# Access to finance: The likelihood of European SMEs of receiving a bank loan.

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*Abstract*

*This thesis investigates the applications for bank loans by small, medium and large enterprises in Europe and how these applications are related to firm-specific and country-specific factors. For this thesis the data from the Flash Eurobarometer #271 conducted in June 2009 on behalf of the European Commission have been used. Furthermore, country-level data from the European Central Bank and the International Monetary Fund are assembled. By means of binary logit models, this research shows that firm-specific and country-specific factors play important roles in the probability of receiving a bank loan. Specifically, at the firm level the size, age, and profit of a firm have positive influences on the chances of receiving a bank loan. At the country level, it turns out that GDP per capita, inflation and the interest rate have significant relationship with the probability of receiving a bank loan.*

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# 1. Introduction

Policy makers and economists are increasingly focusing their attention on the entrepreneurial and financial activities in the Western world. The need for external financing of a company could be a start towards new innovation, productivity growth, competitiveness, economic growth and job creation. Firms who cannot borrow to maintain their profit-maximizing levels of capital are less likely to survive in comparison with firms who can (Holtz-Eakin et al., 1993). According to Holtz-Eakin et al. (1993) firms that have less liquidity constraints, are more likely to survive and perform better. This problem could be found anywhere in the world for every existing firm. Moreover, in Europe, firms face a challenging task in accessing external financing. The chance of receiving a bank loan after applying for one differs in each country, in part because European countries have different interest rates (Maddaloni, 2009). This research investigates the relevant topic of access to finance, especially by focusing on applications for banks loans by small, medium and large enterprises. By using an international dataset, this research explains the probability of a business receiving the requested amount of bank loan by means of firm-specific and country-specific variables across 30 different countries in Europe, with the Netherlands as the benchmark.

This study will focus on the applications for bank loans by small, medium and large enterprises in Europe and how these applications are related to firms-specific and country-specific factors. This research determines whether the applying firms have received the bank loan or not and it focuses on why this differs across countries in Europe. Existing literature provides many insights into the determinants of the access rate to bank credits and also the accessibilities of firms to loans. The research of Bebczuk (2004) presented several firm-specific factors that explain the access to a bank credits, such as the negative impact of liquidity and lack of asset tangibility. In addition, country-specific factors could explain and determine the likelihood of receiving a bank loan. Another factor that could influence the banks behavior is discrimination, which is likely to be present in a transition economy (Brandt, 2003). In addition to the studies on the determinants of the access rate to bank credits, studies by Berger (1995) and Han et al. (2009) concerning the likelihood of receiving bank loans have shown that small and medium businesses are high-risk profile borrowers, which means that for them applying and receiving a loan is a hard task. The age and the experience of a firm could also play a vital role in the decision of a bank to approve a bank

loan. Thus many factors play a role in the approval of bank loans. These will be addressed in the second part of the thesis.

To investigate the differences between firms within countries and between countries regarding the success of loan applications the following research question is formulated: "*Which firm-specific and country-specific factors determine the likelihood of receiving a bank loan in Europe?*"

In addition, this research is focused on the following additional research question: "*Is the Netherlands the best country for firms to vessel and do Dutch firms have the highest chances of receiving bank loans among all European countries?*" Thus this research will compare the rest of Europe with the Netherlands, which is used as the benchmark.

In this study the differences between the likelihood of receiving bank loans among countries in Europe will be explained on basis of firm-specific variables with data that are taken from the Flash Eurobarometer survey #271. This survey was conducted by the Gallup organization upon the request of the European Commission and the European Central Bank from 17$^{th}$ June till 19$^{th}$ July 2009. Furthermore, country differences regarding the probability of receiving a bank loan are investigated by using country-level data from the International Monetary Fund and the European Central Bank.

The following dependent, independent and control variables are taken into account for this study. The dependent variable measures whether a firm received a bank loan or not. The firm-specific independent variables are: size, age, sector, ownership structure and profitability. The country-specific independent variables are GDP, GDP growth, inflation, interest rate and concentration ratio.

This thesis contributes to the existing literature in the following ways:

Firstly, this research includes a combination of developing countries (low income countries) and developed countries (high income countries), while other studies usually incorporate developing countries or developed countries only. This research thus includes both developing countries and developed countries, which provides a consistent and a more complete interpretation for all countries.

Secondly, this research uses both firm-specific and country-specific variables. Such an analysis at both levels of aggregation is important. This research examines the influences of the firm-specific variables while controlling for the country-specific variables, and vice versa.

Furthermore, this research provides insights into the differences in the rate of acquiring bank loans in different countries in Europe. This could help policy makers and economists to make investment choices in certain countries that offer “easy” loans.

The results of this study are from two binary logit regressions. The first regression contains the firm-specific factors only (country dummies are included as well). The second adds the country-specific factors.

Concerning the first regression, the results indicate that firm size, firm age and the profitability all have a positive influence on the likelihood of receiving a bank loan. The first regression also compares all other countries with the Netherlands as the benchmark country. It appears that firms in Belgium, France, Luxembourg, Austria and Slovenia have a significant higher probability of receiving a bank loan than firms in the Netherlands. Firms from Greece and Spain have a lower probability of receiving a bank loan in comparison with firms from the Netherlands.

Concerning the second regression, the results indicate that GDP and the interest rate in a country have a positive influence on the likelihood of receiving a bank loan. Inflation influences the probability of receiving a bank loan negatively.

The remainder of this study is structured as follows: Chapter two consists of a literature review and the expected results of each variable that will be used in this thesis. Chapter three consists of a description of the data and methodology that is going to be used for this study. This is followed by chapter four, which provides the results of the empirical analysis. Finally, the last chapter will consist of the concluding remarks followed by a discussion of the findings.

## 2. Literature

Efficient finance systems and good economics growth go hand in hand. Countries that have better financial systems stimulate the economic growth by accelerating the rate of productivity enhancement (King, 1993). Moreover, King (1993) has shown that government policies toward financial systems might have an important causal effect in the long run. According to Schumpeter (1912) banks played an important role in the economic growth because they identify and fund entrepreneurs with the best chances of implementing innovative products and processes. Bank loans could have a positive impact and make a significant contribution to economic growth.
The likelihood of receiving a bank loan differs across each country in Europe. In every country banks react differently to the new loans, which are applied by firms. These reactions explain the differences in the country-specific factors or the firm-specific factors.

External financing can be distinguished in three different forms: bank loans, trade credits and other forms of external financing. This research will only focus on the first form of external financing, namely the bank loans. Bank loans can be easily acquired by just simply applying for one, but the receiving end is a different story. The proportion in which the banks would approve a bank loan can be influenced by several different factors. These factors can be distinguished between firm-specific factors and country-specific factors.

The remaining structure of this literature review will be as followed: First, this chapter investigates which firm-specific factors play a role in the likelihood of receiving a bank loan. Second, it will analyze which country-specific factors play an important role in the likelihood of receiving a bank loan. Last, the bank lending behavior could play an important role in understanding the bank side of this transaction. In addition, in the literature review there will be a discussion of the results expectations for each variable.

### 2.1 Firm-specific variables

**Firm size**. The size of a firm plays an important role in the likelihood of receiving a bank loan. Size could affect the chance of receiving a loan in several different ways. The larger the firm size, the more liquidity it needs to fund their bigger activities, here firms tend to rely on external financing, such as, a bank loan, to maintain their activities. But on the other hand larger firms could be doing very well, which means that they often do not need external financing, because of possible excess of profits and funds.

Large firms do not face obstacles that smaller firms have. Smaller firms are more vulnerable to obstacles such as financial, legal and corruption (Beck et al., 2005). These obstacles are mostly face by weak financial and legal institutions and are mostly found in countries with less developed financial institutions and inefficient legal systems.

The reason that some large firms not apply for a bank loan could be asymmetric information. In such case large firms choose internal financing instead of external financing (Schaller, 1993). Small firms are recognized as more opaque with regards to information than larger firms. Moreover, if banks need to collect private information concerning the risks which small business borrowers take, this will cost the banks more (Ang, 1991). Banks will be in a worse position if they lend to small firm borrowers rather than large firm borrowers in this situation. In case of providing finance to small firm borrowers, banks tend to have less information about the small firms than about the borrower himself. In most bargaining situations, it is assumed that banks have better information than the founder of a wholly new business (Storey, 1994). In the conditions of asymmetric information, some small firms tend not to apply for a bank loan, even when they are in need of capital. In this case the small business will be labeled as a 'discouraged borrower'. These small firms are mostly defined as credit worthy borrowers, but they do not apply for a bank loan because they fear a possible rejection (Kon and Storey, 2003). Since the asymmetric information tends to be much more present in small firms than in large firms, it is not surprising that the ways in which these respective groups obtain credit financing differ significantly (Berger, 1995).

