in order to conclude that high-school diploma was the highest achieved diploma. The method of random sampling was used in order to minimize the survivorship bias that can be created by using other methods of gathering data such as new articles or list publications of start-up companies (Bonini, Capizzi and Zocchi, 2019).

Research Design

One-Way ANOVA

In order to measure the differences between the groups, a mean comparison was made using a one-way analysis of variance (One-Way ANOVA). Because of the group sizes being bigger than N = 30 and of different sizes, a Scheffe post hoc test was used to measure which of the groups had significant differences. A p-value of <0.05 was used in the ANOVA test to prove significance. The mean comparison will be made with the companies that have not gone bankrupt, since the bankrupt companies do not have complete numbers of the fiscal years analyzed in this study. Therefore bankrupt companies will be excluded in the ANOVA. An ANOVA was used since the relationship between the different groups was of interest.

Variables

Table I

Variable Name	Definition	Calculation
Bankruptcy	Bankruptcy measures if the has gone bankrupt during the five first years of the company's lifetime	1 = Bankruptcy 2 = Survival
Revenue Growth	The increase in revenue from the previous year to year t	((Revenue t) - (Revenue t-1)) / (Revenue t-1)
Profitability	The net profit percentage of revenue	Net Profit / Revenue
Shareholder Equity Ratio (Solvency Ratio)	The amount of the total assets that are made up by equity	Total Equity / Total Assets
Equity	The Total Equity of a company	
Debt	The Total Debt of a company	
Founding Year	The year the company was registered at the Swedish Tax Agency	

Table I. Shows the variables used in the mean comparison, both dependent and control variables. Provided is the variable name, description of the variable and the calculation used to define it.

Hypotheses Confirmation

We will confirm a hypothesis if we find a significant relationship in the ANOVA test between our groups that are in line with the hypothesis presented. The level of significance and between what groups the significance exist will then be tested in a multiple comparison. If the significant differences then are in line with our hypothesis we will consider that hypothesis confirmed.

Results

This section on the report will go through the results from the research conducted by first presenting the results in a table and then explain the results in text. The first part of the results will show results connected to our hypotheses and later the results from the control variable will be presented.

Empirical Results

Table II

Variable (Mean)	High School (N=30)	Undergraduate (N=30)	Graduate (N=36)	Postgraduate (N=31)
Equity (kSEK)	2811.87	4832.00	24208.91	13558.84
Debt (kSEK)	10787.00	9454.17	12700.78	12883.29
Total Assets (kSEK)	9209.00	14286.17	36909.69	26442.13
Solvency	35.02%	45.44%	51.73%	58.74%
Average Growth Revenue Y3-Y5	386%	782%	9075%	520%
Revenue Growth Y3-Y4	508%	944%	17471%	581%
Revenue	263%	620%	679%	460%

Growth Y4-Y5				
Profitability Y3	-353%	-19121%	-69526%	-32428%
Profitability Y4	-222%	-4286%	-5121%	-40533%
Profitability Y5	-140%	-1487%	-896%	-19282%
Bankruptcy	0.75	0.83	0.97	0.97

Table II. Shows the results in the different variables in each grouping variable. The results are provided in thousand SEK, percentages and for bankruptcy the mean of company bankruptcies on a scale from 0-1 and shows the percentage of companies that survived.

When looking at the first variable measured which is the average revenue growth from year 3 to year 5, the mean for graduate level education is higher than all other education levels landing at annual average of 9075% times with undergraduate being second highest at 782% times, postgraduate being third at 520% times and lastly high-school graduates landing at 386% times. The revenue growth in year 4 and year 5 also has varying results between the groups but less extreme. In year 4 graduates had a mean of 17471% , undergraduate at 944%, postgraduate at 581% and lastly high-school at 508%. In year 5 graduate level had a mean growth of 679%, undergraduate had a mean growth of 620%, postgraduate at 460% and again last is high-school with a mean growth of 263%. These results did however not prove significant with the p-value for revenue growth year 3 to year 5 being 0.067, growth year 3 to year 4 being 0.158 and revenue growth year 4 to year 5 being 0.808.

