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Faculteit Bedrijfseconomische Wetenschappen

master in de toegepaste economische wetenschappen: handelsingenieur

Masterthesis

Factors influencing the loan approval to Belgian SMEs

Giel Lijnen
Michiel Schrijvers

Scriptie ingediend tot het behalen van de graad van master in de toegepaste economische wetenschappen: handelsingenieur, afstudeerrichting accountancy en financiering

PROMOTOR :

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Abstract

The purpose of this paper is to provide new insight in the determinants used by Belgian commercial banks to evaluate loan applications of Belgian small- and medium-sized enterprises (SMEs). Based on an experiment with a sample of 70 loan officers, the results suggest that Belgian loan officers put high importance on the company's own share of investment, repayment capacity, solvency and antecedents history. Moreover, conjoint analysis reveals that almost half of a loan officer's credit decision is based on the borrower's repayment capacity and its history of antecedents. In addition, more than sixty percent of a loan officer's credit decision is based on quantitative information about the borrower. In general, this study has revealed that the credit decision process of Belgian banks is very conservative. Furthermore, the study has revealed that Belgian loan officers still heavily rely on the assessment of quantitative data that is based on historical information of the credit-demanding SME when making their credit decision.

1. Introduction

In many firms a large part of the capital structure is composed of debt (Hernández-Cánovas & Koëter-Kant, 2008). Most of this debt arises from loans granted by financial institutions to the firm. Private firms, as well as listed companies, rely heavily on these bank loans to finance their business activities. For private companies, debt financing is often of crucial importance for the survival and the development of the company (Miñarro-Gómez, Hernández-Cánovas, & Martínez-Solano, 2016). This is due to the fact that, compared to listed firms, private firms are limited in their ability to attract new equity from public markets. Most of the companies in need of financing are not yet profitable enough to be self-sufficient and the entrepreneur might be unwilling to share his ownership with other investors (Berger & Udell, 1998). Yet, it is also usually impossible for the entrepreneur to provide all the funds the company needs to operate by himself, thus creating the need for external financing. In this case lending from a bank seems an attractive option (Volker, Holland, Shepherd, & Wiklund, 2008).

Most private firms can be comprised within the category of 'small- and medium-sized enterprises' (SME)¹. Despite their great need, SMEs generally experience difficulties obtaining loans (Moro & Fink, 2013; Volker et al., 2008). This can be explained by the findings that these companies are not obligated to disclose extensive financial statements, often are too young to be able to present extensive historical performances and usually lack the presence of efficient control systems (DeZoort, Wilkins, & Justice, 2017; Volker et al., 2008). Additionally, most private companies are 'owner managed' firms, which tend

¹ Belgian law defines a SME as a company which did not exceed more than one of the following three criteria on ending date of the last financial year; (1) balance sheet total: maximum 4 500 000 EUR; (2) annual revenue: maximum 9 000 000 EUR; (3) annual average workforce: maximum 50 full-time equivalents.

to be less transparent than publicly traded firms (Volker et al., 2008). All these findings result in a lack of credible information from small firms. This lack of information makes it difficult for loan officers to found their decision on a credit application. The asymmetry in information about the firm between the borrower and the lender can be exploited by entrepreneurs, leading to the infamous adverse selection and moral hazard problems (Banerji & Basu, 2015; Berndt & Gupta, 2009; Volker et al., 2008), which further complicate the loan officer's credit decision.

When handling a loan application, a loan officer usually searches for information about the applicant to determine the risk that the loan will not be repaid, which will lead to a loss for the bank (Volker et al., 2008). The higher the banker estimates this risk, the less interesting the conditions of the loan for the applicant will be, through the use of a higher interest rate. When the risk is considered too high, the credit application will be rejected and the applicant will be left empty handed. Due to the lack of credible information, it is often a difficult task for the loan officer to determine the risk of lending to a company, making it difficult to distinguish the high-risk borrowers from the low-risk borrowers (Volker et al., 2008).