But in reality small firms have the same or even a better chance of receiving a bank loan than larger firms. The research by Riding (2001) has showed that in Canada small firms receive a bank loan more quickly, because this was closely connected with the creation of many jobs. The research of Beck et al. (2003) has also showed that small firms use less external finance than larger firms, but small firms benefit much more from better protection of property rights and financial intermediary development in terms of accessing to external financing. In addition, the access to external finance for small firms can improve if there are institutional reforms addressing the weaknesses in legal and financial systems (Beck et al., 2003). Saidenberg and Strahan (1999) have argued that there is a reduction in the role of banks in providing bank loans to U.S. businesses. The decreasing reliance on bank loans has been especially apparent among large firms, this was due to a shift in financial transactions that have moved from banks to the securities markets. Despite the declining role of banks for providing bank loans, banks do play a critical role in providing liquidity to large firms, especially during economic stress periods (Saidenberg and Strahan, 1999).

The variable firm size can have both a positive and a negative effect on the chances of receiving a bank loans. The first possible effect could be that large firms receive more bank loans in comparison with smaller firms, due to fact that large firm face less obstacles than small firms. On the other hand in the condition of asymmetric information, large firms tend not to finance their activities with bank loans. Consequently, the receiving rate of large firms could then drop below the receiving rate of small firms. The overall expectation of this variable will be that large firms will have a higher chance of receiving a bank loan and face less financial constraints in comparison with smaller firms.

**Firm age.** The longer a firm is active in a certain industry or sector, the more business experience it will have. Many factors influence both a firm's demand for bank loans and its ability to obtain bank loans. Firm age is one of these factors. The age of a firm can have both, a positive and a negative relation with the chances of receiving a bank loan for firms.
On the demand side, young firms that are in the stage of expansion will be more likely to have a higher credit demand than older, well-established firms (Robb, 2002). However on the supply side, young firms find it more difficult to secure credits from banks and other institutional creditors because of their limited performance history. There are several other reasons why young firms are at a disadvantage in receiving a bank loan than older firms. Younger firms are expected to apply for less money than older firms, but they often do not receive a bank loan due to the higher risk associated with them and their informational opaqueness (Robb, 2002). Robb (2002) argues that after controlling for firm, owner, and credit history record, young firms are more likely than older firms to have outstanding loans. In addition, young firms often do not have the financing option of retained earnings or to use this as a bargaining chip in receiving bank loans in comparison with old firms. Older firms may face difficulties in financing their investments through internal financing. This may be caused by low cash flow, but on the other hand they have easily access to external financing because they belong to well-established socioeconomic networks built over the years (Fagiolo, 2006).
Human capital could be positively related to creditworthiness and the supply of credit (Robb, 2002). Not surprisingly most young firms are more likely to have young and less experienced owners than their older counterpart. Thus older firms will possess more human capital measured in experience, and have a better chance of receiving bank loans than younger firms. Age could also be a factor in competition for loans. Older firms face a competition from younger firms who want a piece of the market share, so older firms will be more likely to

innovate and try to stay ahead of competitors. In this way they will be in need of (external) financing to achieve this. Older firms have a longer track record, which makes it easier for banks to approve a loan to them over younger firms.
The variable age can have either a positive or a negative effect on the likelihood of receiving a bank loan. Age is closely related to experience. The longer a firm is active in a certain industry or sector, the more experience it will have. Older firms are expected to apply and have a higher likelihood of receiving a loan than their younger counterparts, because of the prestige and the experience they have built over the years. But the chances for younger firms of receiving a bank loan could be as high as their older counter part due to the fact that young and new firms would like a piece of the market for which they need a pretty good idea how to penetrate the market. In this case they are most interesting for banks, because the return on investment could be high and in such case banks could ask for higher interest rate than normal. The overall expectation of this variable is that older firms have a higher chance of receiving bank loans and are at fewer disadvantages than younger firms.

**Firm sector**. The sectors, in which firms are active, play a role in the need for external financing. The activities that are included in this research are: Mining, Construction, Manufacturing, Wholesale or retail trade, Transport, Real estates and other services to businesses or persons. These activities will be divided into four sectors: industry (manufacturing and mining), construction, trade (whole sale or retail trade) and services (transport, real estate, other services to business or people).
Robb (2002) has showed that firms, who are involved in retail and wholesale, were more likely than those in manufacturing to have their loan application approved.
The variable sector is added to the research for it had an effect on whether a sector where a firm is active in plays a role in the likelihood of receiving a bank loan. The expectation for this variable is that manufacturing firms, wholesale and retail will be most likely in need of a large amount of credit. Thus it is expected that the manufacturing, wholesale and retail sector are more likely to receive bank loans and the real estate sector less since the current economic crisis is closely connected with the activities in this sector.

**Owner structure.** The structures of a firm also play a role in the likelihood of receiving a bank loan. Different structures bring different aspect with them, which a bank will take in consideration before approving a loan.
For new business starters with only one owner, research of Marlow (2005), has showed that female owners have a harder time of finding financing for a consequent performance.

Moreover, there is a constrain with regards to access to appropriate funding that is part of a wider system of disadvantages, in which women are negatively stereotyped and that feminine is considered as inferior to the masculine (Marlow, 2005). In addition, women business owners who have received a bank loan are on less favorable terms with the banks than male business owners (Riding and Swift, 1990). Thus, the chances of getting bank loans are expected to be higher for men than for women. Female owners have a bigger barrier than men and their gender is negatively affecting their chances of receiving bank loans.
This kind of discrimination also holds for the ethnic business owners. The study of Blanchflower et al. (1998) has showed that a black owner would face more difficulty in receiving a bank loan, after applying for one, than in comparison with a white owner. Thus this is a similar effect to when male and female owners are applying for loans.
Other types of business structures that have more than one owner are expected to have less difficulty in receiving a bank loan. The firm structures of this group consist of: Shareholders (as listed on the stock market), family or entrepreneurs (more than one owner), other firms or businesses associates and venture capital firms or business angels. For this group the barrier and disadvantage are less than business owners with only one owner. The advantages that this group has are the spread of risk over more owners, network and more liquidity. This would ensure banks more safety.
This ownership structure variable can have several effects on the chances of receiving bank loans. This variable can be divided into two groups, one business owner or more than one business owner. The expectations for this variable will be first of all that female business owners are the least likely business owners to receive bank loans compared to other forms of ownership structures. Secondly, male owners are most likely business owners to receive bank loans, because female owners face greater obstacles than men, in the search for finance. In regards to the overall expectation of this variable about the likelihood of receiving bank loans, the firm structure with more than one owner would be more likely to receive bank loans than single owners. This could be explained by the shared risk for bank owners, they have more safety if something happens because they now can turn to the possession of more owners instead of one.

**Firm profit.** The income is very important for almost all the profit-seeking firms. Secondly the profit (net income after tax) is important for the future of the firm.
For most banks the generated income will indicate whether to approve a loan for the applying firm or not. It is obvious that firms that have reported a constantly increasing profit will be in

a better bargaining position to receive a bank loan than firms that reported a decrease in profit. Thus it could be that (poorly performing) firms that have reported a decrease in their profit could pose a greater risk for banks which could jeopardize future paybacks, for which their chances to receive a loan will decrease.

In another case, the chances of receiving a bank loan for firms who have reported a loss will be exactly the same as firms who have reported an increase or constant profits, but banks will increase the risk premium for these firms for which they pay more in interest (Strahan, 1999). But firms who are having trouble with their finances are willing to pay more in interest to receive a bank loan from a bank with great reputation (Chemmanur and Fulghieri, 1994). Moreover, such firms who have received a bank loan are mostly in financial distress (Chemmanur and Fulghieri, 1994). The firms who see a decrease in their profit can often still receive a bank loan through relationship lending (Berlin, 1996). Relationship lending is characterized by close monitoring of the firms by the banks and by contractual flexibilities. High profit generating firms probably do not need to borrow from a bank due to asymmetric information and they prefer internal financing rather than external financing. But large and profitable firms are able to borrow on better terms and have a better chance of receiving a bank loan (Strahan, 1999). Profitable firms do not face problems such as: higher interest rate, shorter contractual maturity and higher loans, compared to small and less profitable firms. This variable can have both negative and positive influence on the likelihood of receiving bank loans for firms. Mainly, it will be expected that firms who have reported an increase in comparison with a decrease in profits will be more likely to receive bank loans. But the opposite can also be true, if firms are in financial distress they will accept the stricter terms from the bank.

## 2.2 Country-specific variables

**GDP per capita.** The gross domestic product (GDP) is one of the primary indicators for the health of the economy of a country.

The gross domestic product per capita is an indicator that can be used for the comparison between the wealth in economies for each country. The use of GDP per capita is to compare and distinguish the likelihood of receiving a bank loan and general economic developments. Firms that are settled in fast growing economies expressed by GDP growth will also grow faster and also face lower financing obstacles (Beck et al., 2004). Lower financial obstacles mean that more loans will be approved, as well as lower interest rates and less asymmetric information and agency problems. So, firms that are settled in countries that have a higher GDP per capita are expected to face less financing obstacles than firms settled in countries with a lower GDP per capita. In addition, the upcoming firms can use the GDP per capita as a good indication for success and can provide a reason to move to another country in which startups can receive easier banks loans and face less financing obstacles.