The profitability in year three had a mean of -353% for high-school level founders, -19121% for undergraduate level founders, -69526% for graduate level founders and -32428% for postgraduate level founders. These results did however not prove significant with a p-value of 0.322. The profitability in year 4 had an average of -222% for high-school level founders, -4286% for undergraduate level founders, -5121% for graduate level founders and -40533% for postgraduate level founders. This relationship also had a non-significant p-value of 0.209. Lastly the profitability in year 5 had an average of -140% for high-school level founders, -1487% for undergraduate level founders, -896% for graduate level founders and lastly -19282% for postgraduate level founders. The p-value for these relationships were 0.055 which is not significant either.

Two factors that proved significant between certain groups was the relationship between total assets and education level but also solidity and education level. The average total assets for high-school founder start-up companies was 9209 thousand SEK. The average for bachelor/undergraduate level was 14286 thousand SEK. The average for graduate level was 36910 thousand SEK. The average for postgraduate level was 26442 thousand SEK. The p-value for this relationship was 0,005 which proves a significance between certain groups considering education level and total assets.

When it comes to solidity, high-school level founders had a mean of 35,02%, bachelor/undergraduate level founders had a mean of 45,44%, graduate level founders had a mean of 51,73% and lastly postgraduate founders had a mean of 58,74%. The relationship between solidity and education level also proved significant between certain groups with a p-value of 0,022.

The Results from the analysis of equity and debt showed that the average equity for high-school level founders was 2812 thousand SEK, for undergraduate level founders it was 4832 thousand SEK, for graduate level founders it was 24209 thousand SEK and for postgraduate it was 13559 thousand SEK. The significance level for the relationship between equity and education level was <0.001 and therefore significant for between certain groups. When it comes to debt, high-school level founders had an average of 10787 thousand SEK, undergraduate level founders had an average of 9545 thousand SEK, graduate level founders had an average of 12701 thousand SEK and lastly postgraduate level founders had an average of 12883 thousand SEK. This relationship did not prove significant with a p-value of 0.706.

Between the groups, bankruptcy rates were different between the groups with high-school level educated founders was 0,75 with 0 being bankrupt and 1 being not bankrupt. These results show that 10 out of the 40 analyzed companies with high-school level founders went bankrupt within the first five years of business. Undergraduate level founders had a mean of 0.83 which means that 6 out of 36 of the analyzed companies went bankrupt. The graduate level founder companies had a mean of 0.97 which means that 1 out of 36 companies went bankrupt. The postgraduate level founder companies also had a mean of 0.97 and out of the 31 analyzed companies, 1 had gone bankrupt. This relationship was significant between certain groups with a significance level of 0.007.

Since the relationship between education level and the variables equity, solidity, total assets and bankruptcy proved significant between certain groups, the results from the multiple comparisons should be analyzed to see which groups have significant differences.

Table III

Variable	**Founder Education (I)**	**Founder Education (J)**	**P-Value**
Equity Y5	High-School	Undergraduate	0.988
		Graduate	0.002
		Postgraduate	0.294
	Undergraduate	Graduate	0.006
		Postgraduate	0.483
	Graduate	Postgraduate	0.264

Table III. Shows the multiple comparison post hoc test and the group relationship significance levels for the variable Equity Y5. Founder education (I) is the group compared to Founder education (J) and all group relationships are presented once.

The results from the multiple comparison post hoc test for equity shows that one group has significant differences with two other groups, master level educated founders with high-school and bachelor educated founders. The difference between high-school and undergraduate educated founders has a significance level of 0.988, between high-school and graduate educated founders, it was 0.002 and high-school and postgraduate it was 0.294. The difference between undergraduate and graduate had a significance level was 0.006, between undergraduate and postgraduate the significance level was 0.483 and lastly, between graduate and postgraduate educated founders the significance level was 0.264.

Table IV

Variable	Founder Education (I)	Founder Education (J)	P-Value
Total Assets	High-School	Undergraduate	0.952
		Graduate	0.013
		Postgraduate	0.265
	Undergraduate	Graduate	0.064
		Postgraduate	0.574
	Graduate	Postgraduate	0.656

Table IV. Shows the multiple comparison post hoc test and the group relationship significance levels for the variable Total Assets. Founder education (I) is the group compared to Founder education (J) and all group relationships are presented once.