As a result of the financial crisis of 2008 – and the worldwide recession that followed – the financial sector was placed under tight supervision and subjected to stricter regulations prescribed by the Third Basel Accord (Basel III) (Saha, Bose, & Mahanti, 2016). Basel III prescribes stricter rules on solvency and liquidity for the banking sector with the objective to decrease the vulnerability of this sector to financial and economic shocks (Isépy, 2015). One of the consequences of this accord was a decline in credit availability, especially from small banks, due to difficulties in meeting the new minimal capital requirements banks faced (Padgett, 2013). This decline in credit availability will mainly affect smaller, private companies which often rely heavily on bank lending as a source of financing (Volker et al., 2008).

Numerous previous studies already found bank loans to be the most important source of external financing for SMEs (Volker et al., 2008). For private companies, who don't have access to public capital markets, their existence and development often depends on their ability to borrow funds from banks. Therefore, it is very interesting for these companies to know how banks process credit applications and which factors are most important in determining risk. This information could be useful for SMEs when applying for credit because it might increase their chances of loan approval.

The purpose of this study is to determine the most important credit decision criteria on which Belgian loan officers² base their assessment of a credit application from a Belgian SME. This information can be very useful for managers of SMEs trying to obtain a bank loan. Understanding the main credit decision criteria could enable a SME to obtain credit more easily because the company clearly knows to what loan officers will pay attention to when assessing its credit application. With the knowledge about the most important credit decision criteria, the credit demanding SME can better approach loan officers by providing them the information they consider important. A SME thus might be able to increase its chance of credit approval. The understanding of the main credit decision criteria could therefore allow more

² A loan officer working at a commercial bank in Belgium is considered a Belgian loan officer regardless of the loan officers true nationality

Belgian SMEs to experience less difficulties with their credit application, resulting in more SMEs applying for credit and more credit applications that might be approved because applying SMEs can provide the loan officer the right information. A higher chance of credit approval is not only positive for the credit demanding SMEs, it is also beneficial to the Belgian economy and society. As more SMEs have access to credit, more SMEs can request commercial bank loans for the financing of their investment and expansion activities. This will result in better financial results, more employment, increased efficiency, more added value creation and a higher living standard of the Belgian population.

To identify the most important credit decision criteria, relevant scientific literature was first examined to get an overview of the factors that could have the largest influence on a loan officer's credit decision. Then, interviews were carried out with three loan officers – each of them being the head of the corporate credit department – to test the relevance of these factors on the credit decision of Belgian loan officers and to identify possible other important factors to Belgian loan officers when assessing a credit application of a SME. Based on the interview results and literature, five factors were found that tend to be of great importance to Belgian loan officers. These factors are: repayment capacity, antecedents history, own share of investment, solvency and CEO's experience. On a sixth factor, family ownership, there was great disagreement in literature as well as between the interviewed loan officers whether or not this factor has a significant influence on the credit decision. Next, the importance of these six factors on a credit decision was tested by sending out a scenario-based questionnaire to several loan officers, each of them being employed with one of the four largest Belgian banks. Seventy loan officers were asked to evaluate the chance that they would grant credit to a fictional Belgian SME under eight different scenarios. Each scenario consisted of the six identified factors. The combinations of the attributes given to these six factors were different in each scenario to allow to conduct a conjoint analysis on the loan officers' answers to test the importance of each of the six factors on a loan officer's credit decision. After the conjoint analysis, an OLS regression was carried out to test the economical and statistical relevance of the six examined factors. Results from both the conjoint analysis and the OLS regression suggest that Belgian loan officers base their credit decision for almost fifty percent on a SME's repayment capacity and antecedents history and that 41% of the variation in the loan officer's chance of credit approval can be explained by the six examined factors.

This study is organized as follows. Section 2 identifies the major factors that influence the credit decision. First, loan officers' credit decision criteria discussed in scientific literature will be reviewed. Second, the credit decision criteria mentioned by the three interviewed Belgian loan officers will be discussed. Finally, an overview will be given of all factors cited in scientific literature and from the interviews. The most important common factors will be emphasized and hypotheses about their order of importance and impact on the credit decision will be stated. Section 3 interprets the results of the empirical study which consists of a conjoint analysis and ordinary least square (OLS) regression in order to test the hypotheses made in section 2. In section 4, results are discussed and interpreted. Deviations from expectations are explained as well as possible implications of the found results. Section 5 highlights the research

limitations and the possible suggestions for further research. The study ends with a general conclusion about the results found.