Economic growth (GDP growth) is also positively associated with banking development (Levine, 1998). Banking development reduces delay and uncertainty for a bank, in turn banks have a greater confidence in receiving the full present value of their loan, and so they are likely to approve a loan faster.

The variables GDP per capita and the GDP growth can have both a positive and negative effect on the chances of receiving bank loans. The expectations are that these variables will have a positive influence on the likelihood of receiving bank loans. The country with the highest GDP per capita in comparison with other countries in Europe is most likely the one in which it is easiest to receive bank loans.

**Inflation.** Inflation often has a detrimental effect for the economy of a country, the prices go up and the purchasing power decreases. There are several factors that affect the value of a countries currency, such as, the budget deficit and the import and exports deficit. High Inflation is just bad news for most countries and it is, associated with higher volatility of markets and thus it increases economic uncertainty (Loungani and Sheets, 1997).

Inflation can also be positive news for the bank sector of a country. The research of Demirgüç-Kunt (1998) has showed that inflation is associated with higher realized interest margins and a higher profitability for the banks. The positive relationship of inflation and bank profitability implies that the income of banks increases more than their costs. Higher interest margin could affect the appliance rate of bank loans negatively. This will be discussed

in the following part on interest rate. Higher profitability could make the banks more open to giving loans, due to the (maybe) excessive money they now possess, which can affect the receiving rate of bank loans positively.
Inflation has a negative effect on firms due to the fact that consumer prices rise and the sales drop because people just have less to spend. But on the other hand inflation could also play a positive role for firms that are applying for bank loans. Consequently, if banks in countries with higher inflation realize more interest margins and have a higher profitability, these banks could approve a bank loan much easier. But inflation will most likely reduce future investments (Loungani and Sheets, 1997).
This country level variable will be expected to go either ways, positive or negative in relation to the chances of receiving bank loans by firms. The positive relationship of inflation and bank profitability implies that the income of banks increases more than the costs with inflation, which can influence the chances of receiving a bank loan positively. Firms who are settled in countries with higher levels of inflation than in comparison with other countries are expected to receive a bank loan much faster.
The higher interest margin, which is associated with inflation, could affect the chance of receiving a bank loans negatively. This will be discussed in the following section on the interest rate.

**Interest rate.** The interest rate, which varies for each country, also plays a significant role in the chances of receiving bank loans. The interest rate depends on the interaction at the margin between the supply of new bank loans due to ex-ante savings and the demand for bank loans, which arise from the ex-ante investment (Keynes, 1937). Moreover, the interest rate is determined by the current stock of money and the current state of liquidity that is at hand at the moment of approving the bank loan (Keynes, 1937).
A high rate of interest plays an important factor for a firm, which is contemplating whether to apply for a loan or not. A high interest rate could be the downfall for firms, who are not able to pay back their debts. A high interest rate could be correlated with inflation. According to the research of Demirgüç-Kunt (1998), when inflation occurs in a country, the interest rate will also rise. When inflations occur, then this could trigger the banks to approve loans more easily because of the higher earnings.
For the firms, inflation could be a negative spiral, because the consumer prices rise but the purchasing power of consumers drops and on top of that the cost for a bank loan rises, which discourage firms from applying for a bank loan.

This country level variable could also affect the chances of receiving a bank loan in a positive and negative way, like the variable inflation. If inflation occurs then, according to Demirgüç-Kunt (1998), the interest rate will rise. This will give banks a higher motivation to give out a bank loan more easily because of the higher earnings. On the other hand the cost of firms will increase and this will discourage applying for a loan in comparison with the past experiences and in this case firms will deny the bank loan offer.

### 2.3 Bank behavior

This part will cover the supply side of the bank loans, namely, the banks itself. The chance of receiving bank loans also depends on the characteristics that for each bank differ. Several aspects play a role, which can influence the likelihood of receiving bank loans negatively or positively.

Each bank has a "banking lending behavior", for the understanding of the banks and their behaviors, it is important to see which factors play a role before a bank will approve a bank loan. The closest term for understanding this behavior is the term 'asymmetric information', which plays a big role in the lending behavior of banks. Asymmetric information arises often in the cases of firms applying and trying to receive a bank loan. In this case firms have more superior (insider) information than the banks, which can cause a harmful situation for the banks, because firms can take advantage of the banks lack of knowledge. This can lead to agency cost, but it can be resolved with a better relationship between the banks and firms. Most large firms stay with the same bank that they already have a relationship with. This is because of asymmetric information, aside from the fact that those banks may offer the best deals. They also stay with the same banks, because they would have to convey a lot of information about their performances to other banks if they switch to another bank. Fama (1985) and Kane and Malkiel (1965) have argued that banks that actually lend to firms learn more about the borrowers characteristics than others banks that do not. The degree to which banks could take advantages of the information that they have gathered over time and use it efficiently to adjust investment decision depends in part upon the ability to extract rents. This could also be viewed as clear and obvious, because more lending could also bring more data on the behavior of the barrowing firms. For banks, the relations with its costumers arise endogenously as a consequence of the asymmetric evolution of information set (Sharpe, 1990).

Risk also plays a role before banks approve a loan. Risk premiums are mostly based on the information that the banks can gather or receive about the applying firm, the less information the higher the risk premium. The recovery rate is also important for the banks. The recovery rate is defined as the payback quota of bank loan borrowers. The more data the bank can gather over borrowers, the more precise will be the risk premium. Starting and young firms will mostly face more difficulties in financing their activities with a bank loan and at a higher risk premium than older firms who already have a longer history. In addition, relation-specific capital investment is important. For firms it is important to maintain their relationship with

banks thus this can result in lower interest rates and easier approval of requesting bank loans. This will especially be the case when firms are facing difficulties in finding financing for their activities and the capital market is limited (Weinstein and Yafeh, 2002).

**Concentration index.** Competition can lead to lower profits, this is also the case in the bank sector. When there is a competition among banks, then most banks will approve bank loans faster and offer lower interest rate for applying firms, even when banks do not know the firm at all (Sharpe, 1990). More banks in an area means more competition, thus this could be associated with a possible higher chance of receiving a bank loan. In such situation do most poor performing firms profit, because poor performing firms could employ greater proportion of the capital, when there is more competition and in a symmetric scenario than in comparison with a normal situation with less competition, consequently poor performing firms have a better chance of receiving loans. But mostly if bank concentration increases, so does the financing obstacles for firms and this will decrease the probability of receiving a bank loan (Beck et al., 2003). In addition, Beck et al. (2004) found that bank concentration increases financing obstacles with a stronger effect for the small and medium sized firms in comparison with the large firms. Thus this effect was only significant for economically and institutionally less developed economies but was insignificant for institutionally, financially, and economically well developed economies.

The effect of bank competition can be measured with the Herfindahl index. If an increase in the Herfindahl index occurs, this generally indicates a decrease in competition and an increase of market power, whereas a decrease indicates the opposite.

The variable of banks is covered with the concentration index, which can have a positive or a negative influence on the likelihood of receiving bank loans. This index provides a means of quantifying the extent to which inequalities in rate of bank loans are more noticeable in some countries than in others. The concentration index is defined with reference to a concentration curve. The curve of the concentration index will consist of the x- axis indicating the cumulative percentage of the sample, ranked by rate of receiving bank loans, beginning with the lowest possible receiving rate, and on the y-axis indicating the cumulative percentage of the banks variable corresponding to each cumulative percentage of the distribution of the rate of receiving bank loans variable. If there is competition between banks, the chances of firms receiving a bank loans is higher. But the opposite can also be true, with an increase in financing obstacles the receiving rate could drop. Overall it is expected that this variable will have a positive influence on the likelihood of receiving bank loans.

## 3. Data and Method

The survey being used was conducted by the Gallup organization upon the request of the European Commission and the European Central Bank from 17th June till 19th July 2009. In this survey (Flash Eurobarometer # 271), all interviews were conducted by telephone and a total of 9000 observations were made which cover over 8300 small and medium-sized enterprises, and 700 larger enterprises that are spread over 30 countries. Additional data concerning the country-specific variables are available from the International Monetary Fund and the European Central Bank.

### 3.1 Data

The variables that will be used in this research are displayed in table 1. The main variables that will be used in this thesis will be defined as follows.
This research will focus on a data set with a total of 1942 firms that did actually apply for a bank loan. Furthermore, the data consist of firms that were applying for other forms of financing than bank loans. In total 1810 firms were applying for other forms of financing than bank loans, thus these firms were dropped from the research because this would affect the results and the focus here is on financing through bank loans only.