The results from the multiple comparison post hoc for total assets test shows that the difference between the groups were significant between two groups, undergraduate and graduate level founders. The difference between high-school and undergraduate level educated founders had a significance level of 0.952. The difference between high-school and graduate level founders had a significance level of 0.013. The difference between high-school and postgraduate level founders had a significance level of 0.265. The difference between undergraduate and graduate level founders had a significance level of 0.064. The difference between undergraduate and postgraduate level founders had a significance level of 0.574. Lastly, the difference between graduate and postgraduate had a significance level of 0.656.

Table V

Variable	Founder Education (I)	Founder Education (J)	P-Value
Solvency	High-School	Undergraduate	0.626
		Graduate	0.189
		Postgraduate	0.030
	Undergraduate	Graduate	0.876
		Postgraduate	0.411
	Graduate	Postgraduate	0.833

Table V. Shows the multiple comparison post hoc test and the group relationship significance levels for the variable Solvency. Founder education (I) is the group compared to Founder education (J) and all group relationships are presented once.

The results from the multiple comparison post hoc test for solidity shows that there is a difference between two different levels of education of the founders, high-school and postgraduate. The difference between high-school and undergraduate level educated founders had a significance level of 0.626. The difference between high-school and undergraduate had a significance level of 0.189. The difference between high-school and postgraduate had a significance level of 0.030 and therefore proved significant. The difference between undergraduate and graduate level founders had a significance level of 0.876 and between undergraduate and postgraduate level founders had a significance level of 0.411. The difference between graduate and postgraduate level founders was 0.833.

Table VI

Variable	Founder Education (I)	Founder Education (J)	P-Value
Bankruptcy	High-School	Undergraduate	0.735
		Graduate	0.032
		Postgraduate	0.045
	Undergraduate	Graduate	0.342
		Postgraduate	0.393
	Graduate	Postgraduate	1.000

Table VI. Shows the multiple comparison post hoc test and the group relationship significance levels for the variable Bankruptcy. Founder education (I) is the group compared to Founder education (J) and all group relationships are presented once.

The results from the multiple comparison post hoc test for bankruptcy shows significance in difference with one group compared to two others, namely high-school level with both graduate and postgraduate level. The difference between high-school and undergraduate level had an insignificant significance level of 0.735 while high-school and graduate level had a significant significance level of 0.032. The difference between high-school and postgraduate level was also significant with a significance level of 0.045. The difference between undergraduate and graduate level founders was insignificant at a 0.342 significance level, the significance level of the difference between undergraduate and postgraduate was also insignificant at 0.393. Lastly, the difference between graduate and postgraduate level was completely insignificant with a significance level of 1.

Control variable results

Table VII

Variable	Year	Mean
Equity Y5 (Thousand SEK)	2010 (N=2)	439.00
	2011 (N=4)	931.25
	2012 (N=8)	2560.00
	2013 (N=21)	17598.74
	2014 (N=38)	15998.32
	2015 (N=54)	9603.11
Bankruptcy	2010 (N=2)	2.00
	2011 (N=4)	2.00
	2012 (N=8)	1.80
	2013 (N=21)	1.75
	2014 (N=38)	1.84
	2015 (N=54)	1.96
Total Assets (Thousand SEK)	2010 (N=2)	6395.50
	2011 (N=4)	3184.50

	2012 (N=8)	20891.63
	2013 (N=21)	25114.74
	2014 (N=38)	25130.86
	2015 (N=54)	21819.73
Solvency	2010 (N=2)	11%
	2011 (N=4)	43%
	2012 (N=8)	10%
	2013 (N=21)	48%
	2014 (N=38)	56%
	2015 (N=54)	50%

Table VII. Shows the results from the ANOVA mean comparison test of the control variable. Provided is the variable name, founding year (Control variable) and the mean. The results are presented in Thousand SEK, Percentages and Company bankruptcy (Scale from 1-2).

In order to see if the education level has an effect on equity, solidity, total assets and bankruptcy and that the relationship previously seen in the results from the one-way anova the control variable previously discussed needs to be measured.

