



DEGREE PROJECT IN INDUSTRIAL ENGINEERING AND
MANAGEMENT,
SECOND CYCLE, 30 CREDITS
STOCKHOLM, SWEDEN 2018

A company's ability Not to default on a loan

Does the location have an impact?

ALYCIA SUNDQVIST

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Alycia SUNDQVIST

Master of Science Thesis INDEK 2018:118
KTH–Industrial Engineering and Management
Industrial Management
SE–100 44 STOCKHOLM

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Har lokaliseringen betydelse?

Alycia SUNDQVIST

Examensarbete INDEK 2018:118
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Industriell ekonomi och organisation
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Approved 06-16-2018	Examiner Pontus BRAUNERHJELM	Supervisor Kristina NYSTRÖM
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Abstract

This thesis aims to answer the question if the type of region or category of a municipality in which a company is located in, impacts the company's ability not to default on a loan. Previous literature is used to find which determinants have an impact on a company's survival from five levels: Macro, Industry, Regional, Company and Individual entrepreneur. The data used is in collaboration with a financial company offering small businesses credit products. They have contributed with loan data. A statistical analysis has been done and the method used is a logistic regression, where the dependent variable is if the company is defaulting on their loan or not. The conclusions that can be drawn are that in correlation with the previous findings the age of the firm, employees, and capital had a positive relationship to a company's probability of not defaulting. Furthermore, the regional factors does have an impact on a company's ability not to default on a loan. The commuting regions have a positive relationship to the probability of a company's ability not to default on a loan.

Keywords: Location, municipality, ability to pay, logistic regression

Sammanfattning

Denna masteruppsats syftar till att svara på frågan om typen av region eller kategori av kommun ett företag är belägen i, påverkar företagets förmåga att inte återbetala ett lån. Tidigare forskning används för att finna vilka faktorer som påverkar företagets överlevnad i fem nivåer: Makro, Industri, Regional, Företag och Individnivå. Den data som används kommer från ett finansiellt företag som erbjuder småföretag kreditprodukter och har därmed bidragit med lånedata. En statistisk analys har gjorts och den använda metoden är en logistisk regression, där den beroende variabeln är om bolaget har kunnat återbetala på sitt lån eller ej. Slutsatserna som kan dras är att i linje med tidigare forskning där företagets ålder, antal anställda och kapital haft ett positivt inverkan på ett företags sannolikhet att kunna återbetala ett lån. Dessutom har de regionala faktorerna påverkan på företags förmåga att kunna återbetala ett lån där företag i pendlingsregionerna har större återbetalningsförmåga.

Nyckelord: Lokalisering, kommun, betalningsförmåga, logistisk regression

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Nomenclature

Firm, company – These terms are interchangeable

Survive – A company that is not terminated by any definition

Default – “A failure to do something that you legally have to do, such as pay a debt; the fact of not paying interest or other money that is owed on time” (Cambridge Dictionary, n.d.)

SME – **S**mall and **M**edium-sized **E**nterprises **SNI** – Swedish Standard Industrial Classification

Acknowledgment

First, I would like to thank Froda for giving me the opportunity to use their data in this thesis.

Secondly, I would like to especially thank my colleagues Sandra Attermo and Johanthan Johansson for helping me during this project. They have taken the time to acquaint themselves with my inquiries and answered all my questions with a smile.

Thirdly, I would like to give a big Thank You to my supervisor Kristina Nyström for heartily involving herself in my thesis and supporting me throughout the process. She has been tough, but fair, and pushed me to finish this thesis. Without her dedication to the subject and fast response, this task would have been much more troublesome.

Lastly, I would like to send some love and thanks to all the people around me for all the support and encouragement to finish this, thesis and with that, my years at KTH. A special thanks should also go to Anna Berggren for putting up with me these last years and especially during this thesis. Thanks for listening to my challenges and obstacles and discussing them with me, but also for all the coffee breaks and always making me smile.

1. Introduction

In this chapter, an introduction to the topic will be presented. This chapter will also include the problem description and purpose of this thesis. To create a better picture of the problem at hand, the research question will be stated along with the limitations. Finally, an outline of the thesis will be constructed to give the reader an overview of the structure.

“At its core, banking is not simply about profit, but about personal relationships.”

Felix Rohatyn

As Rohatyn (2010) states, an important part of banking is the relationship between the customer and its bank. Historically, the bank’s offices have been spread out all over Sweden and the bank officials personally know their customers. Along with digitalization and the increase of Internet access, bank offices have been closing down (Lindberg, 2015). One of the fallouts has been that the bank officials no longer have a personal relationship or have the same level of personal relationship with their customers as before. The relationship between the bank and their customers is very important according to Leif Östling, the former chairman of Svenskt Näringsliv (Svenska Bankföreningen, 2016).

This because companies, at some point, are in need of financing to grow and when times are tough the need for financing could be crucial for their survival. With a good relationship with the bank, the companies can receive financial support even though, at first glance the situation does not look promising. The company receives a loan as a result of a good relationship with their bank official where the customer has shown good behavior in the past. Furthermore, the bank official has good knowledge about the company and understands the customer and their importance of support at the right time for the company to survive.

Backman and Karlsson (2013a) and Nyström (2006) state that there are some correlations between the municipalities in Sweden and the rate of entry and exit of companies. There are also acknowledged theories on where new companies form and how they cluster together to enhance their benefits (see section 2.1.2). The question is how much these spatial determinants have on a company’s survival and if they are worth considering in the application process of a loan. In this thesis, the location aspects will be studied if they have an effect on the company’s ability not to default on a loan.

The determinants of bank loan default can be defined as on different levels. For example, recession and inflation are on a macro level while demographic factors such as immigration and

emigration are on a regional level. Depending on what type of company that is evaluated, the different spatial determinants might have more or less effect. If a company relies on physical customers, then a decrease of customer base due to migration might have a negative effect. On the other hand, if a company relies on transport and the roads are sufficiently improved, then this might also improve their success. These factors will be further discussed in section 2.2.

1.1 Problem description

As mentioned earlier in section 1, there are less bank offices and digitalization in society increases (Lindholm, 2016). Customers need finance either for new projects or stabilize their position. But retrieving financial support from banks is difficult and often a lengthy process for smaller businesses (Företagarna, 2015). Furthermore, after the financial crisis in 2008 banks have tightened their processes and become more restrictive with to whom they will grant a loan to and how much will approve (The Economist, 2018). As a result of this, the companies that already have a difficulty receiving a loan experience an even larger obstacle trying to retrieve financial support.

As banks are slow and the process is tedious and complicated, a new business segment has emerged, fin-tech, which combines financial services with innovative technology where these services are more user-friendly, have good service, lower fees and faster service (Goldberg, 2016). What happens when the customers need financing quickly but do not have an office nearby? How well will the bank know their customers?

The quote by Rohatyn (2010) in the introduction of this thesis emphasizes Wallander's view (Henrekson and Söderström, 2016) on placements of bank offices. Wallander believed that it was important for the offices to remain close to their customers and therefore constantly preserve a good communication. As about two-thirds of small companies started do not survive the first five years (Theng and Boon, 1996), how should new financial institutions make a worthy assessment of a company that they have never met or seen? How should they be able to give customers a good price when the evaluation needs to happen quickly and at a distance? The population is moving from the rural areas into the larger cities, decreasing the population in some municipalities. Therefore offices are closing, increasing the difficulty for the customer to communicate with their bank. This aggravates the possibility for the customers to have a relationship with their bank and can affect the company's well-being. New companies might not choose to locate in these areas and a negative spiral is initiated.

As most new firms are Small and Medium-sized Enterprises (SME) (European Commission, 2018), they tend to face the same obstacles and one of these obstacles is finance (Christie and Sjoquist, 2012). Banks demand lengthy descriptions and business plans and the process is long and tedious. Banks have used scorecards for consumers on a long-term basis as a way to evaluate a new customer and predict their ability to pay their debt. What if the same thing could be done for companies, incorporating the spatial determinants to increase the knowledge about the area. This could get some of the "church tower principal" back, which states that banks could only loan to customers that they could see in the vicinity of the church tower, so they would have a good knowledge and relationship with their customers.

1.2 Purpose and research question

The purpose of this thesis is to examine and evaluate the accuracy of spatial determinants in predicting a company's ability not to default on a loan.

Today, a lot of factors are considered when making the decision regarding if a company should get a loan or not, but the category of a municipality the company belongs to is overlooked (Backman and Karlsson, 2013*a*). As spatial determinants might have an impact on a company's survival rate, they should also be able to function as a prediction of a company's credibility together with other factors. If the category of municipality can help predict which company will default on their loan or not, this might also help to indicate if a company will fail and that the banks or other creditors will lose their investment.

R1: Does the municipality in which a company is located affect their ability to default on a loan and therefore have a higher risk of failing?

This will be done with using data from a credit company specialized in loans to SMEs consisting of data from loan applications from 2016 and 2017. There will be company-specific data and some data point of the individual behind the company. Furthermore, the focus will be on additional regional data for each specific category of a municipality, thus hoping to answer the research question: If the municipality affects the company's ability not to default on a loan.

1.3 Research contribution

Using specific loan data is a considerable contribution as this data is rarely displayed. To access data on individual companies and their loan data to use in a thesis or other report is difficult to obtain as credit intermediaries or banks do not wish to distribute this data. The analysis is often done within the institutes and they might, if even, only present the results. Previous studies have used data that is available in different public databases, where only the overall performance and survival is available. There is also an opportunity to obtain more company-specific data, containing annual financial reports of the companies in question but this data will not show how a specific company performs on their loans.

The research contribution of this thesis is that the regional factors will be evaluated depending on what category of a municipality in which the company is situated. Previous studies have been made on all 290 municipalities in Sweden (Nyström, 2006; Backman and Karlsson, 2013*a*) where the focus have been on exits and not loan defaults.

Instead, this thesis will focus on the nine different categories of municipalities. The benefits from this will be that all the companies that have similar spatial determinants will be evaluated together. Evaluating the categories together with the company-specific loan data should give a more detailed view of how the companies really is affected by their location. This will contribute to the definition of certain factors that are significant to improving the ability to evaluate a company. As the process to evaluate the company improves, risks can be predicted and better assessments can be made to help the customer.

1.4 Delimitation and Limitation

The delimitations of this thesis will be to companies in Sweden in the spectrum of micro to small companies included by SME's, as these are the customer base for the retrieved data. For the spatial data, the delimitations are set to data mostly from 2017 and in some cases from the most recently concluded data. There is also data showing the change during the last ten years. In regard to this, all sizes of companies will be used but delimited to corporations, sole proprietorship and partnership and limited partnership, as these are the most common.

The limitations of this thesis are closely correlated with the company-specific data that is used. As the company providing the data is relatively new there will not be historical data beyond the year 2016. The majority of the data is from 2017. Also, there is a limitation to the choice of companies studied and sampled. The companies that have applied for a loan have generally found out about Monetise Capital AB, (below referred to as "Froda") which is the primary brand used for the small business credit product through online marketing. A few customers have also been referred by existing customers. The applicants have then been evaluated and a decision was made if they should receive a loan or not. There is, however, a limitation in regards to that the companies included in the data are overrepresented in some types of industries, especially in restaurants and commerce. Therefore, the data is a bit bias and does not represent the whole of Sweden. The limitation in respect to companies also corresponds to companies having regular revenue transactions, as this is a requirement for the companies to make the application.

1.5 Sustainability

Sustainability is often evaluated from three different views; social, economic and environmental. To evaluate sustainability through these the dimension was concluded by the United Nations in their Agenda for Agenda for development:

"Economic development, social development and environmental protection are interdependent and mutually reinforcing components of sustainable development."

— United Nations (1997)

The purpose of evaluating these perspectives is to achieve a higher quality of life for the citizens. If the categories of municipalities show to have an impact on the company's survival it can have a positive outcome for the future. If the results are incorporated in the evaluations of a company at the application stage this might contribute to a better evaluation. If the evaluations are made more precise the right amount can be distributed and companies can get help with their finance in a more healthy way, hopefully with better prices for the customer. In this thesis the social and environmental implications are limited. The implication of this thesis is primarily on economic sustainability.

1.6 Outline of the thesis

In chapter 1, an introduction to the subject will be made to create a foundation and a starting point. It will also provide an explanation why the subject at hand is important. The problem description focuses more on the specific questions aimed to be answered followed by the limitations of the thesis. Lastly the outline for the thesis, this section, will function as a short description of the different chapters and their content to enhance clarity.

In chapter 2 the theoretical framework will be presented where the determinants of a firm's survival will be displayed. Findings from the previous literature will be discussed and the theoretical foundation for the thesis will be formed. Lastly, a summary will be offered to clarify the findings.

In chapter 3 the method of choice will be described and explained to make it possible to replicate in a later trial. This chapter will also contain the data and variables that are included in the data. They will be described and defined to such extent that they can be verified and used in later analysis's to replicate the process.

In chapter 4 the empirical results will be displayed and then discussed as to how well they correspond with the theoretical findings in chapter 2. These two parts will be in the same section to make the evaluation of the results more clear and comprehensive.

In chapter 5.1 the outcomes of the thesis will be summarized and the final conclusions will be drawn, giving a clear picture of the results. Furthermore, the possibilities of future studies on the subject will be presented, describing what areas could be interesting to study further to gain more knowledge on the subject.

2. Theoretical Framework

In this chapter, the theoretical analysis of the thesis will be proposed. The importance and relevance of the problem discussed will be presented, along with previous findings. The chapter will focus on the factors that affect a company's ability to survive and highlight the regional determinants. Previous theories will be presented and will create the foundation on which to analyze and then draw conclusions from the results while moving forward.

2.1 Location Theory

The theories on geographical or locational reasonings are many, but the reasoning of how these affect a company's survival is not extensive. However, during the last decades, the interest has increased among researchers. A company's entry, growth, and exit is extensively analyzed by researchers, but the spatial determinants defining the area where the company conducts their business have been overlooked in these analysis Frenken et al. (2014).

Globalization and the Internet have made it easier not only to communicate over vast areas but also ship goods relatively fast and reliable. As the productions of goods and services increases, so does also the interest in the most favorable locations for a business (Backman and Lööf, 2015). Previous researchers, Porter (2000), Kuah (2002) with others have long stated that regional factors are significant and that a gap exists in the literature. Regional factors are often left out in empirical studies regarding entrepreneurship and the focus is instead on the demographics and individual level (Backman and Karlsson, 2013a).

However, there are theories on what benefits there are to accumulate for companies located in the same area and is often referred back to Marshall (1890) and his agglomeration theory. Marshall (1890) suggested that there are spillover effects from locating in the same area, such as cost benefits, sharing knowledge and intermediate suppliers. This will create advantages for companies in these areas. But as digitalization increases and the availability of services online is made easier, there is a shift in how and where customer offices are located, especially in the banking industry.