"Receiving bank loans" – The main dependent variable pertains to two survey questions. The first question attempts to separate firms that apply for a bank loan and firms that did not apply for a bank loan. The second question is separating the firms with respect to the amount of received bank loans. The firms that apply for a bank loan will act as the main dependent variable. Table 2 shows that 64,37% of the total firms did manage to receive the full bank loan and 18,69% of the firms only receive a part of the bank loan. The rest of the samples consist of firms that did not receive a bank loan or rejected the bank loan. In the analysis of this research the main dependent variable consist of four responses, which will be converted to three responses:

1. Received nothing (consist of the respondents of firms that did not receive any bank loan and firms that refuses the bank loan.)
2. Received the bank loan partly
3. Received everything of the bank loan

For the regressions, two dummy variables are postulated with two possible outcomes. The first dummy variable (*recloan*)[1] consists of two values 1 and 0. The value of 1 captures the responses of firms who have received a bank loan or only part of it, which account for 83% of the sample. The value of 0 represents firms that refused the bank loan or were rejected by the banks. This value accounts for 17% of the sample.
The second dummy variable (*recloan1*) also consists of two values, 1 and 0. The value of 1 represents the response of firms that received a bank loan, which account for 64% of the sample. The value of 0 captures firms that only received a part of the bank loans and firms that did not receive any bank loans, which account for 36% of the sample.

The firm-specific variables that will be used in this thesis will be defined as follows:

"Size" – This variable measures the size of the firm in terms of the number of employees. The range of this variable is from 1 to 60,000 active employees. This variable captures four different categories of firm sizes.
The first category will consists of firms that only have 1 to 9 employees and are called micro firms, which accounts for 32.96% of the sample. This will also be the reference category in the analysis.
The second category will consists of firms that have 10 to 49 employees and will be called small firms in this research, which accounts for 34,35% of the sample.
The third category will consists of firms that have 50 to 249 employees and will be called medium firms in this research, which accounts for a total of 22,91% of the sample.
The last category consists of the largest firms that have over 250 employees, which accounts for a total of 9,78% of the sample.

"Age" – This variable represents how old is a firm. In this dataset the firms were established from the year 1552 till 2009. In regards to this variable, there is a huge gap of difference in age between the oldest and the youngest firm in this sample. The data set that this research employ was collected in 2009, which will also be the base year for age of the firms. This variable will be divided into five different age classes:
The first category consists of the youngest firms that had been registered for less than 2 year (>2), established in 2008-2009, which accounts for only 3,66% of the sample. This will also be the reference category in the analysis.

[1] Note: In this variable there were 170 samples that does not have any responses concerning receiving a bank loan or not, which was dropped from the data. A total of 1942 observations remained.

The second category consists of firms that had been registered for two or more years but less than five years (2-5), established in 2004 to 2007, which accounts for 12,51% of the sample. The third category consist of firms that had been registered for five or more years but for less than ten years (5-10), established between 1999 to 2003, which accounts for 16,27% of the total sample.
The fourth category consists of the oldest firms that had been registered for more than ten years. This category (+10) consist of registered firms from 1998 and older, which accounts for 67,56 % of the total sample.
For the last category there were no data available on the year in which they were registered but this is only a small group of the sample, which only accounts for 3,5% of the total sample and will be dropped as missing values.

"Sector" – This variable represents the activities of the participating firms, which can be divided into seven different categories. Summing up from the activity with the highest observation to lowest observation respectively: other services to businesses or persons (29,2%), wholesale or retail trade (25,9%), manufacturing (23,89%), construction (14,26%), transport (3,86%), real estate (2%) and mining (0.88%). These activities could be put together into four sectors:
The first sector 'industry' will consists of two activities: manufacturing and mining, which accounts for a total of 24,77% of the total sample.
The second sector 'construction' will only consist of the activity construction, which accounts for 14,26% of the total sample. This will also be the reference category in the analysis.
The third sector 'trade' also consists of only one activity namely wholesale or retail trade, which accounts for 25,9% of the sample
The last sector 'services' consists of the activities transport, real estate and other services to businesses or persons, which accounts for a total of 35,07% of the sample.

"Firm structure" – This variable list the ownership structure of a firm in seven possible ways, namely: Shareholders (as listed on the stock market), family or entrepreneurs (more than one owner), other firms or businesses associates and venture capital firms or business angels, only one owner who is male, only one owner who is female, and others. But the last group will not be taken in consideration due to the lack of specification what exactly 'others' means.
Most of the firms have a family or entrepreneur structure, which accounts for 52,03% of the sample, followed by the structure that only have one owner who is male with 18,10% of the

sample. This dummy variable had been made in order to divide the owner structures into 4 categories:
The first category consists of the owner structure with one female owner, which accounts for 3,29% of the sample. This will also be the reference category in the analysis.
The second category consists of the owner structure with only one male owner, which accounts for 18,73% of the sample.
The third category consists of the owner structure headed by families or entrepreneurs, which accounts for 52,03% of the sample.
The last category of the owner structures is shareholders, other firms or business associates, venture capital firms and other forms of owner structures, which accounts for 26% of the sample.

"Income generator" – This variable measures the profit of a firm. It will only consist of data concerning whether the profit of the firms have increased, decreased or remained unchanged over the past 6 months. The majority of the firms have seen their profitability decreased over the past 6 month, they account for 62,05% of the total sample. This will also be the reference category in the analysis. Only 16,22% of the sample had seen their profit increased over the past 6 months. For almost 21% of the sample, the profit was unchanged over the past 6 month. There were also a total of almost 5% that were unclear about their profit margins, thus these were dropped from the data.

The country-specific variables that will be used in this thesis will be defined as follows:

"Country" – These country dummy variables will serve as a control variable in the first binary logit regression. The Netherlands accounted for 2.37% of the total sample, and it will be the base category with which the other countries will be compared. Four countries namely Germany, France, Spain and Italy represent 50% of the data sample.

"Gross domestic product (GDP)" – The International Monetary Fund provided the data on GDP per capita in current prices for the analyses. This data consist of the GDP per capita of each country in the survey in 2009. The variable consists of data from the current rates of each country expressed in US dollars to make comparisons between countries easier. The range of this variable is from 7502,9 till 94417,7.

"Gross domestic product growth" – To obtain this data, the value of this variable was obtained by comparing the GDP per capita for 2008 and 2009 which was available from the

IMF. These values are the differences of the GDP per capita expressed by US dollars between 2008 and 2009, they will show whether there is a growth in the GDP per country. The values were all negative. There was no growth in GDP from 2008 to 2009 for any country in the sample. Thus all advanced economies in the world had negative growths except for Japan and China. But this is not odd for this data sample, taking into consideration the economic crisis that started in 2008. This could also affect and reflect on all GDP growth data in 2009. Between the years 2008 and 2009, the smallest change of GDP was 5,6% and the biggest change was 30,5%.

"Inflation" – This variable consist of data compiled by the IMF. To obtain this data the GDP Deflator (index) was used for the estimation of inflation. The inflation rate of a country is measured by dividing the current price of GDP by the constant price of GDP per country. In every on of the countries of the sample, there was inflation except for one country that had deflation. The smallest value of inflation is 5% at the base year (2000) and the largest inflation that was measured in comparison with the base year was 414%.

"Interest rate" - The data available for this variable is retrieved from the European Central Bank (ECB). The results are from the statistical data warehouse of the ECB from the year 2009. Since the interest rate changes each month, this thesis will focus on the data from June 2009, since this data is the closest to date on which the survey from the European commission was conducted. Out of the 30 countries in the sample, only interest rates for 26 were available, but this will not affect the result much, because this research is focused on the important and advance economies for which the rates are available. The value of this variable ranges from smallest 3,45% to largest 12,75% in June 2009.

"Concentration index" – This variable indicates the concentration ratio of banks in a country and can be measured in several ways. The first measurement was populations per credit institution. This could be a good measurement but sometimes there is a bias in small and large countries with big differences in population's and concentrations ratio. Another measurement is the Herfinhdal index. This index is made particularly to measure the size of firms in relation to the industry and it is an indicator of the amount of competition among them. Thus this research will make use of the Herfinhdal index ratio. When the index ratio of the Herfinhdal index is high, there is a decreasing in competition but an increase in market power, and vice versa. This variable of the concentration index ranges from 206 to 3120. In Germany that had the smallest value of the sample, there is a high rate of competition but a

decrease in market power, whereas in Finland that had the highest value of 3120, there was little competition but the market power was the highest.

### 3.2 Method

This research will continue with only the second dependent variable (recloan1) as its main regression.

The results will be based on the following two main binary logit regressions:

$$P(Recloan1 = 1) = F(\beta 0 + \beta 1.(Dsize) + \beta 2.(Age) + \beta 3.(Sector) + \beta 4.(Downer) + \beta 5.(Profit) + \beta 6.(Country))$$

$$P(Recloan1 = 1) = F(\beta 0 + \beta 1.(Dsize) + \beta 2.(Age) + \beta 3.(Sector) + \beta 4.(Downer) + \beta 5.(Profit) + \beta 6.(GDP) + \beta 7.(GDPchange) + \beta 8.(Inflation) + \beta 9.(Interest) + \beta 10.(Concentration))$$

Where $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$, $\beta 6$, $\beta 7$, $\beta 8$, $\beta 9$, and $\beta$ 10 are the parameters to be estimated.

The results of this research are from two binary regressions. The first model consist of only the business and industry specific variables plus all the countries. The second model consists of the business specific variables plus the country-specific variables.