As seen in the table above the grouping years have different values in the analyzed variables. With regards to equity in year 5, 2010 had a mean of 439 thousand SEK, 2011 had a mean of 931 thousand SEK, 2012 had a mean of 2560 thousand SEK, 2013 had a mean of 17599 thousand SEK, 2014 had a mean of 15998 thousand SEK and lastly 2015 had a mean of 9603 thousand SEK. However these relationships did not prove significant with a significance level of 0.339.

Total assets for 2010 had a mean of 6396 thousand SEK, 2011 had a mean of 3185 thousand SEK, 2012 had a mean of 20892 thousand SEK, 2013 had a mean of 25115 thousand SEK, 2014 had a mean of 25131 thousand SEK and lastly 2015 had a mean of 21820 thousand SEK. The relationship between the different years and total assets did not either prove significant with a significance level of 0.852.

Solidity for 2010 had a mean of 11%, 2011 had a mean of 43%, 2012 had a mean of 10%, 2013 had a mean of 48%, 2014 had a mean of 56% and lastly 2015 had a mean of 50%. The relationship between certain years with regards to solidity did prove significant with a significance level of 0.003.

Lastly, when it comes to bankruptcy, 2010 had a mean of 2 meaning that all companies analyzed had survived, 2011 also had a mean of 2, again meaning that all companies analyzed that were founded in 2011 survived. 2012 had a mean of 1.8 which means that 8 out of the 10 analyzed companies survived. In 2013, bankruptcy had a mean of 1.75, meaning that 21 out of the 28 companies analyzed went survived. In 2014, bankruptcy had a mean of 1.84 which shows that out of the 44 analyzed companies, 37 survived. Lastly, 2015 had a mean of 1.96 meaning that out of the 56 companies analyzed that were founded in 2015, 54 survived. The relationship between year and bankruptcy did not prove significant with a significance level of 0.076.

Table VIII

Variable	**Year (I)**	**Year (J)**	**P-value**
Solvency	2010	2011	0.909
		2012	1.000
		2013	0.728
		2014	0.494
		2015	0.654

	2011	2012	0.667
		2013	1.000
		2014	0.979
		2015	0.999
	2012	2013	0.104
		2014	0.010
		2015	0.035
	2013	2014	0.955
		2015	1.000
	2014	2015	0.958

Table VIII. Shows the multiple comparison post hoc test for the control variable founding year. Provided is the Variable name, founding years and significance levels of the relationships between the groups. Year (I) is compared to Year (J) and each relationship is presented once.

The multiple comparisons show that the groups that have differences that are significant are 2012 and 2014 with a significance level of 0.01 and year 2012 and 2015 with a significance level of 0.035.

Discussion

In this part of the text we will first summarize and discuss our findings in connection to the hypothesis developed previously. We will then use the findings to discuss the practical and academic contributions of our results.

Summary of main findings

This part of the thesis will connect our results with the hypothesis that we based on the previous literature on the subject. The following table will summarize our findings and afterwards we will discuss each result.

Table IX

Hypothesis	**Description**	**Result**
H1	*Companies where the founder has a higher education will generally be more successful than companies where the founder does not have the same level of education.*	**Hypothesis Confirmed**
H2	*Companies founded by an entrepreneur with a lower level of education will have a significantly higher bankruptcy rate then companies where the founder has a higher level of education.*	**Hypothesis Confirmed**
H3	*Companies where the founders have a higher education will have a better solvency than comparable companies.*	**Hypothesis Confirmed**

H4	*Companies where the founder has a higher level of education will have a significantly higher growth rate than companies where the founder has a lower education.*	**Hypothesis Not Confirmed**
H5	*Companies where the founder has a higher level of education will not have a significantly higher profitability than companies where the founder has a lower education.*	**Hypothesis Confirmed**

Table IX. Shows the hypotheses and if the hypotheses were confirmed or not. Provided is hypothesis number, hypothesis description and if the hypothesis has been confirmed or not.

H1

Our first hypothesis stated that companies where the founder has a higher education will generally be more successful than companies where the founder does not have the same level of education. As previously discussed the answer to this question clearly depends on the definition of success used. However, using the definition we have outlined our first hypothesis holds in multiple ways. The significant relationships found shows that companies where the founder has a higher education are significantly more successful when using the balance sheet measures such as total assets, equity and solidity. Looking at the multiple comparisons we can see that the companies founded by a person with a graduate degree performed best using these measures.