Geroski (1995) states that entry is rather easy, but survival is not and it takes a few years for a newly founded company to mature and many firms do not survive the first period. Then what are the factors for a firm's survival? The Resource-Based Theory is well established to try to understand which factors are present and how they affect the firm's competitive advantage both internally and externally. The theory is used to illustrate and clarify the organizational

structure and processes, as well as the management experience (Barney et al., 2011). The firm's different strategic choices will generate outcomes that vary with respect to their initial choice.

Therefore, a company's chance of survival is directly correlated to their ability of to develop resources and intensifying their competence and effectiveness (Esteve-Pérez and Mañez-Castillejo, 2008). Furthermore, the survival rate of a firm and hence, the exit rates vary across the different industries. Frenken et al. (2014) also state that it is easier to initiate a firm than make it survive as the barriers for survival is higher. The different determinants that are mentioned in section 2.2.1 thru 2.2.5 have their foundation in this theory, together with the cluster theory mentioned in section 2.1.2.

2.1.1 Digitalization and its effect on the banking industry

As of today, digitalization and digital transformation are settled concepts that companies are getting more acquainted with. Although digitalization in many ways enables companies to grow in scale and reach out to new customer segments, some companies experience a challenge to maintain their market position as they have not yet embraced the transformation fully. (Bearing Point, 2017)

A totally new segment of the business has emerged, e-commerce. While some companies, such as Amazon, have had huge success and benefited from digitalization and a centralized approach (Strategic Direction, 2012) the transition has not proven to be as easy for other industries, one of which is the banking industry (Bearing Point, 2017).

In a study made by Bearing Point (2017), the banking industry is ranked in the lower half of industries in regards to their performance in digitalized solutions. Furthermore, their biggest obstacle to overcome is their challenge with e-commerce. Banks are not able to offer live chat with their customers to a sufficient level and have low activity on social media. Of course, different banks are at different levels, but this is the overall view concluded in the study. Even so, Swedbank, Nordea, and SEB have closed 250 offices all over Sweden in the last 10 years (Lindholm, 2016). This might even amplify the need to take regional aspects into account as they cannot communicate fully with their customers.

Handelsbanken, on the other hand, opened eight new offices during the same time period (Bearing Point, 2017). Handelsbanken recognizes themselves as decentralized with a long customer relationship approach. The different offices have their own management as if they were separate entities. Working processes are the same as in a centralized bank but bigger decisions require confirmation from higher levels (Cäker and Siverbo, 2014). This way of working was implemented by Handelsbanken's former CEO Jan Wallander, who changed the bank from being centralized to decentralized according to "*the church tower principle (kyrktornsprincipen)*", which states that the regional office only has responsibility for loans and credits of the customers that they can "see" from the church tower (Henrekson and Söderström, 2016).

Therefore, with a lack of regional offices, the way of evaluation of companies might need to change and the regional determinants should be of more importance as these were previously known by the bank officials and not included in evaluations. Memmel et al. (2012) state that industry and regional analysis in a joint statistical measure are rare, but concludes that the

regional factors do affect the loss for the bank. This does not only have an importance for banks, but also for all financial entities that do not have a personal relationship with their customers.

2.1.2 Cluster theory

The theory of clusters has been a topic discussed by a number of researchers for a long time. Albert Marshall was one of the first to mention clusters in his *Principles of Economics* from 1890. Since then, the views on clusters and their impact have differed, but a view that is both acknowledged and criticized is Michael E. Porter. His framework is used to pinpoint a company's position in their own sector of the industry to be less vulnerable and exposed to competitors (Porter, 1979). Porter has since then been developing his model to also function as a tool to analyze clusters and interactions between the companies in the clusters and is used by the EU and governments in different parts of the world (Swords, 2013). His own definition of clusters:

“Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate.”
— Michael E. Porter (2000, p. 15)

The geographical boundaries can be set by the observer, as long as it is defined by efficiencies that occur in the respect of information, transactions, and incentives. The boundaries can be set to a region, state, city or even larger as to a country or several countries. Silicon Valley is a great example of an area that has been defined by a cluster (Porter, 2000). The clusters are an optimal place for new companies to settle down as they can draw benefits from existing infrastructure, knowledge and innovation. Another example of clusters is the cotton industry in Britain or the financial cluster in London (Kuah, 2002).

The essential fact about clusters that makes them efficient, is that they need to include different industries to create the great spillovers, increase productivity and innovation. While the definition of the cluster is set to different industries and institutions the complementary effects are beneficial for all the companies within the cluster. On the other hand, if the cluster is set to the same industry, the pros are reduced and instead the competition is raised and can even have negative effects.

Figure 2.1 on the next page, shows Porter's diamond, that is often referred to as a theory to locate and describe the competitive advantage locally. According to Porter (2000), clusters are a new way to look at the economy and better organizing the economic development in the ways of setting public policies, expansions, and implementations. He also states that in a way, globalization has enabled companies to relocate to low-cost areas and the competitive advantages still seem to be local.

Porter's diamond model and his cluster theory have been criticized for being too general, undefined and not as applicable as desired (Swords, 2013). This model is general and it has been seen by some as a good initial step to define clusters. If a cluster is solid and has a lot of weight, it can attract other firms, and with a certain innovation level, it will be easier to

attract more innovative firms. In some cases, the clusters tend to allocate in areas where the infrastructure is well developed and the knowledge and experience of potential employees are high, for example near or in cities. However, it can be the other way around, where experience, innovation, and a whole community is moved to and built up around a cluster of firms. Silicon Valley, earlier mentioned, is considered one of those.

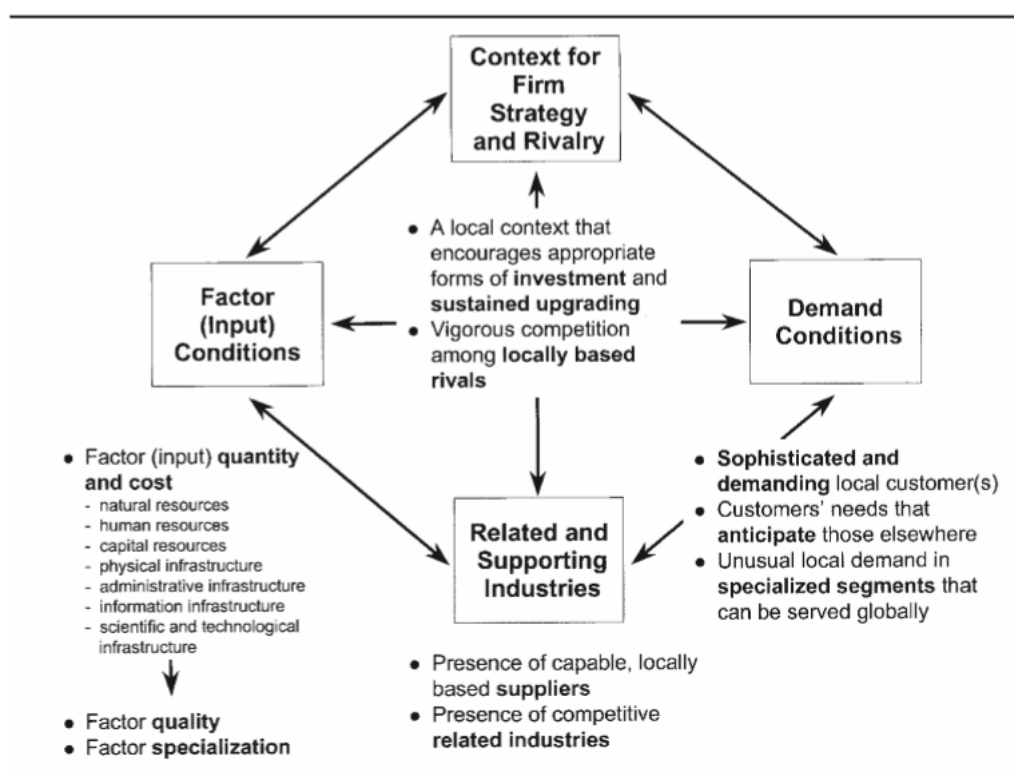


Figure 2.1: Porter's "diamond" of sources of locational competitive advantage (Porter, 2000, p. 372)

While making an attempt to analyze a country's spread of companies and their ability to not default on a loan, this theory could be a good indicator. The theory could explain how and why companies form in certain ways and could point to areas where a deeper analysis could be made. Conclusions that could be drawn is that if a number of companies within the same industry in the same region default, this could point towards the competition is too high. On the other hand, if a number of companies in different industries in the same region default, this could point to the fact that a larger event affecting the whole cluster is arising.

There are studies that show both positive and negative of from clustering. The density could have a negative effect, but co-location can also have a positive effect with spillovers, such as knowledge. However, concluding the findings it seems like clusters with the same type of industry have a higher risk of failure then clusters with related types of industries. Also a higher level of employment indicates higher rate of survival. (Frenken et al., 2014)

2.2 Five levels of determinants of survival

There is extensive research on the determinants of entrepreneurship and the creation of firms in the past. Unfortunately, the research on regional factors while evaluating entrepreneurship is not as extensive (Backman and Karlsson, 2013*a*). Studies have been slowly emerging on the spatial determinants affect on companies and during the short time frame of a few decades, the literature has shifted. It has shifted from emphasizing the importance of, and proving that regional determinants actually exist, to evaluating the different factors' impact on a company (Watson and Everett, 1993).

After examining different countries in both Europe and North America, a conclusion could be drawn that there are some similarities in spatial determinants (Acs and Storey, 2004). In the different studies made on spatial differences for entry and exit, three factors are reoccurring as the most identified: local demand factors, the supply of founders and the policy environment (Nyström, 2006). They can be translated into a macro perspective and regional determinants that need to be evaluated. Additionally, there are three different levels that can be evaluated in the aspect of the survival of a company: industry level, firm level and individual level (Parker, 2009*b*). The outline of the different levels of determinants that will be described and evaluated is as follows:

- Macro-level
- Regional level
- Industry level
- Company level
- Individual level

There are many different studies done on the determinants of entry and exit and the three factors mentioned above (local demand, a supply of founders and policy environment) are focused on entry and exit and it is not a given that these are important for the survival of a firm. There are also a significant number of studies made on the factors of becoming an entrepreneur. However, the regional determinants that affect the survival of firms are overlooked and not significantly examined according to Backman and Karlsson (2013*a*). As much of the previous literature has a slightly different view, all of the factors might not correlate to the survival of a firm but they are certainly interesting to evaluate. Thus, they will be considered and incorporated in the following sections.

However, for this thesis, the different categories of municipalities will be used as variables for evaluation and not a specific municipally. Furthermore, Kotey (2016) finds that location factors are important when exiting, such as small and aging population and crime. But the study made in Australia shows that these can be overcome with planning. Kotey (2016) also concludes that a determined business owner whose main focus is not to make a lot of profit survives. Their passion is instead their business and contributing to society becomes more important rather than pursuing large profits. This might have some correlation with Backman and Karlsson

(2013a) findings that owners that live and work in the same municipality have a higher survival rate while contributing to their society even though profits are low.

To understand what determinants affect the company's ability to survive they have been sorted from the broadest perspective to the most narrow, starting with the macro level.

2.2.1 Macro level

Both Everett and Watson (1998) and Theng and Boon (1996) state that *interest rates* are associated with bankruptcy and firm failure. Theng and Boon (1996) continue to access that *recession, inflation, taxes* and *government regulations* are important factors that affect a firm's survival. In the case of these factors is the reason for a firm's failure, the government policies regarding the company's economic environment should be evaluated and changed (Everett and Watson, 1998). However, these policy environment determinants are difficult to disclose and measure in a quantitative analysis as they are problematic to detect and not practically disclosed (Nyström, 2006).

Theng and Boon (1996) wrote "*An exploratory study on factors affecting the failure of local and medium enterprises*" in Singapore. The conclusions that could be drawn were that the owners saw taxes and high interest rates as big factors for business failure, which is aligned with findings in section 2.2.3. They also listed the employee's lack of knowledge of the company's product as a significant factor for failure. On the other hand, they did not rank education as being significant. This disputes other findings regarding education presented in section 2.2.5. What also needs to be taken into account is that the social behavior in Singapore might differ from other countries. Theng and Boon (1996) stated that owners have a tendency to blame the economic environment and that they have higher taxes compared to other countries in the same area. Also, the sample is done in the manufacturing sector, approximately 82% of the respondents, so this might explain why the need for education was not highly considered in comparison to section 2.2.5. This because the manufacturing sector tends to have a lower level of education as the workers often learn necessary skills on the job.

2.2.2 Regional level

Christie and Sjoquist (2012) continue to verify the suggested hypothesis that the region has an impact on a firm's survival with their study on SME's determinants of survival in Georgia. Even though the study is made in a different country, Georgia has some similarities with the Swedish municipality system, yet they have counties instead. The results point to that size is very important as it also is the most consistent factor. The current size with respect to start-up size seems more dominant, thus confirming that early growth has a positive impact. Macroeconomic factors have proven to have an influence on the firm's survival as well.

Furthermore, Nyström (2006) concludes that the difference in regional variation in terms of entry and exit can be traced back to the industry structure. It is very clear in the northern parts of Sweden, where there is a high level of exit, but the low entry of firms. Also, the firm size is affecting the pattern of entry and exit. This speaks for the hypothesis that the spatial determinants affect the firm within the region, even though Nyström (2006) states that the

industry is more prominent than the municipally.

One observation is that urban regions characterized by high levels of *immigration*, as well as high percentage of employment in small firms, maintained high levels of new firm formation (Acs and Storey, 2004). This will, on the other hand, not suggest that the companies will have a high survival rate. Argumentation could be made that the environment, with its entrepreneurial "spirit", increases the chances of survival. Henceforth, new companies are often created where there is an opportunity regional wise (Backman et al., 2014).

Depending on which business sector the firm belongs to, the *population* has a fluctuating level of impact. Some firms need the population as they make up the customer base; selling goods or services to them. A change in inhabitants can have a significant effect on the firm's survival. This might start a snowball effect (Nyström, 2006) as firms settling in high populated areas will expand and attract even more firms, thus, it becomes more attractive for all the additional firms. The growth rate of the region is important for the company's health.

Income in the region might have an effect on the survival of a company as the buying power in the region will increase as the level of income increases. Yet, the personal income could more be considered important in the respect that it enables the owner to self-finance, rather than taking external finance (Repullo and Suarez, 2000). Although external finance is sometimes important for expansion and can give the firm a running start, they need to be able to pay it back. If the venture is too risky, self-financing opposed to external financing is not preferable.

Competition, as well as unfair competition from the public sector, from large corporations and from imports are reasons for business failure (Theng and Boon, 1996) according to economists. Also, the intensity of the competition can have a negative impact (Pe'er and Vertinsky, 2008). But there is also an aspect of the intensity of the competition that correlates to the size of the company. Smaller companies benefit from higher intensity of competition and those who survive to grow strong and very viable. Larger companies become less competitive in connection with their increase in survival rate (Barnett, 1997).