### 3.3 Sample selection

The characteristic of this research data consists out of a sample selection. The type of research and the research question determine the nature of sample selection. In addition to the two regressions utilized in this research, there will be another method of analysis. The Heckman selection model will be used as a robustness test of the two main regressions, since the sample selection could make this research biased. The Heckman selection model contains two equations, namely the outcome equation and the selection equation. The outcome equation is of interest here, with the selection equation serving to model the selection process. In order to use the Heckman selection model, a second main dependent variable was generated, namely, the appliance rate of firms to bank loans. This new dependent variable will cover all the firms from the original data set, which total to 8869 firms[2]. This dependent variable also consists of two values:

[2] The original participating firms consisted of a total of 9000 firms, but in some cases the firms did not give a concrete answer about their status, therefore they were dropped in this dataset

Value 1[3] will be assigned all firms that have 'applied' for financing through a bank loan.

Value 0 will be assigned to all firms that 'did not apply' for the financing by means of a bank loan.

Another requirement for this test is to postulate a new variable, which is not in the original regression but it is connected to it. This model is about identification of the parameters, in order to make sure that the new estimated parameters only have one interpretation. The new variable had to meet one requirement. The new variable had to influence the outcome equation, but not influence the selection equation. Since this variable did not have the right qualities to be used in the original two regressions, it fitted well in the Heckman selection model.

The following two Heckman selection model is used in this study as a robustness check for the original two regressions:

(Heck) Pr (Recloan1 = 1) = (F (β0 + β1.(Dsize) + β2.(Age) + β3.(Sector) + β4.(Downer) + β5.(Profit)), and

Pr (applied = 1) = F (β0 + β1.(Innovationprocess) + β2.(Dsize) + β3.(Age) + β4.(Sector) + β5.(Downer) + β6.(Profit))

(Heck) P (Recloan1 = 1) = (F (β0 + β1.(Dsize) + β2.(Age) + β3.(Sector) + β4.(Downer) + β5.(Profit) + β6.(GDP) + β7.(GDPchange) + β8.(Inflation) + β9.(Interest) + β10.(Concentration)), and

Pr (applied = 1) = F (β0 + β1.(Innovationprocess) +β2.(Dsize) + β3.(Age) + β4.(Sector) + β5.(Downer) + β6.(Profit) + β7.(GDP) + β8.(GDPchange) + β9.(Inflation) + β10.(Interest) + β11.(Concentration))

Where β1, β2, β3, β4, β5, β6, β7, β8, β9, β10, and β11 are the parameters to be estimated.

[3] Note: that the value 1 of the applied dependent variable consists of all the firms that is in the dependent variable of recloan1.

# 4. Results

This section will elaborate on the results of the empirical analysis. First, a test for multi-collinearity was carried out. This was followed by two binary regression models each with its own set of variables. The first regression is to test the chances of receiving a bank loan between firm-specific factors and countries. The second regression is to test the chances of receiving a bank loan between firm-specific and country-specific variables. After this, simple interpretation will be made followed by the use of a more specific method, namely, the marginal effects. The marginal effect is a good approximation of the amount of change in Y that will be produced by calculating what the effect is when the variable X increases with one unit, the change in the probability. A marginal effect of an independent variable X is the partial derivative, with respect to X, of the prediction function F.

## 4.1 Multi-collinearity

Multi-collinearity can be tested with a correlation matrix with p-values. Table 3 shows that there are no high correlations between the firm-specific variables. Regarding the country-specific variable, there were some high correlation found between the interest rate and other variables. This will be account for in the second regression model through adding all country-specific variables to the model separately.

## 4.2 Results first model

There are expectations made about the results beforehand to test the relationship between firm-specific factors and all the 30 countries and their extent in the likelihood of receiving bank loans. It is also possible to calculate the effect of each variable on the chances of receiving bank loans with the marginal effects. The following interpretations of the results are from table 4.

The binary logit test shows that the size of a firm does affect the success rate of receiving bank loans after applying for one. Firms in the third size class (50 -250 employees) and in the fourth class the largest firms (>250 employees) have a higher likelihood of receiving a bank loan in comparison with firms from the first and smallest size class (1-9 employees). More precisely, firms that are in size class 3 and 4 are 8.1-percentage point ($p<0.01$) and 7.5-percentage point ($p<0.10$) respectively more likely to receive a bank loan than compared to the smallest firms in size class 1.

In addition, the age of a firm affects the success rate of receiving a bank loan positively. The oldest firms (established before 1999) have a higher likelihood of receiving a bank loan in comparison with the youngest firms (<2 years). Firms that are established before 1999 are 12.1-percentage point ($p<0.10$) more likely to receive a bank loan as compared to the youngest firms.

All firms that are active in other sectors than the construction sector have a higher likelihood of receiving a bank loan than in comparison with firms in the construction sector. More precisely firms that are active in the industry, trade and the service sector have a higher probability of successfully receiving a bank loan with 6.9-percentage point ($p<0.10$), 8.9-percentage point ($p<0.05$) and 6.4-percentage point ($p<0.10$) respectively in comparison with firms active in the construction sector.

All ownership characteristics have the same chance of receiving a bank loan. The structure of a firm does not play a role in the success rate of receiving a bank loan.

The profit growth of a firm does play an important role in determining whether a bank will approve a bank loan for the applying firm. For the firms that have reported an increase in their profit over the past 6 month and firms that have reported no change in profitability have a higher likelihood of receiving a bank loans than in comparison with firms that have reported a decrease in profit over the past 6 month. More precisely, firms that are making profit or reported no change in profitability are 6.1-percentage point ($p<0.05$) and 8.1-percentage point ($p<0.01$) respectively more likely to receive a bank loan than compared to firms who have reported a decrease in profit.

The last variable compared all the firms that were established in different countries in Europe with the firms that were established in Netherlands as a base category. Beginning with all the firms that are established in the other countries and were less likely to receive a bank loan compared with firms that are established in the Netherlands. Firms that are established in Greece or Spain have a lower likelihood of receiving a bank loan in comparison with firms that are established in the Netherlands. Firms in the Netherlands have a higher probability of receiving a bank loan than compared with firms from Greece and Spain with 17.4-percentage point ($p<0.10$) and 14.8-percentage point ($p<0.10$) respectively. However firms that are established in Belgium, France, Luxembourg, Austria and Slovenia have a higher likelihood of receiving a bank loan compared with firms from the Netherlands with 21.3-percentage point ($p<0.05$), 23.5-percentage point ($p<0.10$), 25.7-percentage point ($p<0.05$), 19.7-percentage point ($p<0.05$) and 20.6-percentage point ($p<0.05$) respectively.

Notably this thesis will measure what kind of influence the marginal effect will have. To measure the impact of the marginal effect, the base probability of a firm receiving a bank loan after applying for one had to be calculated, which is in both regression models 64%. Moreover, the marginal effect measures how the probability of receiving a bank loan is being influenced. Thus by an increase of one unit of the independent variables, the probability is influenced positively. To measure a small change in the probability of receiving a bank loan there must be a high marginal effect before a significant increase is feasible, because of the high chance of receiving a bank loan already. In this regression, the smallest marginal change what could be possible is 6.1%, which is approximately about 10 times smaller than the benchmark, thus a 1 unit change would result in an increase by 10 percent (rather than percentage point) of the probability of receiving a bank loan.
In this way, the marginal effects have a huge impact on the chance of receiving a bank loan. Particularly, in the country where differences are very high, apart from the size, age, industry and profit, the chance of receiving a bank loan is being very much influenced by the origin of a firm. The differences between the countries will be investigated further in the second marginal regression, which will investigate what are the causes for these huge differences between countries.

### 4.3 Results second model

The second model will distinguish the country variables in the first model from country-specific variables. The second model will only have a short discussion on the differences between the firm-specific variables of the first and second model, because the second model is explicitly only interested in the influence of the country-specific variables. Moreover, there are expectations made beforehand about the results to test the relationship between firm-specific factors and country-specific factors and their influence on the likelihood of receiving bank loans. The following interpretations of the results are from table 5.

There are only slight differences for the firm-specific variables in the first and the second regression models. The first difference is that now all firm sizes in the second regression model are significant. The larger firms have a higher probability of receiving bank loans in comparison with the smallest firms. Firms in the size class 2, 3 and 4 have a higher probability of receiving a bank loan with 5.3- percentage point ($p<0.10$), 9.0-percentage point ($p<0.01$) and 8.7 percentage point ($p<0.05$) respectively in comparison with the smallest firms

size class. The coefficient capturing the oldest firms now loses its significance. In the first regression model, it was already at significance 10% level. The same holds true for the service sector variable.

Regarding the country differences, the following results can be observed.

The GDP of a country plays a positive role for the likelihood of receiving bank loans. The effect of this variable is such that firms in countries with a higher GDP level than other countries are more likely to receive bank loans. The probability of firms receiving a bank loan increases with 0.4-percentage point ($p<0.01$), if GDP increases by a factor of 1000 units.

If there were inflation in a country, this would affect the chance of receiving bank loans negatively. The presence of this variable means that firm in countries with a higher inflation rate than other countries are less likely to receive bank loans. An increase of one unit of inflation in a country will cause a decrease in the probability of receiving a bank loan with 0.1-percentage point ($p<0.01$).