Furthermore, as will be further explained in the next section, companies where the founder has a higher education have a significantly higher survival rate than comparable companies. As a company's survival is key for further success in all other aspects the increased survival rate is a strong argument for why this hypothesis holds.

If we use our income statement measures of success such as growth and profitability we do not find any significant differences between our four groups. Reasons for this will be

developed below, however we still argue that our first hypothesis holds as two of our four success measures had a positive relation with the founders education.

When looking at reasons for why this is the case we can say that this is consistent with the current literature and we especially connect our findings to the CHEERS study. Just like a higher education is beneficial when seeking employment, our study contributes with knowledge that says that the same conclusion holds when starting a business. Relating our study to human capital theory this is also logical as a person that has acquired a degree will have increased their human capital and therefore create more value as an entrepreneur.

H2

Our second hypothesis was that companies founded by an entrepreneur with a lower level of education will have a significantly higher bankruptcy rate than companies where the founder has a higher level of education. Based on the results this hypothesis is confirmed. The fact that 25% of the ventures started by entrepreneurs that only have a high school degree went bankrupt stands in sharp contrast to the companies where the founder had a graduate- or postgraduate degree. Looking at the multiple comparisons we find that there is significance in the bankruptcy rate between founders with a high school degree and both graduate degree and postgraduate degree.

On this point our research goes in line with the previous research that has been done and we can see how the increased human capital gained through a degree makes the entrepreneur more likely to keep the company alive. Looking at our results another possible explanation for this result may be the easier access to external financing that founders with higher education have. Applying signaling theory, a failing venture where the founder is highly educated may still communicate a trustworthiness that a founder that lacks a higher education can not. This also goes in line with our finding that companies where the founder has a higher education had a bigger share of equity financing.

H3

The third hypothesis in our paper argues that companies where the founders have a higher education will have better solvency than comparable companies. This hypothesis is confirmed if we compare the groups and companies founded by an entrepreneur with a

postgraduate degree that have a significantly better solvency than the companies founded by entrepreneurs with only a high-school education.

Building on the research we discussed in the literature review this result is not surprising and goes in line with previous research. As shown by Ratzinger et al. there are multiple scenarios where a highly educated founder will have an easier access to equity financing. This ease of acquiring external equity reduces the need for a company to rely on debt financing and the company will therefore have a better solidity.

When looking at why this hypothesis holds we can first take the perspective of human capital theory. The Colombo et al. (2010) article helps us understand that someone with a higher education will have accumulated sufficient human capital to be more efficient in their search for venture capital and this is most likely true for most types of equity financing. In the same way we applied signaling theory as an explanation of the results for our first theory we can use signaling theory as an explanation for why founders with a higher education attract more equity. The higher education will work as a clear signal to investors that communicate trustworthiness and bridge the information asymmetry between entrepreneur and investor.

One could question this explanation by the fact that entrepreneurs that have an easier access to equity also would have an easier time getting a favorable loan. Here, one assumption that could be made is that founders prefer equity investments due to the young age of the start-up companies.

Worth noting about these results is that our control variable, year founded, shows a significant relationship between solvency and the year founded. In the multiple comparison it is shown that the year 2012 had a significant difference in solvency compared to 2014 and 2015. This may be explained by the fact that the financial crisis in 2008 still had effects leading to difficulties in receiving equity financing (OECD, 2009). If there would have been larger samples in 2010 and 2011, these years would probably also have had a significant p-value.

H4

Our fourth hypothesis builds on research by Barringer et al. and Colombo et al. (2005) and states that companies where the founder has a higher level of education will have a

significantly higher growth rate than companies where the founder has a lower education. Looking at the results of our study this hypothesis did however not hold and we did not find any significant differences in growth rate between the groups during the timeframe we investigated.

Our result is similar to that of Colombo et al (2005) in the way that we did not find any general correlation between education and growth. We had expected that we would find at least a small significant difference between our groups due to the fact that previous research had found multiple subjects where years of education had an impact on growth. This in combination with the findings from Barringer et al. makes our results a bit confusing however we believe that the explanation for this may be the timeframe and context of our research.