However, there is another view from sociologists that a growing number of firms clustering together signal security and good possibilities for the beneficial firm environment. Risks are reduced and ties between the firms are enhanced. Also, the clustering effect that appears when a number of firms allocate at the same area can create spill-over effects that are positive (Nyström, 2006). The companies can help each other or get better deals as they are a higher number of firms in the same area. They can also enhance their weight on the regional decision makers as their voices will be stronger as a group. On the other hand, at a certain point, there might be a shortage of resources and the chance of the firm's survival might become negative as the competition is enhanced (Parker, 2009b).

Nonetheless, this might have a negative effect in the long run, as it might increase the competition between companies. Of course, the situation can be turned around, as companies relocate due to lack of customers. In some cases, the need for meeting customers "face to face" is not as important as other factors. A business that does not depend on foot traffic might benefit from locating in remote areas where the rent is lower or there is more space. Yet, these companies might instead rely on other factors, such as good infrastructure and transportation solutions.

2.2.3 Industry level

Different industries benefit from various determinants as their need to function as a business vary. As some factors will be affecting all industries, these might be considered more important to evaluate. Nevertheless, the industry-specific differences could still be of value for the empirical analysis. Therefore, both types will be reviewed to give a wider perspective.

There is also a difference in which factors are important, depending on which sector of the industry the company belongs to. Restaurants, retail, and transportation are not as likely to survive in the service sector as do the education and health services (Knaup, 2005). For retail, the industrial factors have about double the impact of economic factors and these factors only explain 26% of the variation in business net income in comparison to the average which is 43% (Everett and Watson, 1998). Furthermore, companies that have a higher probability of going bankrupt are young and belong to the food, beverage and accommodation sector (Brüderl et al., 1992).

On the other hand, innovative companies having a higher chance of surviving, on an average 11%, are especially young firms in the science-based and specialized-supplier sector (Cefis and Marsili, 2006). Manufacturing sectors do not have that high of a survival rate in comparison to companies in new service sectors. If companies form alliances with each other, the failure rates are lower. The same is regarded for firms with tight product focus.

Unemployment, education and firm size have an effect on a firm's entry into the market (Nyström, 2006; Parker, 2009a). Although unemployment has an effect on a firm's entry, it has no effect on a company's ability to survive or fail (Everett and Watson, 1998). Carrasco (1999) states that starting a business from unemployment, rather than having a paid employment, increases the failure rate by a factor of three. This most likely comes from the fact that a person who is employed is receiving a steady income to rely on, as the firm's economy can be volatile at the start (Carrasco, 1999). It also follows that the unemployed person has had their self-assurance curtailed (Parker, 2009b) and they may dispute their every move and in some cases play it too safe.

2.2.4 Company level

Not all companies are closed for the lack of profitability or success. In some cases, the entrepreneurs close their companies in order to start new, even more, favorable opportunities. In other cases they attain other employment opportunities they cannot turn down and this reason tends to be higher the younger the company is (Taylor, 1999). As previously mentioned, a closure of a business does not an equal failure and in this thesis, we will regard a closed firm as closed, regardless the reason. If a company still has loans to creditors when they close, the closure will have an impact on their ability to repay the amount and the risk of the company defaulting on the loan will increase. Furthermore, the reasons for potential new opportunities, employment or ventures are interesting for this study as they might imply a shift in the region.

The *age* of the firm is an important determinant as young firms have a variability in their costs as they are learning about the industry and management (Everett and Watson, 1998). Age is the most important factor according to Parker (2009b) together with size. Additionally, young

firms are more vulnerable, especially if they are small, and if key persons are absent for various reasons; being absent on the count of sickness as there are no extra staff to cover the absence. Young firms also accouter the dilemma of *legitimacy* (Freeman et al., 1983), the younger the company the fewer people have heard about them and the trust level from other companies and customers is on a low level. With age, their reputation will spread and they will gain the ambient trust.

But as Klepper and Simons (2000) states, it is not only the age of the company that is important but rather the level *innovation* and *ability to change and be dynamic* that is important. Also, the level of innovation can be positive and improve the degree of scale (Jovanovic and Macdonald, 1994). If the companies do not learn to grow and change with their customers, they will not survive.

Firm size is, as previously mentioned, also important for the survival of the firm. Christie and Sjoquist (2012) support this fact that larger and older firms have a higher probability to survive one year longer than firms of a smaller size. Furthermore, Christie and Sjoquist (2012) continue to argue that an owner with multi-establishments has a higher risk for failure. This challenges Parker (2009b) as he says that having more than one establishment can have a positive effect on success. This dispute in opinion can suggestively constitute from Christie and Sjoquist (2012) using findings done on only manufacturing firms. The failures can correlate with industry or managerial specific problems.

Additionally, owners with more knowledge about the industry tend to start larger ventures (Colombo et al., 2004) as they may have more contacts and confidence. When measuring the size of the firm, it can be done in different ways, yet is mostly measured in respect to capital. Moreover, if the firm is new and within an industry that is defined as dependent on scale economies, the chance of survival decreases (Audretsch and Mahmood, 1995) but it does not deter entrepreneurs from entering these segments of the market.

Capital, or so more the lack thereof, is another reason for business failure (Everett and Watson, 1998). Having capital enhances chances to grow and has a positive impact on the firm's survival. As a firm age, the bank increases their knowledge about the company and their business. This will, most likely, result in lower interest rates and cheaper capital for the business owner, which will increase their ability to expand the firm (Brito and Mello, 1995). Income, both in a personal and a regional view, is regarded important for entry (Nyström, 2006).

Size of the team is also important and may bring a diversity to the team according to Parker (2009b) based on the conclusions made by Shane (2003). With a team of different backgrounds and education, the venture will maintain a broader spectrum of knowledge and input. The combined talent can not only provide advisement in different questions, but also a wide circle of contacts that benefits a firm in the long run.

2.2.5 Individual level

Parker (2009b) concludes that *age, education and time in the industry* are the most important individual factors for business success. Also, unemployment does not have an impact on survival of a firm in comparison to determinants of entrepreneurship (Carrasco, 1999) and can even have

a negative impact.

Education of the owner of the firm has a direct correlation to the survival of the firm (Everett and Watson, 1998) and if the business owner does not have industry experience or a high school degree, the closure will most likely not be successful (Bates, 2005). A person that possesses a higher education level will more likely detect and exploit entrepreneurial possibilities according to Nyström (2006). Thus, a higher education may also increase the chance of exit if the right opportunity comes along. Education, together with age and experience, are considered important for a firm's survival (Parker, 2009b).

Age of the owner of the firm is important (Parker, 2009b), but it is more likely that the age reflects the experience and education the person has accumulated. An older person has more life experience and has most likely tried and failed a few times before. As the population in some parts of the world are growing older, the impact of an aging population is starting to interest researchers. Tanikawa et al. (2017) state that a higher average age in top management has a negative impact on the firm's success. On the contrary, Backman and Karlsson (2013b) state that elderly individuals and becoming self-employed have a positive correlation. The results might differ not only as different datasets have been used, but also as the studies are made in two very different countries, South Korea versus Sweden.

Experience in business is important (Parker, 2009b; Bates, 2005), the experience of the certain field of business also increases the change of survival. Tanikawa et al. (2017) states that experience as in a specific management team and can be referred to as age. Thus, "age" reflects the experience the person has accumulated during their career. Experience is closely correlated with age in most cases. Even if a person changes field or industry, they will not be totally novice, as some aspects of knowledge can be transferred.

The probability of becoming self-employed is higher for those born outside of Sweden (Backman and Karlsson, 2013a). Parallels could be drawn as immigrants have difficulties finding employment due to lack of language or education certificates. Moreover, ethnic minorities are more likely to have unsuccessful closures, but an interesting finding points out that women have a higher chance of a successful exit than unsuccessful according to Parker (2009b).

2.3 Concluding the previous literature

Previous research points to many different determinants that are important for a firm's survival as reviewed in previous sections. While the various literature does not always agree, they acknowledge some of the same determinants. To get a better overview of the different determinants table 2.1 on next page, will show a summary of the different elements.

As most of the literature state that the spatial determinants are significant or should be investigated further, the hypothesis that regional determinants have an impact on a firm's survival is supported. Instead of using the 290 municipalities as Michaela Backman and Kristina Nyström have done in their studies (Backman and Karlsson, 2013a,b; Nyström, 2006), the various types of municipalities will be used. As the different types of municipalities are defined by spatial and population patterns, this would emphasize the patterns of regional determinants.

Table 2.1: Determinants for a firm's survival and their impact

Determinant	Significance for survival		
	High	Indifferent	Negative
<i>Macro level</i>			
Interest rates	x		
Recession and inflation	x		
Government regulations	x		
<i>Regional level</i>			
Immigration		x	
Population		x	
Unemployment			x
Education/Experience		Unknown	
Age structure		Unknown	
<i>Industry level</i>			
Innovation		x	
Competition			x
<i>Company level</i>			
Education/Experience	x		
Age	x		
Firm size	x		
Capital	x		
Income		x	
Team size		x	
<i>Individual level</i>			
Education	x		
Age	x		
Experience	x		

3. Method and Data

In this chapter, the method and data will be described. It will not only contain the method used to collect and process data but also why this is relevant for the thesis. The different variables within the data will also be explained to increase the transparency of the thesis.

3.1 Data construction

For this thesis, a quantitative approach has been chosen. This because, there is a lot of data to analyze and the goal is to find characteristics and patterns in the dataset. The relationship between the dependent and independent variables are interesting. Therefore, a logistic statistical method is used to determine if the hypothesis is supported by the empirical evidence from the data.

In chapter 2, the previous theory and literature were discussed to explain and find the variables that could be of importance in this study. The data is delimited by Sweden and the customer base of the company Froda. Froda provides business loans in the range of 10 000 SEK to 1 000 000 SEK. The customers are for the most part small and micro businesses in the range of the definition SME (see table 3.1).

Table 3.1: Definition of categories in SME

Company category	Staff headcount	Turnover	or	Balance sheet total
Medium-sized	< 250	\leq € 50M		\leq € 43M
Small	< 50	\leq € 10M		\leq € 10M
Micro	< 10	\leq € 2M		\leq € 2M

The data that will be used is from customers, here called companies, that have applied and been granted a loan and where the loan has been paid out. During the application process, the company has been looked at. Companies with a debt account have not been given a loan, and companies with recent remarks on payment are given loans very restrictively. Furthermore, Froda looks at revenue transactions to furthermore make a more accurate evaluation of the company. This to make sure that the company is viable and still in business, as company data such as the annual reports are at least 6-18 months old.

By doing this, the companies can demonstrate that they are a sustainable business without sending extensive business plans and calculations. Thus, this results in a selection bias in terms of which companies will receive the loan and therefore included in the dataset. A company is

granted a loan amount corresponding to approximately one month's turnover if everything else is in order. Thus, to make sure the company can pay back the loan in time, as the loan term is relatively short, 4 – 18 months.

Table 3.2: Municipality categorization, taken and reformatted source: (Sveriges Kommuner och Landsting, 2016)

Main category	Municipality category	Short definition of municipality	Quantity
A. Large cities and municipalities near large cities	A.1 Large cities	– a population of at least 200 000 citizens with at least 200 000 citizens in the largest urban area.	3
	A2. Commuting municipalities near large cities	– more than 40 % of the working population commute to work in a large city or municipality near a large city.	43
B. Medium-sized towns and municipalities near medium-sized towns	B3. Medium-sized towns	– with a population of at least 50 000 citizens with at least 40 000 citizens in the largest urban area.	21
	B4. Commuting municipalities near medium-sized towns	– more than 40 % of the working population commute to work in a medium-sized town.	52
	B5. Commuting municipalities with a low commuting rate near medium-sized towns	– less than 40% of the working population commute to work in a medium-sized town	35
C. Smaller towns/urban areas and rural municipalities	C6. Small towns	a population of at least 15 000 citizens in the largest urban area.	29
	C.7 Commuting municipalities near small towns	– more than 30% of the working population commute to work in a small town/urban area or more than 30% of the employed day population lives in another municipality.	52
	C8. Rural municipalities	a population of less than 15 000 citizens in the largest urban area, very low commuting rate (less than 30%)	40
	C9. Rural municipalities with a visitor industry	– in rural area that fulfill at least two criteria for visitor industry, i.e. number of overnight stays, retail-, restaurant- or hotel turnover per head of population.	25

The specific loan data will be impossible for someone else to replicate, as the customer data is clandestine, but this is also what makes this thesis and its contribution important. As specific loan data is difficult to obtain, the contribution of knowledge in what type of municipality a specific company is situated will create value. Thus, making a more detailed analysis of what regional variables are contributing to a company's ability not to default on a loan or not. Table 3.2 shows the definition of the different categories of municipalities that will be used. They were recently revised by Sveriges Kommuner och Landsting (2016) and were implemented in 2017.

There is also data on regional level that will be used in this thesis and this data is gathered from different government authority databases that collect and process data. These agencies are called Tillväxtanalys, Bolagsverket and Statistics Sweden. A more detailed description of these variables will be described in section 3.3.

3.2 Dependent variable

To define the dependent variable, we need to characterize the "default" measure.

As there are many different definitions of small business failure, Watson and Everett (1993) examine the various levels and boundaries to propose the most relevant suggestion. At a first assessment, the relevant definition for this thesis would be business failure defined by bankruptcy. In the case of bankruptcy, the capital will not be returned to the creditors which are an objective, unbiased and uncomplicated definition according to Watson and Everett (1993) as this statement is very straightforward regarding other definitions.

On the other hand, it is according to Theng and Boon (1996) a narrow definition and a superior definition is one defined as: "termination with losses to creditors and shareholders" as it is considered in the middle of the spectrum. Where the broadest view considers "termination due to any reason". However, in this thesis, a firm will be considered a failure if it defaults on their loan regardless of the definition of failure. Additionally, a reason for fewer exits in sole proprietorships could be the lack of alternative job opportunities in the observed area. This is the case in the north of Sweden where the employment possibilities are more limited than in the rest of the country (Backman et al., 2014).

As such, a company's profitability is not directly linked to their continuation and survival. Many entrepreneurs tow their companies along even though the business does not show promise and return. Suggestively, the basis of this can be that they do not have an alternative employment opportunity or that they find the reason for maintaining the firm overpowers the need for profit. This could explain why individual exit rates have a tendency of having been lower than cooperations (Ronstadt, 1986).

Default – " A failure to do something that you legally have to do, such as pay a debt; the fact of not paying interest or other money that is owed on time "

— Cambridge Dictionary (n.d.)

The dependent variable in this thesis is if the company is defaulting on their loan or not. To get a larger data size all non-performing loans will be merged into one set of binary variables. This data will include companies that have gone bankrupt, bankrupt but the guarantor is repaying according to a payment plan, are closed, have a long payment plan, and are more than 30 days late with their payments. Table 3.3 show how many of the dependent variables are located in each category of municipality. It also shows the total quantity of loan applications in each category.