The interest rates also play a significant role in the chances of receiving bank loans for firms. This country level variable plays a positive role in the chances of receiving a bank loan. The higher this variable is in a country, the more likely it is for firms in that country to receive bank loans. If there is an increase of one unit in the interest rate of a country, this will produce an increase in the probability of receiving a bank loan with 2.4-percentage point ($p<0.05$).

The second model will also account for the multi-collinearity between the interest rate and the other country-specific variables. To test the robustness of the result, this research will deviate from a simultaneous inclusion of all country-specific variables, and instead it proceed by adding each variable separately to the model. The only variable that changes while adding other variables was the GDP growth. This was changed from significant to insignificant while adding more variables to the model. The P value of the rest of the country variables is almost identical when they stand alone in the model or together as one. There was a slight difference when the variable inflation and interest were separately put together in one model, this would cause the p-value of interest rate to .992 and the p-value of inflation to 0.000. But this is not surprising because the correlation between these two variables were high.

The marginal effect in the second model differs from the first model and it does not have a huge impact as the first model. Most importantly in the second model, there was an attempt to determine what the causes are for the country differences. In this regression the highest marginal change which could be possible for the independent country variable is 2,5%, which is approximately about 26 times smaller than the benchmark, thus an 1 unit

change would result in an increase by 3,9 percent (rather than percentage point) of the probability of receiving a bank loan. This only applies for the interest rate of a country, the marginal effect of the other two country independent variables GDP and inflation are negligible.

### 4.4 Results sample selection model

The results of the two models above only pertain to firms who have applied for a bank loan and not to firms who did not apply for a bank loan, thus this can mean that there is a biased in the sample selection. The weakness that the two above models have is that they do not take into consideration that variables such as age or size could play an important role in determining whether firms apply for banks loans. Some firms do not apply for a bank loan because they are too old or they are too small to even have a chance of receiving a bank loan. The above model therefore neglects a large class of firms.

With regards to the sample selection, the Heckman selection model is used just to make sure that the results are reliable and as robustness test. The result of the Heckman selection model showed that the results do not differ much from the original two logistic regressions above. It is then safe to assume that the main results are reliable.

### 4.5 Possible explanation and assumptions

This section will try to elaborate the significant and the insignificant results and therefore it attempts to give a possible explanation for the results of each variable.

The size of a firm plays an important and significant role in explaining the probability of the receiving bank loans. Large firms receive more bank loans than smaller firms. One of the possible explanations that larger firms receive more bank loans than smaller firms could be that larger firms face fewer obstacles than smaller firms (Beck et al., 2005). Smaller firms are more vulnerable to obstacles such as financial and legal mismanagement or corruption, which mostly occurs in countries with less developed financial institutions and inefficient legal systems.

In addition in a situation of asymmetric information, smaller firms are in a more disadvantage bargaining position than large firms (Berger, 1995). Banks do not have much information about smaller firms, which means that they pose a higher risk to banks than larger firms. Moreover, since asymmetric information are more likely to be present in small firms than in large firms is often a reason for small firms not to apply for bank loans in fear of possible

rejections.
The results about the firm size classes are in line with the expectations beforehand and most studies.

This research shows that the older firms are more likely to receive more bank loans than the younger firms. There could be several explanations for this result.
Older firms are in a better bargaining position with bank loans. They have a longer track record, more experience, better connections and more financing options, which makes it more likely for them to get bank loans than younger firms (Fagiolo, 2006; Robb, 2002).
Young firms are more risk associated. They are characterized by informational opaqueness and have a limited performance history. These factors put them in a worse bargaining position when it comes to bank loans (Robb, 2002).
These factors when combined could explain why this research reached these results. The results of this research confirmed that older firms have a higher likelihood of receiving bank loans, which could be expected with the higher advantageous that the older firms acquire over time.

In case of the sector variable, there are no clear explanations found for all the results. But it was assumed that the activities such as real estate or manufacturing, often require more investment and liquidity than the reference category, and therefore they have a high likelihood of receiving loans. The result is in line with the expectation beforehand.

The business structure of firms was not significant. This was not exactly in line with the earlier expectations or the previous studies. Most studies show that female business owners could face greater obstacles in search for finance compared to their men counterpart, but the result of this research showed no differences. Moreover, it was expected that the business structures with more than one owner would mean a higher likelihood of receiving bank loans, because they pose less risk to banks, have better network and (mostly) possess more liquidity.

The results showed that profit was significant and played a positive role in the chances of receiving bank loans. This is obvious, firms that are making profit or perform consistently have a better chance of receiving a bank loan than firms who have reported a decrease in profit. Profitable firms are at a better bargaining position, pose less risk and receive better terms when it comes to applying for a bank loan (Strahan, 1999). The results from the effects of this variable are in line with the literature and the expectations beforehand.

The result shows that there are differences among European countries concerning the chances of receiving bank loans. To explain these country differences, the link had to be made between the first regression and the second regressions. In this way country-specific factors could explain these differences.

First of all, the GDP per capita plays a crucial role in determining the country differences. Second the GDP per capita influences the chances of receiving bank loans positively.
One of the possible explanation for this positive influence is that firms who are settled in fast growing economies expressed by GDP growth, face less financial obstacles (Beck et al., 2004). The GDP growth is also associated with bank growth, which could improve the chances of firms receiving a bank loan (Levine, 1998). This is also in line with the expectations, firms established in countries with a high GDP per capita in comparison with other countries in Europe should have the best chances of receiving bank loans.

Inflation has a negative influence on the chances of receiving a bank loan, this result can have several explanations. First of all, inflation could affect the performances of a firm and the future investments negatively. Consequently this effects its bargaining position badly when applying for a bank loan (Loungani and Sheets, 1997). Second, on top of this, inflation is associated with higher interest margins resulting in higher profitability for bank, which will discourage new firms from applying for bank loans. In this case firms already have two disadvantages, which make the terms of receiving a bank loan worse.
There was both some positive and negative expectation beforehand about the effects of inflation. The result showed mainly a negative impact, which is in line with previous studies.

Interest rate have a positive influence on the chances of receiving a bank loan, this result can also have several explanation. First of all, a higher interest rate is positively correlated with a higher profitability for banks, which on the bank side triggers a higher willingness to approve bank loans (Demirgüç-Kunt, 1998). Secondly, even when the interest rate is high, if the firm can borrow from the banks to cover its costs, they will accept the offer, even in worse conditions.
There was both some positive and some negative expectation beforehand about the effects of this variable. The results mainly showed a positive impact, which was in line with previous studies

The concentration ratio did not influence the chances of receiving bank loans. This was neither in line with the literature nor the expectations of the variable. This variable was expected to have a positive effect on the chances of receiving bank loans, because competition leads to lower profit for banks, and consequently bank tends to approve a bank loan faster (Sharpe, 1990).

## 5. Conclusion

This section will summarize the previous chapters and it tries answer the following research questions:

"*Which firms- and country-specific factors determine the likelihood of receiving a bank loan in Europe?*"

"*Is the Netherlands the best country for firms to vessel and do Dutch firms have the highest chances of receiving bank loans among all European countries?*"

This research aims to provide a clear view on the relationship between the likelihood of receiving bank loans and the firm- and country-specific factors. For this research there were two regressions to test this relationship. The first regression consists of firm-specific factors only. The second regression consists of the firm-specific factors and the county-specific factors.

Based on the results, it can be argued that both firm and country-specific factors influence the chances of receiving bank loans. It has also become apparent that the likelihood of receiving a bank loan significantly differs across countries.

As for the firm-specific factors, the size of a firm has a positive influence on the chances of receiving bank loans in both regression models.
These results may be very interesting for policy makers. Small firms mostly face greater difficulties than larger firms when it comes to applying for a bank loan. This could jeopardize future growth and investments in the company and eventually affect the economy negatively. Findings of previous research have showed that the success of small firms in receiving a bank loan is correlated with job creations. Policy makers could try to make it easier for small firms to acquire a bank loan. Small firms must prepare better and bear a greater burden to show that they will be successful. Consequently, this could stimulate the economy and create new jobs.

The age of a firm also plays a positive role in the likelihood of receiving bank loans. One should therefore keep in mind that reputation and experience play an important role in receiving a bank loan, and this will (mostly) only come with the years. The longer a firm is active in an industry, the more experience it will have and a longer track record, which improves the chances of receiving a bank loan. Another implication here could be that the older firms are more reliable and have built their reputations by paying off their debt in good

faith. Firms are recommended to stay with the same bank that they are already familiar with, and therefore they will be more likely to receive the best bank loans offers. Also young firms mostly lack of experience and a proven track record, in order to improve their chances of receiving a bank loan, they must come up with better business plans.

Firms that are active in the industry, trade and services sector all have a higher probability of receiving a bank loan compared with firms from the construction sector. For policy makers this result could indicate that in the construction sector there are uncertainties that need to be legally addressed, or that there is a need to make policy changes within the construction sector. This can increase the chances of receiving loans in the construction sectors, in which liquidity is very important for future investments.