2. Identification of major credit decision criteria

In Belgium, and the rest of the European Union, SMEs play an important role in the economy (Kachlami & Yazdanfar, 2016; Kiser, Prager, & Scott, 2016; Roman, 2011; Song & Hung, 2018). In 2015, almost all Belgian businesses (99.8%) were SMEs. These SMEs were responsible for 69.9% of total employment and together created 124.1 billion euro in added value, accounting for 62.6% of the total added value in Belgium (European Commission, 2016). It is therefore important for both the Belgian economy and its society that SMEs get every opportunity to develop and grow. However, this is not self-evident. To develop and grow, a company needs financing.

Businesses can rely on different financing methods according to the purpose of the financing. Start-ups, for example, can rely on private equity in the form of venture capital and angel investment. These types of private equity disappear as the company stops growing rapidly and becomes more mature (Metrick & Yasuda, 2011). More mature companies, therefore, have to look for other financing methods. When deciding which source of funding to use, companies take into account a pecking order (Myers & Majluf, 1984). This pecking order suggests that companies prefer cheaper financing methods over more expensive alternatives. In first instance, companies will rely on internal financing sources such as free cash flow from operations or personal contribution in the form of equity. Internal financing sources are, however, usually not sufficient enough to support total development and growth (Canales & Nanda, 2012). Therefore, companies have to look for external financing. For external financing, SMEs are often dependent on private debt and equity markets because most SMEs are privately held and do not have access to public markets (Berger & Udell, 1998). The majority of SMEs prefer debt over equity. Not only because of the lower cost of debt but also because many of these SMEs are owner-managed. These owner-managed SMEs try to avoid the use of private equity to preserve their ownership stake in the company (Volker & Margaret, 2008). Therefore, SMEs rely heavily on private debt. The most common form of private debt are loans offered by commercial banks.

Although these funds are in theory available to SMEs, it is often difficult for SMEs to obtain such commercial bank loans for two reasons. Firstly, commercial banks often deny the credit request of SMEs because of the SME's informational opacity. SMEs are less regulated than large, publicly listed companies and therefore do not have to make their financial statements and other firm specific information publicly available. The lack of useful information makes due diligence more difficult, causing commercial banks to refuse credit to SMEs (Berger & Udell, 1998). A second reason for the limited access SMEs have to commercial bank loans arises from the banking industry itself. The financial sector is one of the most regulated industries in the world (Kale, Eken, & Selimler, 2015; Mileris, 2012). Regulations within the financial sector have become even more severe over the past years as a result of the credit crisis of 2008 (Rötheli, 2010). An important change in regulations after the financial crisis was the introduction

of Basel III to strengthen the bank's capital requirements (Rashiti, Kalas, Drec, & Stameski, 2016). This stricter regulation aims to limit the risks banks take, by increasing their solvency and liquidity requirements. One of the main risks faced by commercial banks is credit risk. Credit risk is the risk that a borrower cannot repay the loan amount and interest payments (Mileris, 2012). It is linked to the concept of expected loss, which is the total amount at risk for a bank when granting credit to a company. The expected loss is calculated as the borrower's probability of default multiplied by the loss given default – the part of the loan that cannot be recovered when the borrower defaults (Huang, Ye, Ho, & Kao, 2016). To limit their credit risk and the corresponding expected loss associated with SME loans, a bank generally collects and analyses both quantitative and qualitative information about the SME that applies for credit (Haralambie & Lonescu, 2016). However, collecting useful information is not easy due to the SME's information opacity mentioned earlier. This information opacity can make the existence of information asymmetry possible (Cenni, Monferrà, Salotti, Sangiorgi, & Torluccio, 2015). The borrower can misuse this information asymmetry to its own advantage, which might lead to the well-known moral hazard and adverse selection problems (Behr, Entzian, & Güttler, 2011; Berger & Udell, 1998). Therefore, assessing the perceived credit risk can be difficult for a bank. Nevertheless, it is of crucial importance for the estimation of the expected profitability of a bank's credit engagement. A well-established credit decision process is thus important for the existence of commercial banks because it reduces risk and uncertainty in managing loans to SMEs (Volker et al., 2008).