Table 3.3: Dependent variables in the different categories municipalities

Municipality category	Default Quantity	Total Quantity
A.1 Large cities	3	427
A2. Commuting municipalities near large cities	5	222
B3. Medium-sized towns	20	375
B4. Commuting municipalities medium-sized towns	4	100
B5. Commuting municipalities near medium-sized towns	1	66
C6. Small towns	13	138
C7. Commuting municipalities near small towns	1	52
C8. Rural municipalities	2	88
C9. Rural municipalities with a visitor industry	3	35

3.3 Independent variables

Independent variables will be divided according to the same levels as in chapter 2 and section 2.2. The macro level variables will not be considered as they are the same for all types of municipalities. They will also be disregarded as the company-specific data does not have a large historical span, thus they will not show an impact on the result. Some of the variables will be converted into dummy variables that are set to 0 or 1. To avoid multicollinearity, one of the variables will be left out as a comparison variable.

Table 3.4: Description of Industry variables

Variable	Description	Reference
Type of Industry <i>Commerce, Restaurant, BeautySalon/Hairdresser, Cleaning, Carshop/Mechanics, Construction, Cab</i>	Dummy variable, <i>Other</i> is comparison variable	Bisnode & Froda

The *Industry* variables in table 3.4 are concluded from the 2 numbered Swedish Standard Industrial Classification (SNI) code. This code is used to specify what type of industry a company belongs to on different levels. As the specification of industry becomes more narrow, more numbers are added. As this code not always reflects the real type of business conducted, Froda has re-calibrated the types to better describe what the companies do. As there only is one industry level variable the expression for the industry variables is:

$$Industry = \beta_{1-7} Type\ of\ Industry; \quad (3.1)$$

The *Overall information* about the company shows an overall picture of the company that made the application and is displayed in table in table 3.5. The *Type of Company* is restricted to the four most common types of company types in Sweden moreover, these are the four types that Froda has in their customer base. The *PO Box* is a binary variable showing if the company has a PO Box or not. This to show if the company is really registered on a physical address or for some reason the owner has chosen not to register the actual address of the company. Furthermore, to get an overall picture of the health of the company *Pd Score* is used. Pd stands for the probability of default, is an overall evaluation of the company done by Bisnode and

displayed in percent in a range from 0 to 100. They have done a logistic regression that is built on all the companies in Sweden. They take into account the company's ability to pay, economic situation, demography and macroeconomic information such as the risk of the industry. The score measures the risk of bankruptcy, seizure, and debt (Bisnode, 2018). *Company Board Events* shows how many events in total the company has, that have included the board or company such as board member changes or changes in the company structure. This to show if the company has done a lot of changes in its structure that might influence other variables.

Table 3.5: Description of Company variables

Variable	Description	Reference
<i>Overall information</i>		
Type of Company <i>Sole Proprietorship, Partnership, Limited Partnership</i>	Dummy variable, <i>Corporation</i> is comparison variable limited partnership company	Bisnode
PO Box <i>yes, no</i>	Binary variable	Bisnode
Pd Score	Credit Score conducted by Bisnode	Bisnode
Company or Board Events	How many events that have involved either the company or the board	Bisnode
<i>Age of firm</i>		
Age Application Date	Company's age when applying for the loan	Bisnode & Froda
<i>Size of team</i>		
Have Employees <i>yes, 5 or more, 10 or more</i>	Dummy variable, <i>No employees</i> is comparison variable	Bisnode
<i>Stability/ Capital</i>		
Chattel Mortgage <i>Tot, 6m-th</i>	How many chattel mortgages the customer has during defined period	Bisnode
No Of Petitions Last 2 Months	Petitions the company received last 2 months	Bisnode
No Of Remarks Of Payment Total E	Remarks to the private sector	Bisnode
No Of Remarks Of Payment Total A	Remarks to municipality and state	Binsode

To get a picture of the *age* of the firm *Age Application Date* used. This variable shows the age of the company at the time of application of the loan. Bisnode provides the registration date of the company and Froda has then calculated current age with every application.

Size of the team is measured by the amount of employees the company has. *Have Employees* shows if a company first has employees or not and then if they have over five and then ten employees. This is compared to companies that have no employees at all.

The *capital* of the firm is not measured as it is not available for all companies, instead other factors are included that affect the capital and the stability of the firm. *Chattel Mortgage* shows how many chattel mortgages the company has had in total and during the last six months. This is often external finances that the company has and the three following variables show if the company has any petitions or remarks on payments that can indicate if the company has financial difficulties. *No Of Petitions Last 2 Months* shows the number of petitions that the company has received in the last two months. Even if these are paid, they will still remain. *No Of Remarks Of Payment Total E* shows the total number of remarks of payment regarding the private sector, such as other companies, the company has received. Even if these are paid they

will remain and they are often barred after three years. *No Of Remarks Of Payment Total A* shows the total number of remarks of payment regarding the public sector, such as tax, student loans, the company has received. Even if these are paid they will remain and they are often barred after three years. The expression for the company variables is:

$$\begin{aligned}
Company = & \delta_{1-3}Type\ of\ Company_i + \delta_4Box\ Address + \delta_5Pd\ Percent + \delta_6Age\ Application \\
& + \delta_{7-10}Date\ Have\ Employees + \delta_{11}Company\ Board\ Events_i + \delta_{12-13}ChattelMortgage_i \\
& + \delta_{14}No\ Of\ Petitions\ Last\ 2\ Months + \delta_{15}No\ Of\ Remarks\ Of\ Payment\ Total\ E \\
& + \delta_{16}No\ Of\ Remarks\ Of\ Payment\ Total\ A
\end{aligned} \tag{3.2}$$

Table 3.6: Description of Individual variables

Variable	Description	Reference
Age Principal	Age of Owner	Bisnode
Age Principal ²	Age of Owner ²	Bisnode
Total Number Of Remarks On Payment Principal	Total number of remarks the owner has	Bisnode

Age of the individual is displayed in two ways and is shown in table 3.4. The first one, *Age Principal* shows the age of the owner of the company, or if it is a cooperation it shows the age of the person acting as the company director. The second one, *Age Principal²* is the previous squared as an attempt to get the effects of age more accurate.

Total Number Of Remarks On Payment Principal shows the remarks on payments that the whole board has received. There is also here a barred period of about three years. This variable could show if the owner of the company has private financial problems and could in some cases affect the company's finances as well. The expression for the Individual variables is:

$$\begin{aligned}
Individual = & \zeta_1Age\ Principal + \zeta_2Age\ Principal^2 \\
& + \zeta_3Total\ Number\ Of\ Remarks\ On\ Payment\ Principal
\end{aligned} \tag{3.3}$$

Table 3.7 shows the different regional variables included in the dataset. *Category of Municipality* shows what category of a municipality the company belongs to. They are further described in table 3.2. This is the variable that is interesting to see if it has an affect on a company's ability not to default on a loan or not. As *taxes* is important on a Macro level the *Municipality tax 2016* is used to see if it has an impact on a regional level. It shows the municipality tax in percent during 2016. *Entry/Exit* is used to see if these variables can show any patterns in where new companies form or fail due to the regional factors. *Newly/Total Reg Comp* shows the newly registered companies during 2017 divided by the total number of registered companies during 2017. *Bankruptcy reg 2017-2012* shows the bankruptcies during 2017, where the companies were registered during 2017-2012 divided by total bankruptcies 2017. *Bankruptcy reg 2012* shows the bankruptcies during 2017, where the companies were registered before 2012 divided by total bankruptcies 2017.

The change in *population* can have an affect on a company's survival. Therefore the *Average age 2017* is used to shows the average age of the population during 2017 in each category of

municipality. Other variables that show the fluctuation in the population is *Unemployment 2017*, which shows the unemployment in the different municipalities during 2017 in percent. *Average Income* shows the average income in the different municipalities during 2017 in the age 20-64 years. If the unemployment is high and the average income is low this might affect the firm's survival as the buying power is lower. Lastly, *Highly Educated* shows the percent of the population in the age 25-64 years, that have a higher education of at least three years after high school.

Table 3.7: Description of Regional variables

Variable	Description	Reference
Category of Municipality $A_1, A_2, B_4, B_5, C_6, C_7, C_8, C_9$	Dummy variable, B_3 is comparison variable	see table 3.2
Municipality tax 2016 <i>Entry/Exit</i>	Municipality tax 2016 in percent	SCB (2018g)
Newly/Total Reg Comp	Part of Newly/Total registered companies 2017	Bolagsverket (2018b,a)
Bankruptcy reg 2017-2012	Part of Bankruptcies during 2017 that were registered 2017-2012	Tillväxtanalys (2018b)
Bankruptcy reg before 2012	Part of Bankruptcies during 2017 that were registered before 2012	Tillväxtanalys (2018a,b)
<i>Competition</i>		
GDP	per worker compared to the whole country 2015	SCB (2017)
<i>Population</i>		
Average age 2017	The Average Age 2017	SCB (2018c)
Citizens per km^2	Citizens per km^2 2017	SCB (2018d)
Unemployment 2017	unemployment 2017 in percent	SCB (2018b)
Average income	Average income 2016 age 20-64	SCB (2018h)
Highly Educated	Percent highly educated	SCB (2018a)
Share Immigration other	Part of immigration from countries except Scandinavia 2017	SCB (2018f)
<i>Immigration/Emigration</i>		
Immigration 2017/2007	change in immigration 2017/2007	SCB (2018e)
Emigration 2017/2007	change in emigration 2017/2007	SCB (2018e)

Competition could be indicated by *GDP*, as it shows the regional GDP divided by the total GDP for the whole country. Also the *Citizens per km^2* which show the citizens per km^2 2017, could indicate if the companies compete for a large amount of citizens or not.

Immigration/Emigration show how the population is moving in the different municipalities and this might affect the companies depending on location. *Share Immigration other* shows the part of immigration of citizens that has heritage from countries outside of Scandinavia. *Immigration 2017/2007* shows the total immigration to the different municipalities 2017 divided by the total immigration in 2007. *Emigration 2017/2007* shows the total emigration to the different municipalities in 2017 divided by the total emigration of 2007. The expression for the Regional variables is:

$$\begin{aligned}
\text{Regional} = & \vartheta_{1-8} \text{Category of Municipality}_i + \vartheta_9 \text{Newly/Total Reg Comp} \\
& + \vartheta_{10} \text{Bankruptcy reg 2017 - 2012} + \vartheta_{11} \text{Bankruptcy reg before 2012} \\
& + \vartheta_{12} \text{Average age 2017} + \vartheta_{13} \text{Municipality tax 2016} + \vartheta_{14} \text{GDP} \\
& + \vartheta_{15} \text{Citizens per km}^2 + \vartheta_{16} \text{Share Immigration other} + \vartheta_{17} \text{Immigration 2017/2007} \\
& + \vartheta_{18} \text{Emigration 2017/2007} + \vartheta_{18} \text{Emigration 2017/2007} + \vartheta_{19} \text{Unemployment 2017} \\
& + \vartheta_{20} \text{Average income} + \vartheta_{21} \text{Highly Educated}
\end{aligned} \tag{3.4}$$

The total equation for the whole model is:

$$Y = \alpha + \beta_i \text{Industry}_i + \delta_i \text{Company}_i + \zeta_i \text{Individual}_i + \vartheta_i \text{Regional}_i \tag{3.5}$$

To make sure that the variables do not correlate to much with each other a correlation matrix has been done and is found in Appendix A. The limit for the correlation have a higher limit for the regional determinants as these are the ones that are especially interesting for this thesis. The correlation method used is the Persons two tailed method to measure the strength of the different variables. Normally a correlation of $0.5 < |r|$ is considered a strong correlation and correlation greater than this is avoided. But as mentioned before, some of the variables in this thesis have a higher correlation.

3.4 Statistical method

The statistical method of choice is a regression model to study the relationship between the different categories of municipalities and the defaulting on loans. There are many different types of regression models, the simplest one is the linear regression.

But for this thesis the logistic regression model is used as it is the most common model in processing data with a binary outcome (Hosmer and Sturdivant, 2013). Also, two benefits of using the logistic regression model are that it is flexible and easy to use from a mathematical standpoint. The other reason is that the parameters of the model make up a foundation for a clinically meaningful assessment of fallout (Hosmer and Sturdivant, 2013). In a logistic regression model, the outcome variable (y in the explanation above) is binary. The outcome variable in this case will be if the company defaults or not defaults on their loan.

The formula used for logistic regression can be simplified as $\pi(x) = E(Y|x)$ (Hosmer and Sturdivant, 2013). This represents the conditional mean of Y given a certain x . The full formula is

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}} \tag{3.6}$$

The logit transformation is important and is an essential part of the logistic regression. It is a transformation of $\pi(x)$ and is defined as

$$g(x) = \ln \left[\frac{\pi(x)}{1 - \pi(x)} \right] = \beta_0 + \beta_1 x_i \quad (3.7)$$

$\pi(x)$ represents the probability of an event occurring and the β_i stands for the regression coefficient belonging to that specific group of independent variables x_i . Taking the exponential value of β_i gives us the odds ratio, the odds of the event occurring for every x_i . Furthermore, odds ratios are used to easier interpret the results. If the odds ratio exceeds one then the variable has a positive effect on the outcome, in this case, increases the probability of defaulting on a loan. On the other hand, if the odds ratio is below one has a negative relationship, hence, increases the probability of not defaulting on a loan. In the logistic-model robust standard errors are used to correct for heteroscedasticity. For further theory see (Ledolter, 2013) or other literature on the subject.

4. Empirical analysis

In this chapter, the empirical results will be presented. Initially, some descriptive data will be displayed to create an overall picture. Then the statistical results will be presented and discussed compared to the literature in chapter 2.

4.1 Descriptive Data

During 2017, there were a total of 951,121 registered companies in Sweden that were either corporations, sole proprietorships, partnership or limited partnership companies, of these, the larger quantity was corporations (Bolagsverket, 2018*b*). There were 67,936 newly registered companies during this period and 3,719 bankruptcies (Bolagsverket, 2018*a*; Tillväxtanalys, 2018*b*). Table 4.1 shows the distribution of registered, newly registered and bankruptcies throughout the different types of municipalities in Sweden. As the table shows, the larger types of municipalities had more companies that were registered, but they also had a larger quantity of newly registered companies and bankruptcies.

Table 4.1: Regional company data 2017 (Tillväxtanalys, 2018*b*; Bolagsverket, 2018*a,b*)

Type of Municipality	<i>Type of municipality</i>								
	A1	A2	B3	B4	B5	C6	C7	C8	C9
Newly Registered	21,745	13,131	14,415	4,181	2,664	6,420	2,373	2,003	1,004
Bankruptcy	2,056	417	849	54	28	237	49	15	14
Registered	281,582	179,867	193,851	62,581	44,528	96,436	43,311	37,671	1,294

As the different types of Municipalities are different sizes, the relationship between the total registered companies, the newly registered and the bankruptcies gives a more descriptive view. Furthermore, to get a sense of how the development has been the last years, this data is presented between 2012-2017. Figure 4.1 on the next page shows the newly registered companies with respect to all registered companies. As the graph shows, there was an increase in registration in most of the municipalities after 2014. This can be the effects of the financial crisis in 2008. As the banks' economies are stabilizing (The Economist, 2017) it can also increase the registration of new companies. As the banks are recovering, so are also companies, as their sales stabilize and they can pay back debts as profits increase again and they are keener to obtain more credit (The Economist, 2018). This also means that entrepreneurs that had an idea for a business might have kept the idea on ice, and are now willing to launch it as the market stabilizes.