Firm that did well over the past 6 months or performed consistently had a higher probability of receiving a bank loan compared with firms who had a decrease in profit. Policy makers should try to regulate an easier way for poor performing firms to receive a bank loan (on more strictly terms). These firms are mostly in need of a bank loan, which can help the survival rate of these firms.

Another sub question that this research could shed some light on is: what are the causes of the country differences in the first model? The second regression model with the country specific factors could explain the causes between the country differences. This model was used to distinguish between and measure the countries specific factors. The variable of the bank concentrations was also added to this model to link the banks with the country differences.

The GDP per capita influences the chances of receiving bank loans positively. For policy makers and the European commission this result could be very interesting. Firms that are established in countries that have a higher GDP per capita receive a bank loan faster, which can help strengthen the economy. The higher the chances of receiving a loan the more investments are made, which can help the economy grow. Policy makers can aim for a policy which aims for a higher GDP per capita to improve the chances of receiving bank loans and consequently to improve the economy.

The interest rate in a country is closely associated with inflation. But high interest rates can influence the probability of receiving a bank loan positively. Policy makers and the European commission should take this into consideration. A higher interest rate will trigger

more approval of bank loans, but it could cause the downfall of most firms. This will not help the economy at all, the best course is to leave the banks to set the interest rate, but the European commission should keep an eye on this to make sure that bank do not abuse this power.

The first research question can now be addressed and answered with the help of the first and second regressions. Both firm and country specific factors can determine the chances of receiving bank loans. More specifically, from the 5 firm specific factors, four prove to be significant and positive influences on the probability of receiving bank loans. Only the owner structure did not have an effect on the likelihood of receiving bank loans. Moreover, out of the 5 country specific variables, three proved to be significant and made an influence on the chances of receiving a bank loan. Only the concentration ratio and GDP growth did not have an effect on the chances of receiving a bank loan.

The second research question can be addressed and answered with the first regression. The result indicate that the probability of receiving a bank loan in the Netherlands was lower than 5 out of 30 countries, which means that the Netherlands is not the best country to vessel in for the highest receiving rate of bank loans. In the five other countries (Belgium, France, Luxembourg, Austria and Slovenia) firms could take an advantage of a better chance of receiving a bank loan.

## 5.1 Limitation and suggestions

This research was conducted as the current of the economic crisis began. The variables that this research captures are mostly influenced by the crisis, which produces results that can be very of use for policy makers and European commission, if ever a crisis occurs again.

There are several limitations in this research. First, this research is only focused on countries in Europe. The United States should be added to the results as a benchmarked country, because the crisis started in the US. Second, this study did not capture all the variables that could be influence to the applications of bank loans and the chances of receiving bank loans. Due to the limited availability of data on innovation, this factor could not be used in the regression. Innovation is an essential condition of economic progress and policymakers rarely understate the results of innovations (Freel, 2000). Innovation can affect the receiving rate of bank loans positively. Human capital can also play an important role in obtaining a loan for a new firm (Davidsson, 2003). Human capital measured in formal education can play a positive role in the chances of receiving a bank loan. Future research can also try to add variables that are relevant to the economic climate of the times and subtract the ones that are no longer influential.

One possible line of future research could be to conduct this research on this topic before and after the economic crisis to see what kind of effect the crisis can have on the chances of receiving a bank loan. One can investigate whether the likelihood of receiving bank loans for the firm- and country-specific variables changed a great deal, but also to see whether the probability of receiving bank loans in other European countries changes in comparison with the Netherlands. Also this research can be applied to other countries with the same economic zone, or investigate the chances of receiving bank loans in upcoming economies such as the African union, Arab league or Asia. The results from a research conducted before and after the crisis will be most likely very different than the result of this research. If there were no economic crisis, then this most likely would not affect the variables and the results as they do now. Bank would be more open to loans, and the chances of receiving loans would be way higher. In addition, if one were to analyze the economy after the crisis the chances of receiving a bank loan will most likely be different and affected by different factors. Therefore, if the United States were added to the research then it would show a certain difference before and after the crisis. Before the crises, a loan was easily

attained and all this causes the current crisis and during and after the crisis it is expected to have a lower chance of receiving a bank loan.

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## 7. Annex

**Table 1.** The variables that are used in this research with their corresponding definitions and reference category.

| Variable Notations | Definitions |
|---|---|
| *Dependent variable* | |
| **Received bank loans (recloan1)** | The number of received bank loans over all the 30 countries. With value 1 = Received full requested bank loan and value 0 = did not received a full bank loan |
| ***(Firm level) Independent variables*** | |
| **Size of a firm (Dsize), Measured in employees** | Indicator of the level of firm sizes, measured in employees from: 1-9 (micro firms), 10-49 (Small firms), 50-250 (medium firms) and 250+ (large firms). Reference category : 1-9 |
| **Age of a firms (age), Measured from year of establishment, with base year 2008** | Indicator of the level of firm age, range from: >2, 2-5, 5-10 and 10+. Reference category: >2 |
| **Sector in which a firm is active (Dsector)** | Dummy variable, With four sectors: 1. Industry, 2.construction, 3.trade and 4.services. Reference category:2.Construction |
| **Owner structure of a firm (Downer)** | Dummy variable, with four different owner structures: 1.One owner who is female, 2.one owner who is male, 3.families or entrepreneur and 4. Others Reference category: 1. Owner is female |
| **Income generator (profit)** | Dummy variable: 1. Increase in profit, 2.Profit remains unchanged and 3. Profit decreases. Reference category: 3. Profit decreases |
| ***(Country level) Control variables*** | |
| **Countries (countid)** | Consist of all 30 countries Reference category: 17.Netherlands |
| **GDP (gdp)** | Consist of the GDP per capita of each country |
| **GDP growth (gdpchange)** | Comparison between the GDP per capita of the year 2008 and 2009 for each country |
| **Inflation (inflation)** | Consist of the inflation of each country Measured with the GDP, Deflator (index) |
| **Interest rate (interest)** | Consist of the interest rates for each country from June 2009 |
| **Herfindalh index (concentration)** | Consist of the bank concentration ratio per country |

**Table 2.** The summary of the variables. (Part 1)

| **Variables** | |
|---|---|
| | Percentage |
| Received bank loan (recloan1) | |
| **Applied and got everything** | 64.37 |
| **Applied but only got part of it** | 18.69 |
| **Applied but refused because cost too hi** | 3.96 |
| **Applied but was rejected** | 12.98 |
| | |
| Company size (Employees) | |
| **1-9 (1)** | 32.96 |
| **10-49 (2)** | 34.35 |
| **50-249 (3)** | 22.91 |
| **250+ (4)** | 9.78 |
| | |
| Firm establishment | |
| **0-2 years (2008-2009) (1)** | 3.66 |
| **2-5 years (2004 - 2007) (2)** | 12.51 |
| **5-10 years (1999-2003) (3)** | 16.27 |
| **+10 years (before 1998) (4)** | 67.56 |
| | |
| Enterprise sector | |
| **Industry (1)** | 24.77 |
| **Construction (2)** | 14.26 |
| **Trade (3)** | 25.90 |
| **Services (4)** | 35.07 |
| | |
| Ownership structure | |
| **Families or entrepreneur (1)** | 52.03 |
| **One owner male (2)** | 18.73 |
| **One owner female (3)** | 3.15 |
| **Other structures (4)** | 26.09 |
| | |
| Profit | |
| **Increased (1)** | 16.22 |
| **Remained unchanged (2)** | 21.73 |
| **Decreased (3)** | 62.05 |
| | |
| | Values range |
| **GDP** | 7502,9 - 94417,7 |
| **GDP Growth** | 5,6% - 30,5% |
| **Inflation** | 5% - 414% |
| **Interest** | 3,45% - 12,75% |
| **Concentration ratio** | 206 - 3120 |

Source: The Flash Eurobarometer # 271, International Monetary Fund and the European Central Bank.

**Table 2:** The summary of the variable (Country ID). (Part 2)

| The participating countries and the rank numbers with the percentage of data | | | |
|---|---|---|---|
| | Countid | Percentage | (absolute values) |
| 1. | **Belgium** | 2.21 | 43 |
| 2. | **Czech republic** | 1.75 | 34 |
| 3. | **Denmark** | 1.18 | 23 |
| 4. | **Germany** | 11.43 | 222 |
| 5. | **Estonia** | 0.93 | 18 |
| 6. | **Greece** | 3.45 | 67 |
| 7. | **Spain** | 18.18 | 353 |
| 8. | **France** | 11.07 | 215 |
| 9. | **Ireland** | 0.62 | 12 |
| 10. | **Italy** | 15.45 | 300 |
| 11 | **Rep. Of Cyprus** | 1.49 | 29 |
| 12 | **Latvia** | 0.46 | 9 |
| 13 | **Lithuania** | 1.03 | 20 |
| 14 | **Luxembourg** | 0.82 | 16 |
| 15 | **Hungary** | 1.29 | 25 |
| 16 | **Malta** | 0.77 | 15 |
| 17 | **Netherlands** | 2.37 | 46 |
| 18 | **Austria** | 1.96 | 38 |
| 19 | **Poland** | 5.82 | 113 |
| 20 | **Portugal** | 3.45 | 67 |
| 21 | **Slovenia** | 2.11 | 41 |
| 22 | **Slovakia** | 1.24 | 24 |
| 23 | **Finland** | 0.46 | 9 |
| 24 | **Sweden** | 1.70 | 33 |
| 25 | **UK** | 3.19 | 62 |
| 26 | **Bulgaria** | 1.18 | 23 |
| 27 | **Romania** | 0.72 | 14 |
| 28 | **Croatia** | 2.27 | 44 |
| 31 | **Iceland** | 0.67 | 13 |
| 33 | **Norway** | 0.72 | 14 |

Source: The Flash Eurobarometer # 271.