This result is also interesting from the perspective of the results in our other hypothesis. We did find a significant relationship between the companies' access to equity financing and founder education and it would be reasonable that companies that investors believe and invest in would achieve higher growth. The fact that our study got different outcomes for these different variables is therefore interesting.

As mentioned earlier our time frame chosen can be an explanation for the results we got. The period between 2010 and 2019 is a period where interest rates have been low and debt financing has been cheap for many companies (www.riksbank.se, n.d.). This situation with low interest rates has helped stimulate growth for companies and this can also help explain the high average growth rate we can see for all the groups irrespective of the founders education. (Mankiw, 2021, p.57)

H5

Our fifth and final hypothesis stated that companies where the founder has a higher level of education will not have a significantly higher profitability than companies where the founder has a lower education. From our results we can see that this hypothesis holds due to the fact that we did not see any significant differences between our groups.

Although our hypothesis is confirmed, the result is interesting as our prediction builds on the fact that we assumed growth would have a significant relationship with education. We

believed that the high growth companies would be founded by entrepreneurs with a higher education and that these companies would have sacrificed profitability for growth as stated in the Barringer et al. article. Therefore we did not expect a significant relationship between profitability and education. However, as we did not find a significant relationship between growth and education this should also affect our hypothesis about profitability.

The explanation for our results may instead be that educational level simply does not affect the founder's ability to found a profitable company. At first glance this explanation does not go in line with the assumptions of human capital theory. However, it may be that entrepreneurs that skipped a higher education instead focused on other activities that increased their human capital related to entrepreneurship in the same way or even more than a higher education would have done.

Practical implications

Practically the results of our research can be used by investors when evaluating a company. Knowing that the founder's education affects for example the risk of bankruptcy, is knowledge that can and should be used when evaluating a company. In the same way, knowing that the founder's education does not affect growth or profitability is valuable information when looking at the founder's background.

The result can also be used by policymakers that want to encourage entrepreneurship. Knowing that higher education is a part of what makes a company succeed incentivises policy makers to put resources towards higher education. Even though our research did not find any significant relationship between growth and a higher education degree, our literature review highlights multiple studies that have shown that general business education is beneficial for founders that strive for high growth. This could also be a signal to policy makers to highlight the importance of general business knowledge in education.

Our study also sends a clear signal to future potential entrepreneurs. Our finding that companies founded by an entrepreneur without a higher education has a bankruptcy rate of 25% highlights that it is risky to found a company without first acquiring an educational degree. Our study could also support the signals a lack of a formal education sends out to investors which can be important information for founders to be aware of. All in all our

research gives future entrepreneurs new knowledge they can use when deciding if they want to pursue a higher education or not.

Important to notice is that the positive effects of a higher education is noticeable up to the graduate level, however, comparing the founders with a graduate and a postgraduate degree no such positive effect is found in neither of the investigated variables except solvency. This may speak to the fact that either the signaling effect is the strongest at the graduate level or that the gained human capital during postgraduate studies is not as high as the human capital developed in graduate students that instead spent their time working after getting their degree.

Academic contribution

Previous research related to early start-up success and the entrepreneurs role have mainly looked more holistically on human capital where years of education is a factor and found that this affects success, our contributions are however to narrow down and focus only on the effects of the degree and the different levels of higher education. Our research has therefore narrowed down the scope of human capital and by isolating education level as a factor we have contributed by giving a more detailed view of the subject. The results from our study does also help validate old research and confirm the results of similar studies during a different setting and timeframe.

Comparing our study that looked at getting a degree against previous research that looked at time spent at university, this study can contribute to the discussion of if it is the human capital gathered at university or the signal value of the degree that are the most important when studying. Here we can summarize our conclusion from the discussion about our hypothesis and say that for the income statement variables the human capital gathered at university does not help in improving growth or profitability. However when securing the companies survival or acquiring equity the educational degree matters.

Previous research on human capital theory that has looked at years of education such as Ratzinger et al. have only found a correlation between equity and some fields of study. This is in contrast to our study that found a general correlation between the variables. This can tell us that the signal value of a higher education degree is quite important as acquiring external equity is dependent on communication with people outside the company.