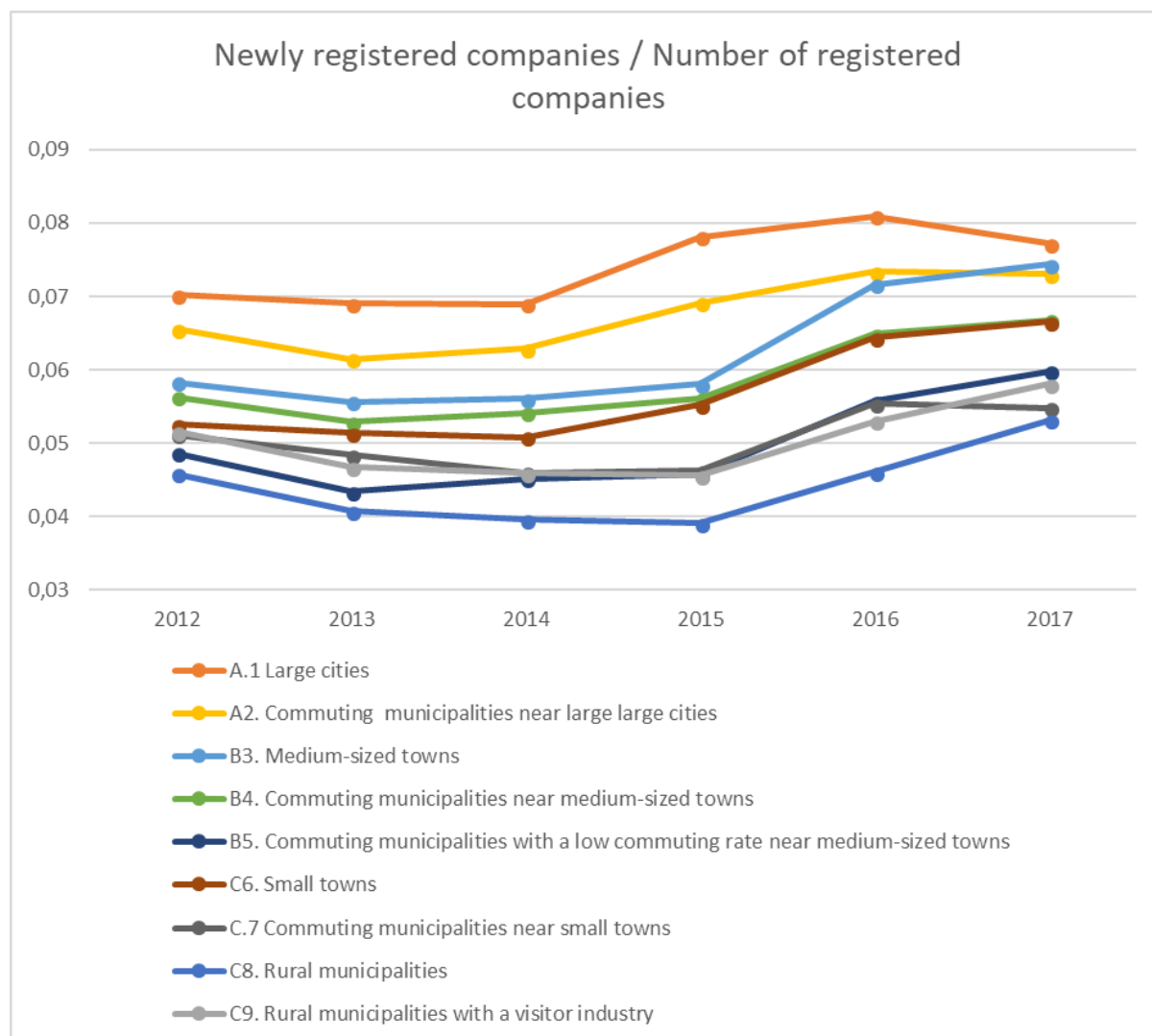


Figure 4.1: Registered companies during the year divided by total number of registered companies that year, Municipality type A1-C9 (Bolagsverket, 2018*a,b*)

Instead figure 4.2 shows the companies that filed for bankruptcy divided by the total registered companies that same year. The graph indicates that the rates of bankruptcy have decreased, which is in line with the reasoning above. To get a more detailed view of the types of municipalities where the fraction is smaller, figure 4.3 excludes municipality category A1 and B3. The graph now becomes more interesting and there is fluctuations year, to year but the most significant difference is between the different types of municipalities. Even though there is not a large difference with the fraction in mind, the tendencies are greater depending on which category of municipality.

Comparing type C7. Commuting municipalities near small towns and B4. Commuting municipalities near medium-sized towns, for example, the graph shows as one has decreased the other has increased. This indicates that there is a difference depending on which type of municipality the company is situated in. Furthermore, the type of municipality that does not have a trend a fluctuates up and down almost every year is C9. Rural municipalities with a visitor industry might do so as the quantity of these municipalities is not that large, numbering to only 25. Also, they do not have a large number of registered companies, only 1,294 during 2017 and had 14 bankruptcies compared to C8. Rural municipalities, that had 37,671 registered companies with 15 bankruptcies in 2017.

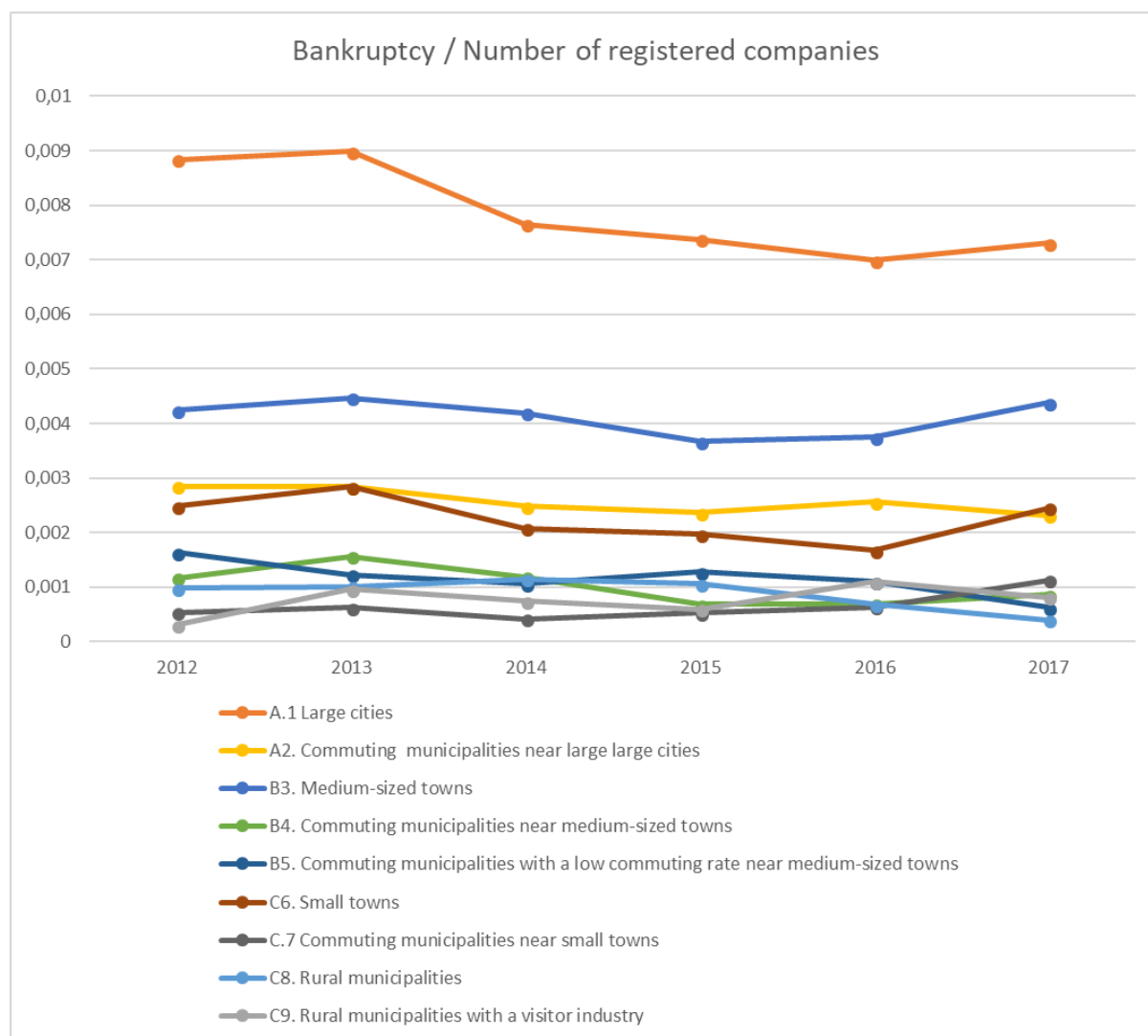


Figure 4.2: Bankruptcy divided by total number of registered companies that year, Municipality type A1-C9 (Tillväxtanalys, 2018*b*; Bolagsverket, 2018*a,b*)

The fluctuation from year to year could be explained by the impact one bankrupt company has on the total registered number of companies in comparison to the other types. Another explanation could be as the visitor industry is sensitive to customer behavior and the survival factors could be bad weather or other factors that might affect customers behavior and therefore have a significant impact on the companies survival.

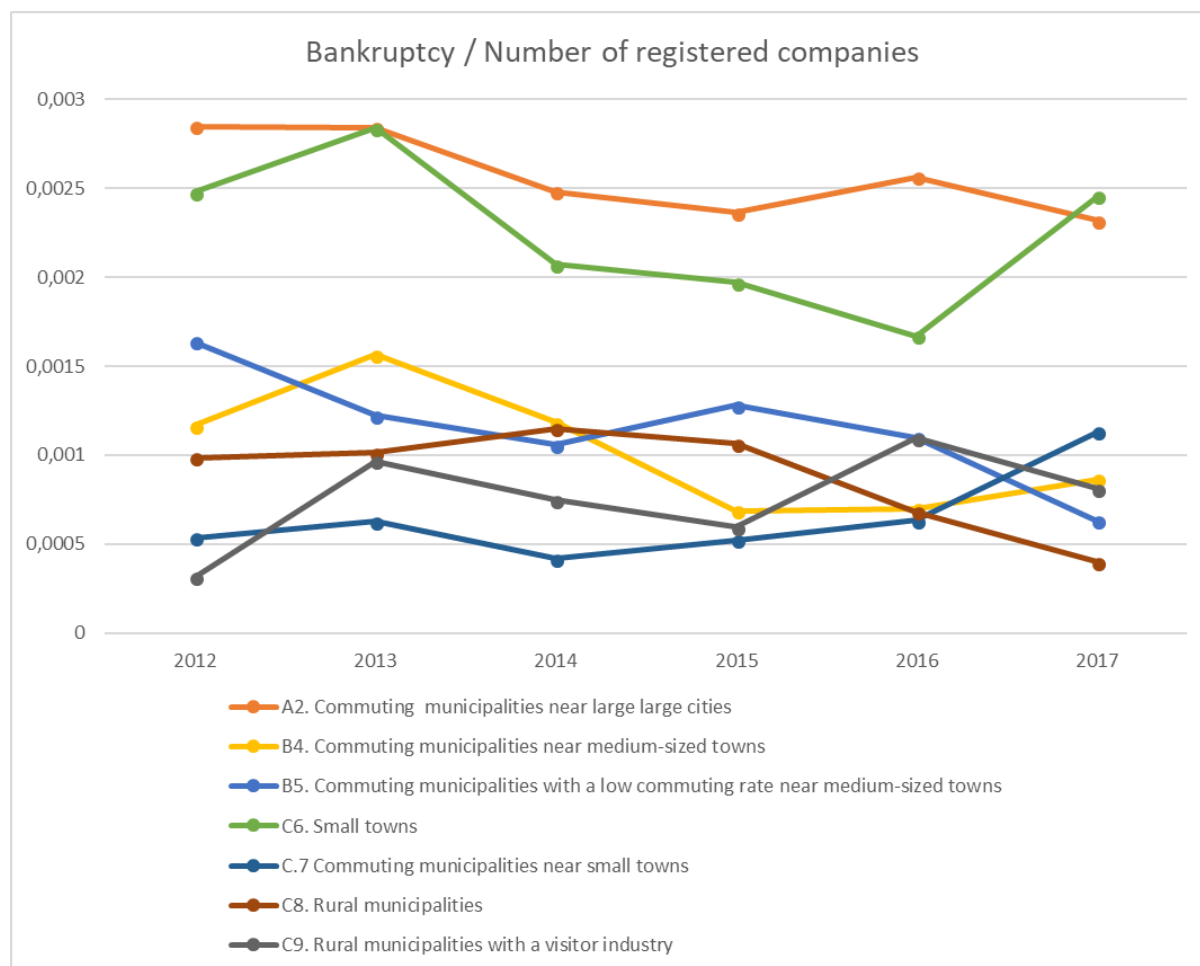


Figure 4.3: Bankruptcy divided by total number of registered companies that year, Municipality type A2, B4-C9 (Tillväxtanalys, 2018*b*; Bolagsverket, 2018*a,b*)

Table 4.2 shows the descriptive data from the data.