Next, the most important credit decision criteria mentioned in relevant scientific literature are summarized. Subsequently, the results of the interviews with three Belgian loan officers are presented. From these interview results and the literature study, several factors are identified which are believed to have the greatest influence on the credit decision of a loan officer.

2.1. Literature review

Throughout the years there has been an abundance of research indicating factors which might influence a bank's credit decision process. The most recurrent quantitative and qualitative factors found in academic papers are discussed in the following sections. Each identified factor will be briefly introduced and their effect on the credit application decision will be examined.

2.1.1. Quantitative factors influencing the credit decision process mentioned in scientific literature

When analysing quantitative information, literature suggests that factors like past performance (Volker et al., 2008), share of investment (Ottavia, Chuluunbaatar, Shiann-Far, & Ding-Bang, 2011; Volker et al., 2008), financial position (Lepley, 1998; Volker et al., 2008), collateral (Berger & Udell, 1998; Chakraborty & Hu, 2006; Ottavia et al., 2011; Steijvers & Voordeckers, 2009; Volker et al., 2008; Yaldiz Hanedar, Broccardo, & Bazzana, 2014) and firm size (Lee, Sameen, & Cowling, 2015; Ottavia et al., 2011) play an important role in the credit application process.

One of the most cited factors when assessing a credit application according to previous research is the **past performance** of the firm applying for a loan. The performance of a firm is an important factor in

estimating its ability to repay the loan (Gibson, 1993). It also reflects competence of the firm in its business sector (Volker et al., 2008). Measures for past performance can be found in accounting information like generated profits and losses or several financial ratios derived from this financial information. The information on past financial performance allows banks to assess the creditworthiness of a particular firm (Volker et al., 2008). A poor past financial performance might indicate shortcomings in management or other areas which in turn might raise questions about the new investment project. On the other hand, a successful past shows overall competence of the firm and its management. It indicates that the firm has the competence to successfully execute the new project (Volker et al., 2008). Therefore, it is expected that SMEs with better past financial performances have less difficulties obtaining loans.

Another quantitative factor discussed in previous research is the **financial position** of the firm. The financial position of a firm is closely related to its past performance. Even though the two factors are closely related, the financial position of a borrower influences the credit decision differently than past performance. The financial position indicates if the firm is financially solid enough to repay the loan in case the investment should fail (Volker et al., 2008). Firms with a strong financial position give a signal to the bank that they will be able to repay the loan irrespective of the outcome of the investment. A common measure used when analysing a firm's financial position is the solvency of the company. Solvency indicates the ability of the firm to meet its long-term financial obligations. Solvency can be represented by the ratio of equity to total assets, where a higher value for this ratio usually indicates a stronger financial position. When analysing the financial position of a firm, attention is also given to the liquidity of the firm. The liquidity indicates the ability of the firm to meet its short-term obligations. Due to the lower perceived risk for firms with a stronger financial position, it is expected that firms with a stronger financial position experience less difficulties obtaining loans.

The **share of the investment** which the SME finances with its own funds also plays an important role in the credit decision process. In funding a new investment, SMEs usually are required to finance part of the investment themselves by equity to ensure that the company will act in the investor's best interest (Ottavia et al., 2011; Volker et al., 2008). If the whole project would be financed by a loan – without the firm also paying part of the investment – all risks associated with the investment are shifted towards the bank. It creates an incentive for the firm's managers to engage in risky investments as they do not bear much of the risk associated with these investments. The SME has an unlimited upside potential while the upside potential for the bank is limited as they only gain the principal and interests payments when the investment is successful. A bigger share of the investment paid by the company itself aligns interests of lender and borrower and decreases chances of opportunistic behaviour. In addition, the firm's willingness to finance a larger part of the investment by equity is perceived as a positive signal by banks (Bruns, 2004; Volker et al., 2008). It indicates that management strongly believes in the success of the project and is willing to risk personal or internally generated funds. When the firm finances a larger part of the investment through internally generated funds, the required amount of external funding decreases. As a result, the bank's expected loss will decrease which in turn decreases the bank's credit

risk (van Vuuren, de Jongh, & Verster, 2017; Volker et al., 2008). Based on these arguments, it is believed that the larger the company's own share in the investment, the higher the chance of credit approval.