Because of the extensive research that has been put towards developing measures that reflect success of start-up companies in an objective way, it is possible for future researchers to use this paper's definition for future studies within this area. Our success definition considers profitability, equity in relation to total assets, growth and survival rate. These measures are usually used in research regarding success in start-ups, however, because the research analyzing educational effects are often connected to human capital theory they are not often combined. Therefore, the provided success measures build a good foundation for future research into the effects of education on start-up success.

Limitations and suggestions for further research

There are several limitations to this study regarding factors such as the measured variables, time frame or even sample size. Another example is survivorship bias. Even though we have tried to limit survivorship bias it is hard to limit completely and this of course becomes a limitation to our study. However, in this section these limitations will be discussed and suggestions for further research will be proposed.

The first limitation is regarding the variables measured. The limitation of not having enough control variables exists in this study. Only one control variable was used, which was the founding year of the companies since this could have an effect on factors such as a companies ability to gather capital. There are however more factors that can have affected the presented results that were not considered in the analysis due to the nature of this study. These factors include size, leverage, industry at the firm level and age, work experience, number of members of the founder team, previous start-up experience, etc. Some other factors that also could have affected the results that were not considered are personality traits of the founders such as intelligence, ambition or motivation. Furthermore, these other factors are also likely correlated with education such as intelligence and motivation. The lack of these control variables in the study therefore makes our research test the association between the highest educational degree achieved by the start-up founder rather than looking at education level as an isolated factor.

Our research has looked at how different levels of a founders general higher education degree have affected the founded companies success. In this paper we have not made any distinction

between different subjects or types of education due to our only objective being the academic level of the degree. This is a clear limitation and in future research it would be interesting to break down our results in more detail and investigate how the subject of the study affects success. The subject of the degree could, for example, contribute to the development of skills that are advantageous for starting a business if the founder has a business degree, while an engineering degree could contribute to the product quality. Therefore the subject area is important to have in mind while looking at the results of this study, since it probably has certain effects. In the same way the university of which the degree is from may also affect the results. Furthermore, this could be compared with the industry of the company. Since different industries will have different affecting factors, the industries of the analyzed companies will have different effects. Therefore the high differences in the data might be a result of industry factors and not educational ones.

As previously mentioned, to get consistency in our results we have defined a narrow timeframe with stable economic conditions. This is a limitation as our results may be different if we had selected a different timeframe with other macroeconomic conditions. An interesting future research subject would therefore be to replicate our study using a different timeframe. Questions that could be asked are for example if our results hold during a time period with high interest rates or during a financial crisis.

The sample size of this study is also worth discussing in the limitations. Due to time restraints the total sample size was 145 with the total count of valid companies (companies that have not gone bankrupt) being 128. Because of the amount of companies having gone bankrupt being quite high, the total number of valid companies is quite low. If the same experiment would be made with a larger sample size, the results could be different with certain groups since it might limit the survivorship bias effects. Therefore, future researchers should collect more data in order to get a more reliable analysis.

Conclusion

This study has focused on finding out what effects an entrepreneur's education level has on the success of the founded company. Previous studies have mainly focused on general human capital. The key difference between our study and previous research is therefore that we have isolated the founder's higher educational degree.

The analysis used a sample of 145 Swedish companies that were founded between 2010 and 2015 where the companies were divided into four groups depending on the education of the founder. Comparing these groups using factors relating to business survival, revenue growth, profit and solvency ratio we have found significant differences in business survival, and solvency ratio.

Our results suggest that a higher education degree is useful for entrepreneurs that want to start a business as it increases the survival chance of the new venture and increases the ease of which the company can acquire external equity. These results add on to the current literature of both signaling theory and human capital theory. Furthermore we develop a definition of success that we hope can provide a basis for future research on the subject.

This study is subject to limitation in terms of the sample size and the time frame studied. To narrow down the subject into a manageable scope Swedish companies founded between 2010 and 2015 were selected meaning that the general applicability of this study is reduced. Furthermore, our total sample size of 145 companies is a bit small, limiting the scope of our analysis.

In conclusion, our findings point to the fact that completing a higher education degree is beneficial for the entrepreneur's future success. Even though our study did not find a significant relationship between the founders' higher education degree and neither revenue growth nor profit, the significant relationships found between education level degree and both the firm survival rate and financial stability highlights that an investment in higher education is worth it for the founder of a new venture.

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