Table 4.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Default	1,503	0.000	1.000	0.122	0.327
Sole Proprietorship	1,503	0.000	1.000	0.252	0.434
Limited Partnership	1,503	0.000	1.000	0.044	0.205
Partnership	1,503	0.000	1.000	0.096	0.294
PO Box	1,503	0.000	1.000	0.050	0.218
Pd Percent	1,495	0.001	1.000	0.050	0.088
Age Application Date	1,503	0.005	93.022	7.002	7.500
have Employees	1,503	0.000	1.000	0.788	0.409
5 or More Employees	1,503	0.000	1.000	0.222	0.415
10 or More Employees	1,503	0.000	1.000	0.077	0.267
Commerce	1,503	0.000	1.000	0.349	0.477
Restaurant	1,503	0.000	1.000	0.415	0.493
Beauty Salon/ Hair dresser	1,503	0.000	1.000	0.059	0.236
Car shop/ Mechanics	1,503	0.000	1.000	0.030	0.170
Construction	1,503	0.000	1.000	0.032	0.176
Cab	1,503	0.000	1.000	0.026	0.159
Cleaning	1,503	0.000	1.000	0.020	0.140
Company Or Board Events Total	1,503	0.000	35.000	7.172	5.572
Chattel Mortgage Total	1,503	0.000	14.000	1.004	1.554
Chattel Mortgage Last 6 months	1,503	0.000	4.000	0.066	0.327
Age Principal	1,503	19.258	79.781	43.262	10.732
Age Principal ²	1,503	370.853	6,364.980	1,986.709	983.598
total Number Of Remarks On Payment Principal	1,503	0.000	26.000	0.684	2.297
No Of Petitions Last 2 Months	1,503	0.000	11.000	0.234	0.874
No Of Remarks Of Payment Total E	1,503	0.000	20.000	0.146	0.991
No Of Remarks Of Payment Total A	1,503	0.000	24.000	0.897	2.520
A1. Large cities	1,503	0.000	1.000	0.284	0.451
A2. Commuting municipalities near large cities	1,503	0.000	1.000	0.148	0.355
B3. Medium-sized towns	1,503	0.000	1.000	0.250	0.433
B4. Commuting municipalities medium-sized towns	1,503	0.000	1.000	0.067	0.249
B5. Commuting municipalities near medium-sized towns	1,503	0.000	1.000	0.044	0.205
C6. Small towns	1,503	0.000	1.000	0.092	0.289
C7. Commuting municipalities near small towns	1,503	0.000	1.000	0.035	0.183
C8. Rural municipalities	1,503	0.000	1.000	0.059	0.235
C9. Rural municipalities with a visitor industry	1,503	0.000	1.000	0.023	0.151
Newly/Total Reg Comp	1,503	0.032	0.099	0.071	0.010
Bankruptcy reg 2017-2012	1,503	0.000	0.755	0.400	0.225
Bankruptcy reg before 2012	1,503	0.000	1.000	0.566	0.237
Average age 2017	1,503	37.334	49.424	40.980	2.459
Municipality tax 2016	1,503	29.190	34.840	31.996	1.379
GDP	1,503	0.488	2.069	1.058	0.246
Citizens per km 2017	1,503	0.300	5,689.100	1,211.192	1,880.045
Share Immigration other	1,503	0.534	0.986	0.840	0.057
Immigration 2017/2007	1,503	0.709	7.394	1.558	0.681
Emigration 2017/2007	1,503	0.839	1.782	1.220	0.142
Unemployment 2017	1,503	4.500	9.600	6.734	1.107
Valid N (listwise)	1,495				

4.2 The probability of defaulting on a loan

Table 4.3, 4.4, 4.5 and 4.6 show the results from the logistic-model regarding the probability if a company defaults on a loan or not. If the odds ratio is below zero the companies have a higher probability of defaulting on a loan and if the odds ratio is below zero the probability of defaulting is lower.

Table 4.3: REGIONAL LEVEL: The probability of defaulting on a loan

Default	Odds Ratio	Robust Std. Err.
A1. Large cities	.467	.242
A2. Commuting municipalities near large cities	.234	.109***
B4. Commuting municipalities medium-sized towns	.223	.116***
B5. Commuting municipalities near medium-sized towns	.163	.123**
C6. Small towns	.738	.272
C7. Commuting municipalities near small towns	.056	.055***
C8. Rural municipalities	.153	.110***
C9. Rural municipalities with a visitor industry	.327	.295
Newly/Total Reg Comp	.001	.011
Bankruptcy reg 2017-2012	1.064	1.019
Bankruptcy reg before 2012	1.331	1.002
Average age 2017	1.181	.150
Municipality tax 2016	.901	.107
GDP	2.454	1.018**
Citizens per km ² 2017	1.000	1.478*10 ⁻⁴
Share Immigration other	261.847	662.594**
Immigration 2017/2007	.618	.108***
Emigration 2017/2007	.417	.442
Unemployment 2017	1.022	.089
Average income	1.007	.004*
Highly Educated	.978	.026
<i>The whole model</i>		
Constant	.001	.012
Pseudo R2	.171	
Log pseudolikelihood	-456.011	
Wald chi ² (46)	168.69	
N	1,495	

*p<0.1, **p<0.05, and ***p<0.01

Starting with the regional level, category A1.Large cities, C6.Small towns and C9. Rural municipalities with a visitor industry does not have any significant impact compared to category B3. Medium-sized towns, that was used as a comparison variable in the model. Instead the categories A2. Commuting municipalities near large cities, B4. Commuting municipalities medium-sized towns, B5. Commuting municipalities near medium-sized towns , C7. Commuting municipalities near small towns and C8. Rural municipalities have less probability for a company's ability to default on a loan. What these have in common except C8. Rural municipalities is that they are commuting municipalities. This might have to do with the fact that people in these categories are moving around stimulating the demand as it is not only the people

living in the municipality that enters and exits the borders. Another reason for the commuting municipalities to decrease the probability of defaulting on a loan could be that if they reside in a commuting municipality they might have chosen this for a reason. Maybe for some resource or other beneficial reasons depending on what type of company it is. In the cities the competition is high and the rents as well.

Newly/Total Reg, Comp Bankruptcy reg 2017-2012 and *Bankruptcy reg before 2012* do not have any significant impact on a company's ability to default on a loan. Some literature states that the fate of other companies affects others, especially in clusters. Some state that it has a positive impact (Nyström, 2006; Parker, 2009b) and some say that it can have a negative impact due to competition (Theng and Boon, 1996; Pe'er and Vertinsky, 2008). There are even some that say that it can have no impact at all (Frenken et al., 2014).

The rate of *Highly Educated* and *Average Age* does not have a significant impact and could be because of just having an education does not mean that you are running a business. Previously the age of the owner did not show any significance so that the age in the region does not have any significance is not that surprising. The *Municipality tax 2016* does not have any significance either and could be because it is quite similar to countrywide. This also counts for the *Unemployment* in the regions. On the other hand, the *GDP* and *Average Income* are significant and have a higher probability on a company's ability to default, which means that if the occupation is higher and the average income so is also the default rate. This might point to that if a region has more capital in movement more are willing to start a company and therefore increasing the risk of failure.

Citizens per km 2017 and *Emigration 2017/2007* does not have any significance, but *Immigration 2017/2007* have a lower probability for a company to default on a loan, which could mean that the buying power in the region increases (Repullo and Suarez, 2000). On the contrary the *Share Immigration other* have a high positive impact on the probability of a company defaulting. This corresponds to the literature stating that minority groups have a higher risk of failure (Parker, 2009b). Also this could also be because the immigrants are forced ably moved to different spots and there might not be other job opportunities than to start an own company even if the chance of survival is slight (Backman and Karlsson, 2013a).

Table 4.4: INDUSTRY LEVEL: The probability of defaulting on a loan

Default	Odds Ratio	Robust Std. Err.
Commerce	.278	.090***
Restaurant	.292	.098***
Beauty Salon/ Hair dresser	.182	.094***
Carshop/Mechanics	.544	.289
Construction	.638	.320
Cab	.782	.395
Cleaning	.341	.246

*p<0.1, **p<0.05, and ***p<0.01

Continuing with the *Industry* variables the results show that no one has a positive impact and therefore lowers the probability of defaulting on a loan compared to unknown sector. However, restaurants and Beauty Salon/ Hair dresser s have a slightly lower probability of defaulting on a loan. This is in line with prior literature by (Knaup, 2005; Everett and Watson, 1998; Brüderl

et al., 1992) that states that restaurants and commerce have a higher risk of failure.

Table 4.5: COMPANY LEVEL: The probability of defaulting on a loan

Default	Odds Ratio	Robust Std. Err.
Sole Proprietorship	.838	.290
Limited Partnership	1.166	.518
Partnership	.662	.259
PO Box	3.613	1.502***
Pd Percent	41.679	37.941***
Age Application Date	.962	.023*
have Employees	.679	.159*
5 or More Employees	1.313	.335
10 or More Employees	.261	.158**
Company Or Board Events Total	.930	.026***
Chattel Mortgage Total	1.130	.088
Chattel Mortgage Last 6 months	.295	.170**
No Of Petitions Last 2 Months	1.499	.141***
No Of Remarks Of Payment Total E	1.014	.077
No Of Remarks Of Payment Total A	1.045	.033

*p<0.1, **p<0.05, and ***p<0.01

Moving on to the *Company* variables it shows that the type of company compared to corporations is not significant. PO Box increases the probability of default. There are some theories that a PO Box could increase the chance of fraud, and some institutes give out warnings to beware if a company or person uses a box address (Försäkringskassan, 2008). The *Pd Percent* have a high odds ratio which points to that the well-being of a company really has a relationship to if a company defaults on a loan or not. As this is a compiled measurement from a lot of different factors it is difficult to distinguish what has the most impact.

Age Application Date shows that the age of firm does have an impact on the company's ability not to default on a loan and corresponds to the literature that age is important for survival (Everett and Watson, 1998; Parker, 2009b). The outcome might be different if the spread in age is greater Frenken et al. (2014). To have employees and over 10 employees have a lower the probability with a company defaulting on a loan. Therefore, it is positive for a firm in respect not to default on a loan. The literature also states that having a larger team is positive for their survival (Parker, 2009b; Shane, 2003).

Regarding the stability in the company, *Company Or Board Events Total* shows that it lowers the probability on a company's probability to default. Furthermore, *No Of Remarks Of Payment Total E*, *No Of Remarks Of Payment Total A* have no statistically significant impact. This could be based on that is these events occur during an application the company is evaluated very carefully and if the application is approved these variables have been considered. Regarding *No Of Petitions Last 2 Months*, on the other hand, that shows positive probability for a company to default. This could mean this variable should be given more attention in the analysis. This also corresponds to the literature that says that capital is important for a firm's survival (Everett and Watson, 1998; Brito and Mello, 1995; Nyström, 2006). If a company has recent petitions this could point to liquidity problems. Furthermore, this points to the positive impact recent chattel mortgages have on the ability not to default on a loan. *Chattel Mortgage Last 6 months*

points to that capital is important for a company's survival.

Table 4.6: INDIVIDUAL LEVEL: The probability of defaulting on a loan

Default	Odds Ratio	Robust Std. Err.
Age Principal	.937	.056
Age Principal ²	1.001	.001
total Number Of Remarks On Payment Principal	.990	.039

*p<0.1, **p<0.05, and ***p<0.01

Finally, *Age Principal* and *Age Principal*² does not any significance which points to different studies that it is not the age, nor an increased significance and thereafter declining (*Age*²). Some literature says that older people have a higher risk for failure (Tanikawa et al., 2017), others say that elderly and survival has a positive correlation (Backman and Karlsson, 2013b). On the other hand some say that it is more about the experience (Parker, 2009b) and this correlates somewhat with the *Age of Application* previous mentioned. *total Number Of Remarks On Payment Principal* does not have any significant impact either.

5. Conclusion and Future Studies

This chapter will conclude the findings of this thesis and present how the research question has been answered. This chapter will also state suggestions for future research on the subject.

5.1 Conclusion

The purpose of this thesis was to answer the question if the location of a company influence a company's ability not to default on a loan. To answer this question the determinants for survival of a company was first stated from the literature. Thereafter regional factors was included in the analysis together with company-specific loan data.

As previous researches have stated, regional factors are important (Porter, 2000; Kuah, 2002; Backman and Karlsson, 2013a) when evaluation a company the result from this thesis is very interesting. The overall conclusion is that the regional factors do have an impact on the companies ability not to default on a loan. The different categories where the companies are located could be regarded as clusters, as the geographic boundaries are set by the observer (Porter, 2000). This would follow the agglomeration theory by Marshall (1890), that companies in the same area benefit from spillovers and create advantages.

In correlation with the previous findings the age of the firm, employees and capital had a negative relationship to a company's probability of defaulting. Therefore, having a positive relationship with a company's ability not to default on a loan. Furthermore, petitions had a negative impact, also correlating with the literature that capital is important for survival. For the regional determinants the most significant factor was the share of immigrants from countries other than Scandinavia. This variable had a strong positive relationship for the probability of a company's ability to default. This clearly shows that the immigration has a negative odds ratio for a company's ability Not to default on a loan.

For the different categories of municipalities, this thesis shows that the categories in which the residents commute, regardless if it is an extensive amount or not, have a positive relationship to the probability of a company's ability Not to default on a loan. The region in such does not have a negative relationship to the probability of the company's ability Not to default, but instead positive.

For future studies, the subject could be studied with a wider spread and over a longer time. As the available data does not really represent all the companies in Sweden and it is relatively

new data, a sample over longer time might give other results. Also, if the data consists of a larger quantity of companies a scale of default could be made. This to distinguish if there are different factors affecting the company going through liquidation problems to going bankrupt. This thesis has clearly shown that the categories of municipalities does influence a company's ability Not to default on a loan. It would be interesting to know more about why and how. Are there other determinants that are more significant?

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Appendices

A. Correlation Matrix

Table A.1: Correlation Matrix

	Sole Proprietorship	Limited Partnership	Partnership	Box Adress	Pd Percent	Age Application Date
Sole Proprietorship	1					
Limited Partnership	-,124**	1				
Partnership	-,189**	-,070**	1			
Box Address	-,098**	-,019	-,043	1		
Pd Percent	,186**	0,010	-,065*	-,059*	1	
Age Application Date	-,024	,055*	0,024	,076**	-,105**	1
have Employees	-,322**	0,016	-,080**	0,029	-,015	0,035
5 or More Employees	-,262**	-,013	-,076**	0,040	-,006	,143**
10 or More Employees	-,168**	0,011	-,086**	0,048	-,007	,102**
Commerce	-,087**	-,068**	-,044	,108**	-,134**	,155**
Restaurant	-,007	,097**	,144**	-,137**	,185**	-,119**
Beauty Salon/ Hair dresser	,107**	-,040	-,063*	-,032	0,016	-,008
Car shop/ Mechanics	0,015	0,020	-,031	,067**	0,005	0,036
Construction	-,010	-,002	-,021	0,011	-,038	-,062*
Cab	,098**	0,006	-,053*	-,018	-,002	-,022
Cleaning	0,027	-,031	0,018	0,033	-,006	-,037
Company Or Board Events Total	-,670**	-,071**	-,154**	,147**	-,114**	,235**
Chattel Mortgage Total	-,221**	0,029	-,071**	,212**	-,037	,383**
Chattel Mortgage Last 6 months	-,094**	-,013	-,038	,262**	-,039	-,057*
Age Principal	-,062*	-,002	0,000	,071**	-,116**	,411**
Age Principal^2	-,058*	0,001	-,002	,077**	-,106**	,417**
Total Number Of Remarks On Payment Principal	0,002	,079**	,055*	-,046	,308**	0,017
No Of Petitions Last 2 Months	-,155**	-,035	-,051*	-,012	,206**	0,017
No Of Remarks Of Payment Total E	-,042	0,031	-,039	,059*	,163**	,181**
No Of Remarks Of Payment Total A	-,064*	-,017	-,041	-,019	,233**	,144**
A1	-,121**	0,038	-,060*	0,018	-,069**	0,034
A2	,065*	-,053*	,068**	-,044	0,029	0,025
B3	-,037	-,071**	-,015	0,044	0,028	-,092**
B4	0,042	-,005	0,040	-,037	-,047	-,036
B5	-,057*	,097**	-,004	-,019	-,009	,073**
C6	0,044	,056*	0,006	-,031	0,013	0,013
C7	,116**	-,023	0,013	,057*	0,021	,055*
C8	0,005	0,030	0,005	-,005	,058*	-,002
C9	,093**	-,033	-,035	0,005	0,006	-,028
Newly/Total Reg Comp	-,079**	-,033	-,009	0,022	-,054*	-,070**
Bankruptcy reg 2017-2012	-,075**	-,052*	-,075**	0,038	-,020	-,079**
Bankruptcy reg before 2012	-,015	,052*	0,040	-,017	0,031	,064*
Average age 2017	,096**	0,028	0,031	0,009	0,047	,060*
Municipality tax 2016	,114**	0,010	0,028	-,021	0,041	-,048
GDP	0,005	,079**	-,045	-,003	0,003	,062*
Citizens per km 2017	-,158**	0,027	-,068**	0,009	-,069**	0,044
Share Immigration other	0,045	0,035	-,013	0,050	,055*	-,099**
Immigration 2017/2007	,108**	-,004	-,009	-,038	,102**	0,028
Emigration 2017/2007	0,039	0,041	0,018	-,010	0,049	-,027
Unemployment 2017	,061*	0,012	,059*	0,018	0,032	-,008
Average income	-,163**	0,017	-,039	-,017	-,069**	,074**
Highly Educated	-,169**	0,021	-,078**	-,010	-,050	0,020