**Table 3.** Correlation matrix.

| | recloan1 | dsize | age | dsector | downer | profit | gdp | gdpchange | inflation | interest | concen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **recloan1** | 1 | | | | | | | | | | |
| **dsize** | 0.084 | 1 | | | | | | | | | |
| **age** | 0.066 | 0.251 | 1 | | | | | | | | |
| **dsector** | -0.039 | -0.218 | -0.150 | 1 | | | | | | | |
| **downer** | -0.006 | 0.152 | -0.016 | 0.046 | 1 | | | | | | |
| **profit** | -0.103 | 0.027 | 0.111 | -0.047 | -0.008 | 1 | | | | | |
| **gdp** | 0.113 | -0.030 | -0.069 | -0.005 | -0.073 | -0.110 | 1 | | | | |
| **gdpchange** | 0.097 | 0.029 | 0.048 | -0.056 | -0.098 | -0.043 | 0.339 | 1 | | | |
| **inflation** | -0.141 | 0.029 | -0.021 | 0.029 | 0.086 | 0.107 | -0.430 | -0.318 | 1 | | |
| **interest** | -0.081 | 0.028 | 0.006 | 0.004 | 0.113 | 0.066 | -0.636 | -0.552 | 0.615 | 1 | |
| **concentrat** | -0.025 | -0.025 | 0.009 | 0.013 | 0.037 | 0.022 | -0.200 | -0.250 | 0.083 | 0.302 | 1 |

Source: The Flash Eurobarometer # 271, International Monetary Fund and the European Central Bank.

**Table 4.** Result of the analysis: Coefficients and standard errors for each variable corresponding to the logit regression and the marginal effect. (Part 1)

Model 1 : Firm-specific variables plus all the countries

| | **Logit regression** | | **Marginal effect** | |
|---|---|---|---|---|
| | **Coef.** | **Std. Err** | **dy/dx** | **Std. Err.** |
| **Dsize** | Ref:(1-9) | | | |
| 2. (10-49) | .204 | .131 | .043 | .027 |
| 3. (50-250) | .394*** | .152 | .081*** | .031 |
| 4. (250+) | .361* | .205 | .074* | .041 |
| **Age** | Ref:(>2) | | | |
| 2. (2-5) | .201 | .326 | .044 | .071 |
| 3. (5-10) | .335 | .325 | .072 | .071 |
| 4. (10+) | .570* | .309 | .121* | .067 |
| **Dsector** | Ref:(Construction) | | | |
| 1. (Industry) | .326* | .173 | .069* | .036 |
| 3. (Trade) | .425** | .170 | .089** | .035 |
| 4. (Services) | .305* | .157 | .064* | .033 |
| **Downer** | Ref:(Female) | | | |
| 2.(Male owner) | -.104 | .146 | -.021 | .030 |
| 3. (Fam/Entr) | -.280 | .304 | -.059 | .065 |
| 4. (Other) | .105 | .129 | .021 | .026 |
| **Profit** | Ref:(Decrease) | | | |
| 1. (Increase) | .299** | .149 | .061** | .030 |
| 2. (Unchanged) | .399*** | .135 | .081*** | .026 |

Source: The Flash Eurobarometer # 271, International Monetary Fund and the European Central Bank. The first model consist of the firm-specific variable including all the thirty countries, which is used to interpreted the results with the marginal effect coefficient and standard errors.

*** Denotes significance at 1%, ** denotes significance at 5% and * denotes significance at 10%

**Table 4.** Result of the analysis: Coefficients and standard errors for each variable corresponding to the logit regression and the marginal effect. (Part 2)

Model 1: Firm-specific variables plus all the countries

| | **Logit regression** | | **Marginal effect** | |
|---|---|---|---|---|
| **countid** | **Coef.** | **Std. Err.** | **dy/dx** | **Std. Err.** |
| 1.Belgium | 1.095** | .539 | .213** | .096 |
| 2.Czech republic | .001 | .472 | .0002 | .110 |
| 3.Denmark | -.046 | .570 | -.010 | .133 |
| 4.Germany | .531 | .340 | .115 | .077 |
| 5.Estonia | -.307 | .551 | -.073 | .132 |
| 6.Greece | -.723* | .396 | -.174* | .093 |
| 7.Spain | -.616* | .321 | -.148* | .075 |
| 8.France | 1.248*** | .360 | .235*** | .075 |
| 9.Ireland | .873 | .716 | .178 | .130 |
| 10.Italy | .541 | .330 | .117 | .075 |
| 11.Rep. of Cyprus | .684 | .559 | .145 | .112 |
| 12.Latvia | -.588 | .787 | -.141 | .189 |
| 13.lituania | -.121 | .566 | -.028 | .134 |
| 14.Luxembourg | 1.419* | .816 | .257* | .115 |
| 15.Hunagry | .399 | .534 | .088 | .115 |
| 16.Malta | .346 | .594 | .077 | .129 |
| 18.Austria | .986** | .487 | .196** | .092 |
| 19.Poland | .073 | .366 | .016 | .085 |
| 20.Portugal | -.030 | .398 | -.007 | .093 |
| 21.Slovenia | 1.046** | .523 | .206** | .096 |
| 22.Slovakia | .659 | .585 | .140 | .117 |
| 23.Finland | .890 | .879 | .181 | .154 |
| 24.Sweden | .354 | .483 | .079 | .106 |
| 25.Uk | .060 | .409 | .014 | .094 |
| 26.Bulgaria | -.481 | .534 | -.115 | .128 |
| 27.Romania | -.044 | .628 | -.010 | .147 |
| 28.Croatia | -.538 | .442 | -.129 | .105 |
| 31.Iceland | -.003 | .731 | -.0007 | .170 |
| 33.Norway | -.856 | .664 | -.205 | .154 |

Source: The Flash Eurobarometer # 271, International Monetary Fund and the European Central Bank. The first model consist of the firm-specific variable including all the thirty countries, which is used to interpreted the results with the marginal effect coefficient and standard errors.

*** Denotes significance at 1%, ** denotes significance at 5% and * denotes significance at 10%

**Table 5.** Result of the analysis: Coefficients and standard errors for each variable corresponding to the logit regression and the marginal effect.

Model 2: Firm specific variables plus the Country specific variables

| | Logit regression | | Marginal effect | |
|---|---|---|---|---|
| | Coef. | Std. Err. | Dy/Dx | Std. Err. |
| **Dsize** | Ref:(1-9) | | | |
| 2. (10-49) | .239* | .128 | .053* | .028 |
| 3. (50-250) | .415*** | .148 | .090*** | .031 |
| 4 (250+) | .402** | .201 | .087** | .042 |
| **Age** | Ref:(>2) | | | |
| 2. (2-5) | -.242 | .309 | -.054 | .068 |
| 3. (5-10) | -.159 | .304 | -.035 | .067 |
| 4. (10+) | .134 | .288 | .028 | .063 |
| **Dsector** | Ref:(Construction) | | | |
| 1. (Industry) | .419** | .167 | .093** | .037 |
| 3. (Trade) | .470*** | .166 | .103*** | .036 |
| 4. (Service) | .234 | .152 | .053 | .034 |
| **Downer** | Ref:(Female) | | | |
| 2. (Male owner) | -.017 | .140 | -.003 | .030 |
| 3. (Fam/Entr) | -.135 | .289 | -.029 | .064 |
| 4. (Other) | .030 | .125 | .006 | .026 |
| **Profit** | Ref:(Decrease) | | | |
| 1. (Increase) | .458*** | .147 | .098*** | .030 |
| 2. (Unchanged) | .478*** | .132 | .102*** | .027 |
| **GDP** | .021*** | .006 | .004*** | .001 |
| **GDPchange** | 1.193 | 1.136 | .257 | .245 |
| **Inflation** | -.005*** | .001 | -.001*** | .000 |
| **Interest** | .114** | .051 | .024** | .011 |
| **Concentration** | -.086 | .122 | -.018 | .026 |

Source: The Flash Eurobarometer # 271, International Monetary Fund and the European Central Bank. The Second model consist of the firm specific variable including all the country specific variables, which is used to interpreted the results with the marginal effect coefficient and standard errors.

*** Denotes significance at 1%, ** denotes significance at 5% and * denotes significance at 10%