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

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

Table A.2: Correlation Matrix

	have Employees	5 or More Employees	10 or More Employees	Commerce	Restaurant	Beauty Salon/ Hair dresser
Sole Proprietorship	-,322**	-,262**	-,168**	-,087**	-0,007	,107**
Limited Partnership	0,016	-0,013	0,011	-,068**	,097**	-0,040
Partnership	-,080**	-,076**	-,086**	-0,044	,144**	-,063*
Box Address	0,029	0,040	0,048	,108**	-,137**	-0,032
Pd Percent	-0,015	-0,006	-0,007	-,134**	,185**	0,016
Age Application Date	0,035	,143**	,102**	,155**	-,119**	-0,008
have Employees	1	,276**	,150**	-,082**	,142**	-,098**
5 or More Employees	,276**	1	,542**	-,105**	,117**	-,093**
10 or More Employees	,150**	,542**	1	-,123**	,101**	-0,030
Commerce	-,082**	-,105**	-,123**	1	-,616**	-,184**
Restaurant	,142**	,117**	,101**	-,616**	1	-,211**
Beauty Salon/ Hair dresser	-,098**	-,093**	-0,030	-,184**	-,211**	1
Car shop/Mechanics	-0,033	0,019	-0,036	-,129**	-,148**	-0,044
Construction	0,048	0,012	0,018	-,133**	-,153**	-0,046
Cab	0,023	0,004	-0,047	-,119**	-,137**	-0,041
Cleaning	0,016	0,027	0,012	-,104**	-,120**	-0,036
Company Or Board Events Total	,283**	,305**	,238**	,134**	-,090**	-,067**
Chattel Mortgage Total	,148**	,225**	,272**	,138**	-0,007	-,130**
Chattel Mortgage Last 6 months	,055*	0,049	,094**	,062*	-0,004	-,051*
Age Principal	0,004	,113**	,053*	,169**	-,075**	-0,039
Age Principal^2	0,003	,108**	,054*	,172**	-,083**	-0,041
total Number Of Remarks On Payment Principal	0,010	0,042	0,019	-,076**	,078**	0,019
No Of Petitions Last 2 Months	,105**	,134**	,054*	-0,021	,077**	-0,015
No Of Remarks Of Payment Total E	0,027	,054*	0,015	-0,022	0,034	0,008
No Of Remarks Of Payment Total A	,109**	,120**	0,006	-,076**	,089**	,056*
A1	,055*	0,012	,089**	-0,006	-,090**	,067**
A2	-0,014	0,013	-0,022	0,010	-0,019	-0,009
B3	0,043	,074**	0,006	-,115**	,136**	0,044
B4	-,084**	-,059*	-0,037	,135**	-,100**	-0,044
B5	0,032	-0,013	-0,013	0,020	0,011	-,054*
C6	-0,027	-,059*	-0,023	-0,039	,088**	-0,041
C7	-0,018	-0,022	-0,041	,083**	-,063*	-0,032
C8	0,025	0,017	-0,019	0,008	0,003	-0,003
C9	-,125**	-0,051	-0,028	0,035	-0,022	-0,039
Newly/Total Reg Comp	,055*	0,048	,062*	-,113**	0,029	,056*
Bankruptcy reg 2017-2012	0,048	0,024	,058*	-,157**	,085**	,065*
Bankruptcy reg before 2012	-,070**	-0,016	-0,035	,105**	-0,048	-0,026
Average age 2017	-,067**	-0,043	-,068**	,113**	-0,002	-,089**
Municipality tax 2016	-,051*	-,059*	-,123**	0,017	,065*	-,055*
GDP	-0,007	-0,023	,084**	0,026	-0,004	0,025
Citizens per km 2017	,074**	0,044	,151**	-0,032	-,065*	,068**
Share Immigration other	0,029	-0,030	0,029	-,093**	,088**	0,024
Immigration 2017/2007	-,054*	0,021	-0,032	-0,024	,063*	-0,020
Emigration 2017/2007	0,004	0,007	0,046	-,102**	0,045	0,027
Unemployment 2017	-0,002	-,067**	-0,023	-0,044	0,027	-0,008
Average income	0,032	,076**	,129**	-0,008	-0,044	,051*
Highly Educated	,079**	,073**	,111**	-,082**	0,001	,077**

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

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

Table A.3: Correlation Matrix

	Car shop/ Mechanics	Construction	Cab	Cleaning	Company Or Board Events Total	Chattel Mortgage Total
Sole Proprietorship	0,015	-0,010	,098**	0,027	-,670**	-,221**
Limited Partnership	0,020	-0,002	0,006	-0,031	-,071**	0,029
Partnership	-0,031	-0,021	-,053*	0,018	-,154**	-,071**
Box Address	,067**	0,011	-0,018	0,033	,147**	,212**
Pd Percent	0,005	-0,038	-0,002	-0,006	-,114**	-0,037
Age Application Date	0,036	-,062*	-0,022	-0,037	,235**	,383**
have Employees	-0,033	0,048	0,023	0,016	,283**	,148**
5 or More Employees	0,019	0,012	0,004	0,027	,305**	,225**
10 or More Employees	-0,036	0,018	-0,047	0,012	,238**	,272**
Commerce	-,129**	-,133**	-,119**	-,104**	,134**	,138**
Restaurant	-,148**	-,153**	-,137**	-,120**	-,090**	-0,007
Beauty Salon/ Hair dresser	-0,044	-0,046	-0,041	-0,036	-,067**	-,130**
Car shop/Mechanics	1	-0,032	-0,029	-0,025	0,037	-0,003
Construction	-0,032	1	-0,030	-0,026	-0,033	-0,042
Cab	-0,029	-0,030	1	-0,023	-,090**	-,087**
Cleaning	-0,025	-0,026	-0,023	1	-0,021	-,052*
Company Or Board Events Total	0,037	-0,033	-,090**	-0,021	1	,351**
Chattel Mortgage Total	-0,003	-0,042	-,087**	-,052*	,351**	1
Chattel Mortgage Last 6 months	-0,035	-0,025	-0,033	0,000	,141**	,314**
Age Principal	-0,037	-0,041	-0,017	-0,017	,092**	,161**
Age Principal^2	-0,031	-0,037	-0,021	-0,013	,092**	,153**
total Number Of Remarks On Payment Principal	-0,035	-0,003	-0,007	0,005	-0,028	-0,038
No Of Petitions Last 2 Months	0,002	-0,036	-0,020	-0,016	,184**	,073**
No Of Remarks Of Payment Total E	0,010	-0,023	-0,016	-0,011	,088**	,054*
No Of Remarks Of Payment Total A	-0,028	-0,002	-0,028	0,028	,086**	,088**
A1	-0,024	,062*	,092**	-0,016	,087**	-0,007
A2	0,015	-0,012	0,026	0,008	-,081**	-,117**
B3	-0,029	-,052*	-0,026	0,028	,053*	,052*
B4	0,000	0,043	-0,044	-0,019	-,065*	-0,023
B5	-0,019	0,016	-0,035	0,016	,084**	,102**
C6	-0,015	-0,005	-0,008	-0,029	-0,035	-0,007
C7	0,009	-0,014	-0,031	-0,027	-,096**	0,042
C8	,073**	-0,029	-0,041	-0,015	-0,010	0,027
C9	0,051	-0,028	-0,025	,073**	-0,030	-0,032
Newly/Total Reg Comp	-0,038	0,024	,112**	0,022	,060*	-0,028
Bankruptcy reg 2017-2012	-0,033	0,012	,093**	-0,009	0,047	-0,017
Bankruptcy reg before 2012	-0,010	0,014	-,066*	0,028	0,012	,064*
Average age 2017	,051*	-0,036	-,113**	-0,042	-0,036	0,044
Municipality tax 2016	0,041	-,093**	-,053*	0,008	-,076**	0,006
GDP	0,002	0,018	-,052*	-,053*	-0,015	0,026
Citizens per km 2017	-0,024	,087**	,072**	-0,021	,109**	-0,002
Share Immigration other	-0,006	-0,038	-0,013	0,000	-0,018	0,036
Immigration 2017/2007	0,009	-,060*	-,073**	,068**	-,065*	-0,012
Emigration 2017/2007	0,038	0,020	0,049	0,023	-,051*	-,076**
Unemployment 2017	-0,005	-0,020	,051*	-0,019	-,066*	0,014
Average income	-0,043	,080**	0,010	-0,009	,132**	-0,004
Highly Educated	-,071**	0,049	,069**	0,005	,112**	-0,003

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

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

Table A.4: Correlation Matrix

	Chattel Mortgage Last 6 months	Age Principal	Age Principal^2	total Number Of Remarks On Payment Principal	No Of Petitions Last 2 Months	No Of Remarks Of Payment Total E
Sole Proprietorship	-,094**	-,062*	-,058*	0,002	-,155**	-,042
Limited Partnership	-,013	-,002	0,001	,079**	-,035	0,031
Partnership	-,038	0,000	-,002	,055*	-,051*	-,039
Box Address	,262**	,071**	,077**	-,046	-,012	,059*
Pd Percent	-,039	-,116**	-,106**	,308**	,206**	,163**
Age Application Date	-,057*	,411**	,417**	0,017	0,017	,181**
have Employees	,055*	0,004	0,003	0,010	,105**	0,027
5 or More Employees	0,049	,113**	,108**	0,042	,134**	,054*
10 or More Employees	,094**	,053*	,054*	0,019	,054*	0,015
Commerce	,062*	,169**	,172**	-,076**	-,021	-,022
Restaurant	-,004	-,075**	-,083**	,078**	,077**	0,034
Beauty Salon/ Hair dresser	-,051*	-,039	-,041	0,019	-,015	0,008
Car shop/ Mechanics	-,035	-,037	-,031	-,035	0,002	0,010
Construction	-,025	-,041	-,037	-,003	-,036	-,023
Cab	-,033	-,017	-,021	-,007	-,020	-,016
Cleaning	0,000	-,017	-,013	0,005	-,016	-,011
Company Or Board Events Total	,141**	,092**	,092**	-,028	,184**	,088**
Chattel Mortgage Total	,314**	,161**	,153**	-,038	,073**	,054*
Chattel Mortgage Last 6 months	1	-,059**	-,057**	0,011	,063*	-,017
Age Principal	-,059*	1	,989**	-,007	0,015	0,014
Age Principal^2	-,057*	,989**	1	-,004	0,005	0,012
total Number Of Remarks On Payment Principal	0,011	-,007	-,004	1	,082**	,256**
No Of Petitions Last 2 Months	,063*	0,015	0,005	,082**	1	,096**
No Of Remarks Of Payment Total E	-,017	0,014	0,012	,256**	,096**	1
No Of Remarks Of Payment Total A	-,031	0,049	0,036	,206**	,109**	,248**
A1	-,019	-,049	-,049	-,058*	0,034	-,042
A2	-,032	,091**	,092**	-,052*	-,010	-,031
B3	,086**	-,071**	-,078**	0,023	0,015	-,003
B4	-,037	0,025	0,027	-,043	-,007	-,026
B5	0,006	-,041	-,037	0,024	0,043	,103**
C6	-,001	0,007	-,001	,113**	-,030	0,048
C7	-,005	,062*	,065*	0,043	-,030	0,046
C8	-,016	,055*	,063*	0,012	-,031	-,028
C9	-,031	-,021	-,014	-,017	-,026	0,008
Newly/Total Reg Comp	-,006	-,047	-,056*	-,024	0,050	-,068**
Bankruptcy reg 2017-2012	0,022	-,087**	-,099**	0,006	0,030	-,036
Bankruptcy reg before 2012	0,007	,085**	,090**	-,012	-,004	0,023
Average age 2017	-,001	,089**	,099**	,084**	-,056*	,081**
Municipality tax 2016	-,037	-,051*	-,051*	0,050	-,061*	,069**
GDP	-,004	0,016	0,018	-,046	0,004	-,036
Citizens per km 2017	0,008	0,015	0,014	-,063*	,069**	-,040
Share Immigration other	0,028	-,120**	-,128**	,059*	0,006	0,022
Immigration 2017/2007	-,024	,061*	,064*	,181**	-,014	,152**
Emigration 2017/2007	-,009	0,040	0,039	0,042	0,005	-,017
Unemployment 2017	0,005	-,041	-,042	0,010	-,058*	-,012
Average income	,053*	,078**	,078**	-,072**	,053*	-,024
Highly Educated	0,019	-,003	-,007	-,070**	,085**	-,057*

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

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

Table A.5: Correlation Matrix

	No Of Remarks Of Payment Total A	A1	A2	B3	B4	B5	C6	C7
Sole Proprietorship	-,064*	-,121**	,065*	-0,037	0,042	-,057*	0,044	,116**
Limited Partnership	-0,017	0,038	-,053*	-,071**	-0,005	,097**	,056*	-0,023
Partnership	-0,041	-,060*	,068**	-0,015	0,040	-0,004	0,006	0,013
PO Box	-0,019	0,018	-0,044	0,044	-0,037	-0,019	-0,031	,057*
Pd Percent	,233**	-,069**	0,029	0,028	-0,047	-0,009	0,013	0,021
Age Application Date	,144**	0,034	0,025	-,092**	-0,036	,073**	0,013	,055*
have Employees	,109**	,055*	-0,014	0,043	-,084**	0,032	-0,027	-0,018
5 or More Employees	,120**	0,012	0,013	,074**	-,059*	-0,013	-,059*	-0,022
10 or More Employees	0,006	,089**	-,022	0,006	-0,037	-0,013	-0,023	-0,041
Commerce	-,076**	-0,006	0,010	-,115**	,135**	0,020	-0,039	,083**
Restaurant	,089**	-,090**	-0,019	,136**	-,100**	0,011	,088**	-,063*
Beauty Salon/ Hair dresser	,056*	,067**	-0,009	0,044	-0,044	-,054*	-0,041	-0,032
Car shop/Mechanics	-0,028	-0,024	0,015	-0,029	0,000	-0,019	-0,015	0,009
Construction	-0,002	,062*	-0,012	-,052*	0,043	0,016	-0,005	-0,014
Cab	-0,028	,092**	0,026	-0,026	-0,044	-0,035	-0,008	-0,031
Cleaning	0,028	-0,016	0,008	0,028	-0,019	0,016	-0,029	-0,027
Company Or Board Events Total	,086**	,087**	-,081**	,053*	-,065*	,084**	-0,035	-,096**
Chattel Mortgage Total	,088**	-0,007	-,117**	,052*	-0,023	,102**	-0,007	0,042
Chattel Mortgage Last 6 months	-0,031	-0,019	-0,032	,086**	-0,037	0,006	-0,001	-0,005
Age Principal	0,049	-0,049	,091**	-,071**	0,025	-0,041	0,007	,062*
Age Principal^2	0,036	-0,049	,092**	-,078**	0,027	-0,037	-0,001	,065*
total Number Of Remarks On Payment Principal	,206**	-,058*	-,052*	0,023	-0,043	0,024	,113**	0,043
No Of Petitions Last 2 Months	,109**	0,034	-0,010	0,015	-0,007	0,043	-0,030	-0,030
No Of Remarks Of Payment Total E	,248**	-0,042	-0,031	-0,003	-0,026	,103**	0,048	0,046
No Of Remarks Of Payment Total A	1	-0,047	-0,019	,085**	-,053*	-0,008	0,025	0,016
A1	-0,047	1	-,262**	-,363**	-,168**	-,135**	-,200**	-,119**
A2	-0,019	-,262**	1	-,240**	-,111**	-,089**	-,132**	-,079**
B3	,085**	-,363**	-,240**	1	-,154**	-,124**	-,183**	-,109**
B4	-,053*	-,168**	-,111**	-,154**	1	-,057*	-,085**	-0,051
B5	-0,008	-,135**	-,089**	-,124**	-,057*	1	-,068**	-0,041
C6	0,025	-,200**	-,132**	-,183**	-,085**	-,068**	1	-,060*
C7	0,016	-,119**	-,079**	-,109**	-0,051	-0,041	-,060*	1
C8	0,014	-,157**	-,104**	-,144**	-,067**	-,053*	-,079**	-0,047
C9	-0,048	-,097**	-,064*	-,089**	-0,041	-0,033	-0,049	-0,029
Newly/Total Reg Comp	-0,018	,389**	,082**	,199**	-,132**	-,187**	-,087**	-,266**
Bankruptcy reg 2017-2012	0,026	,389**	-,062*	,318**	-,240**	-,291**	0,021	-,311**
Bankruptcy reg before 2012	-0,026	-,281**	,118**	-,221**	,096**	,251**	0,025	0,045
Average age 2017	0,027	-,534**	-,217**	-,134**	,191**	,207**	,282**	,289**
Municipality ax 2016	0,001	-,502**	-,210**	,196**	-0,001	,215**	,188**	,130**
GDP	-0,020	,334**	-,122**	-,185**	-0,019	-,103**	-0,007	-0,001
Citizens per km 2017	-0,039	,842**	-,106**	-,334**	-,159**	-,134**	-,198**	-,117**
Share Immigration other	,069**	-,141**	-,191**	,084**	0,022	,190**	,093**	,065*
Immigration 2017/2007	,104**	-,305**	-,071**	-,088**	,071**	,094**	,188**	,233**
Emigration 2017/2007	-0,038	,065*	,264**	-,339**	-,121**	,140**	-0,050	,062*
Unemployment 2017	0,029	-,062*	-0,044	0,039	,166**	-0,018	-0,013	,072**
Average income	-0,027	,402**	,306**	-,221**	-,141**	-,139**	-,135**	-,122**
Highly Educated	-0,029	,657**	0,039	0,031	-,275**	-,233**	-,205**	-,242**

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

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

Table A.6: Correlation Matrix

	C8	C9	Newly/Total Reg Comp	Bankruptcy reg 2017-2012	Bankruptcy reg before 2012	Average age 2017
Sole Proprietorship	0,005	,093**	-,079**	-,075**	-,015	,096**
Limited Partnership	0,030	-0,033	-0,033	-,052*	,052*	0,028
Partnership	0,005	-0,035	-0,009	-,075**	0,040	0,031
PO Box	-0,005	0,005	0,022	0,038	-0,017	0,009
Pd Percent	,058*	0,006	-,054*	-0,020	0,031	0,047
Age Application Date have Employees	-0,002	-0,028	-,070**	-,079**	,064*	,060*
5 or More Employees	0,025	-,125**	,055*	0,048	-,070**	-,067**
10 or More Employees	0,017	-0,051	0,048	0,024	-0,016	-0,043
Commerce	-0,019	-0,028	,062*	,058*	-0,035	-,068**
Restaurant	0,008	0,035	-,113**	-,157**	,105**	,113**
Beauty Salon/ Hair dresser	0,003	-0,022	0,029	,085**	-0,048	-0,002
Car shop/Mechanics	-0,003	-0,039	,056*	,065*	-0,026	-,080**
Construction	,073**	0,051	-0,038	-0,033	-0,010	,051*
Cab	-0,029	-0,028	0,024	0,012	0,014	-0,036
Cleaning	-0,041	-0,025	,112**	,093**	-,066*	-,113**
Company Or Board Events Total	-0,015	,073**	0,022	-0,009	0,028	-0,042
Chattel Mortgage Total	-0,010	-0,030	,060*	0,047	0,012	-0,036
Chattel Mortgage Last 6 months	0,027	-0,032	-0,028	-0,017	,064*	0,044
Age Principal	-0,016	-0,031	-0,006	0,022	0,007	-0,001
Age Principal^2	,055*	-0,021	-0,047	-,087**	,085**	,089**
total Number Of Remarks On Payment Principal	,063*	-0,014	-,056*	-,099**	,090**	,099**
No Of Petitions Last 2 Months	0,012	-0,017	-0,024	0,006	-0,012	,084**
No Of Remarks Of Payment Total E	-0,031	-0,026	0,050	0,030	-0,004	-,056*
No Of Remarks Of Payment Total A	-0,028	0,008	-,068**	-0,036	0,023	,081**
A1	0,014	-0,048	-0,018	0,026	-0,026	0,027
A2	-,157**	-,097**	,389**	,389**	-,281**	-,534**
B3	-,104**	-,064*	,082**	-,062*	,118**	-,217**
B4	-,144**	-,089**	,199**	,318**	-,221**	-,134**
B5	-,067**	-0,041	-,132**	-,240**	,096**	,191**
B6	-,053*	-0,033	-,187**	-,291**	,251**	,207**
C6	-,079**	-0,049	-,087**	0,021	0,025	,282**
C7	-0,047	-0,029	-,266**	-,311**	0,045	,289**
C8	1	-0,039	-,496**	-,386**	,294**	,433**
C9	-0,039	1	-,194**	-,199**	,136**	,330**
Newly/Total Reg Comp	-,496**	-,194**	1	,662**	-,439**	-,733**
Bankruptcy reg 2017-2012	-,386**	-,199**	,662**	1	-,699**	-,671**
Bankruptcy reg before 2012	,294**	,136**	-,439**	-,699**	1	,408**
Average age 2017	,433**	,330**	-,733**	-,671**	,408**	1
Municipality ax 2016	,325**	,120**	-,451**	-,340**	,216**	,501**
GDP	-0,032	,055*	0,050	0,041	-,071**	-,091**
Citizens per km 2017	-,159**	-,098**	,427**	,334**	-,229**	-,506**
Share Immigration other	,203**	-,240**	-,052*	-0,006	-,060*	-0,014
Immigration 2017/2007	,160**	,196**	-,437**	-,374**	,187**	,470**
Emigration 2017/2007	,127**	-0,010	0,015	-,085**	,125**	-0,044
Unemployment 2017	-,081**	-0,010	,130**	0,035	-,098**	0,042
Average income	-,241**	-,086**	,311**	,185**	-0,047	-,356**
Highly Educated	-,338**	-,161**	,527**	,549**	-,324**	-,714**

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

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

Table A.7: Correlation Matrix

	Municipality tax 2016	GDP	Citizens per km 2017	Share Immigration other	Immigration 2017/2007
Sole Proprietorship	,114**	0,005	-,158**	0,045	,108**
Limited Partnership	0,010	,079**	0,027	0,035	-0,004
Partnership	0,028	-0,045	-,068**	-0,013	-0,009
PO Box	-0,021	-0,003	0,009	0,050	-0,038
Pd Percent	0,041	0,003	-,069**	,055*	,102**
Age Application Date have Employees	-0,048	,062*	0,044	-,099**	0,028
5 or More Employees	-,051*	-0,007	,074**	0,029	-,054*
10 or More Employees	-,059*	-0,023	0,044	-0,030	0,021
Commerce	-,123**	,084**	,151**	0,029	-0,032
Restaurant	0,017	0,026	-0,032	-,093**	-0,024
Beauty Salon/ Hair dresser	,065*	-0,004	-,065*	,088**	,063*
Car shop/Mechanics	-,055*	0,025	,068**	0,024	-0,020
Construction	0,041	0,002	-0,024	-0,006	0,009
Cab	-,093**	0,018	,087**	-0,038	-,060*
Cleaning	-,053*	-,052*	,072**	-0,013	-,073**
Company Or Board Events Total	0,008	-,053*	-0,021	0,000	,068**
Chattel Mortgage Total	-,076**	-0,015	,109**	-0,018	-,065*
Chattel Mortgage Last 6 months	0,006	0,026	-0,002	0,036	-0,012
Age Principal	-0,037	-0,004	0,008	0,028	-0,024
Age Principal^2	-,051*	0,016	0,015	-,120**	,061*
total Number Of Remarks On Payment Principal	-,051*	0,018	0,014	-,128**	,064*
No Of Petitions Last 2 Months	0,050	-0,046	-,063*	,059*	,181**
No Of Remarks Of Payment Total E	-,061*	0,004	,069**	0,006	-0,014
No Of Remarks Of Payment Total A	,069**	-0,036	-0,040	0,022	,152**
A1	0,001	-0,020	-0,039	,069**	,104**
A2	-,502**	,334**	,842**	-,141**	-,305**
B3	-,210**	-,122**	-,106**	-,191**	-,071**
B4	,196**	-,185**	-,334**	,084**	-,088**
B5	-0,001	-0,019	-,159**	0,022	,071**
C6	,215**	-,103**	-,134**	,190**	,094**
C7	,188**	-0,007	-,198**	,093**	,188**
C8	,130**	-0,001	-,117**	,065*	,233**
C9	,325**	-0,032	-,159**	,203**	,160**
Newly/Total Reg Comp	,120**	,055*	-,098**	-,240**	,196**
Bankruptcy reg 2017-2012	-,451**	0,050	,427**	-,052*	-,437**
Bankruptcy reg before 2012	-,340**	0,041	,334**	-0,006	-,374**
Average age 2017	,216**	-,071**	-,229**	-,060*	,187**
Municipality ax 2016	,501**	-,091**	-,506**	-0,014	,470**
GDP	1	-,240**	-,718**	,315**	,338**
Citizens per km 2017	-,240**	1	,412**	0,043	-0,021
Share Immigration other	-,718**	,412**	1	-,155**	-,291**
Immigration 2017/2007	,315**	0,043	-,155**	1	,189**
Emigration 2017/2007	,338**	-0,021	-,291**	,189**	1
Unemployment 2017	-,201**	,109**	,241**	,233**	,244**
Average income	-,116**	-,179**	-,121**	-,074**	-,165**
Highly Educated	-,714**	,334**	,629**	-,417**	-,195**
	-,660**	,248**	,700**	-,324**	-,343**

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

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

Table A.8: Correlation Matrix

	Emigration 2017/2007	Unemployment 2017	Average income	Highly Educated
Sole Proprietorship	0,039	,061*	-,163**	-,169**
Limited Partnership	0,041	0,012	0,017	0,021
Partnership	0,018	,059*	-0,039	-,078**
PO Box	-0,010	0,018	-0,017	-0,010
Pd Percent	0,049	0,032	-,069**	-0,050
Age Application Date	-0,027	-0,008	,074**	0,020
have Employees	0,004	-0,002	0,032	,079**
5 or More Employees	0,007	-,067**	,076**	,073**
10 or More Employees	0,046	-0,023	,129**	,111**
Commerce	-,102**	-0,044	-0,008	-,082**
Restaurant	0,045	0,027	-0,044	0,001
Beauty Salon/ Hair dresser	0,027	-0,008	,051*	,077**
Car shop/Mechanics	0,038	-0,005	-0,043	-,071**
Construction	0,020	-0,020	,080**	0,049
Cab	0,049	,051*	0,010	,069**
Cleaning	0,023	-0,019	-0,009	0,005
Company Or Board Events Total	-,051*	-,066*	-,132**	-,112**
Chattel Mortgage Total	-,076**	0,014	-0,004	-0,003
Chattel Mortgage Last 6 months	-0,009	0,005	,053*	0,019
Age Principal	0,040	-0,041	,078**	-0,003
Age Principal^2	0,039	-0,042	,078**	-0,007
total Number Of Remarks On Payment Principal	0,042	0,010	-,072**	-,070**
No Of Petitions Last 2 Months	0,005	-,058*	,053*	,085**
No Of Remarks Of Payment Total E	-0,017	-0,012	-0,024	-,057**
No Of Remarks Of Payment Total A	-0,038	0,029	-0,027	-0,029
A1	,065*	-,062*	,402**	,657**
A2	,264**	-0,044	,306**	0,039
B3	-,339**	0,039	-,221**	0,031
B4	-,121**	,166**	-,141**	-,275**
B5	,140**	-0,018	-,139**	-,233**
C6	-0,050	-0,013	-,135**	-,205**
C7	,062*	,072**	-,122**	-,242**
C8	,127**	-,081**	-,241**	-,338**
C9	-0,010	-0,010	-,086**	-,161**
Newly/Total Reg Comp	0,015	,130**	,311**	,527**
Bankruptcy reg 2017-2012	-,085**	0,035	,185**	,549**
Bankruptcy reg before 2012	,125**	-,098**	-0,047	-,324**
Average age 2017	-0,044	0,042	-,356**	-,714**
Municipality ax 2016	-,201**	-,116**	-,714**	-,660**
GDP	,109**	-,179**	,334**	,248**
Citizens per km 2017	,241**	-,121**	,629**	,700**
Share Immigration other	,233**	-,074**	-,417**	-,324**
Immigration 2017/2007	,244**	-,165**	-,195**	-,343**
Emigration 2017/2007	1	-0,008	,129**	-0,049
Unemployment 2017	-0,008	1	-,214**	-,112**
Average income	,129**	-,214**	1	,694**
Highly Educated	-0,049	-,112**	,694**	1

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

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