Another factor of importance for the credit decision process and to which is referred to several times in scientific literature, is collateral. If the borrower defaults, the lender often is unable to recover the full amount of the loan. This results in a loss for the bank. Previous research showed that a bank can limit its risk from a default loss by the borrower by requesting **collateral**. Requesting collateral allows the bank to liquidate assets of the borrower if the latter defaults, creating an alternative source of repayment (Ottavia et al., 2011; Volker et al., 2008). In general, there are two types of collateral (Gavalas & Syriopoulos, 2015). On the one hand, banks can require inside collateral. Inside collateral refers to collateral on assets of the company itself. These can be assets that already existed before the investment or a collateral pledge on assets created through the project for which the firm searches credit. On the other hand, banks can require outside collateral as well. Outside collateral refers to a collateral pledge on assets that do not belong to the company. These are, for example, private assets of the company's owner or his family (Cooper & Frédéric, 2014). These personal guarantees and collateral ensure that the borrower is committed to the company and reduce the probability of opportunistic behaviour as the owner-manager is putting personal funds at risk (Blazy & Weill, 2013; Jiménez & Saurina, 2004; La Porta, López-De-Silanes, & Zamarripa, 2003). Banks especially value collateral that is independent of the project's or firm's success, such as shares in other firms and private property, as there often is less uncertainty regarding their value (Volker et al., 2008). Banks require higher collateral from borrowers with higher credit risk. The collateral acts as a 'safety net' and may reduce the bank's risk exposure and provides an incentive to be less careful (Blazy & Weill, 2013; Jiménez & Saurina, 2004; Ottavia et al., 2011). This should lead banks to be less restrictive in lending money to SMEs that provide strong collateral independent of their success. Therefore, scientific literature suggests that companies that possess more valuable collateral have a better chance of receiving the requested credit.

Despite the focus of this study on SME loans, **firm size** is also believed to impact the credit decision process (Lee et al., 2015). Larger firms tend to survive longer, resulting in a lower risk for the bank. Firm size often is measured by sales volume which directly affects the profitability and sustainability of the business (Bercovitz & Mitchell, 2007; Ottavia et al., 2011). As already mentioned, small firms often face more difficulties in obtaining loans than larger firms due to their less comprehensive track record and lack of publicly available information. SMEs also often have less bargaining power than large companies when negotiating a loan (Ottavia et al., 2011). Therefore, it is hypothesized that the size of the firm has a positive effect on the probability of loan approval (Cziráky, Tišma, & Pisarović, 2005).

2.1.2. Qualitative factors influencing the credit decision process mentioned in scientific literature

When it comes to qualitative information, academic research suggests that factors as risk proclivity (Volker et al., 2008), related business experience (Ottavia et al., 2011; Volker et al., 2008), CEO experience (Volker et al., 2008), lender-borrower relationship (Ottavia et al., 2011), family status (D'Aurizio, Oliviero, & Romano, 2015) and loan officer's human capital (Ottavia et al., 2011) also have a significant impact on the credit decision. According to D'Aurizio et al. (2015), the importance of qualitative information in the credit decision process would have strongly increased after the financial crisis of 2008.

One of the most important qualitative factors influencing the willingness of the bank to grant credit, is a company's **risk proclivity**. Despite its importance, it is often very difficult to obtain relevant information concerning the risk proclivity of a privately held firm (Binks, Ennew, & Reed, 1992; Volker et al., 2008). The main reason for this is the existence of an information asymmetry between the bank and the borrower. This information asymmetry might lead to moral hazard situations in which the borrower takes advantage of the information asymmetry to redistribute wealth to itself at the expense of the bank (Binks et al., 1992). The borrower might, for example, use the borrowed amount for other purposes than agreed upon to follow his self-interest. This can lead to a high risk increase for the bank. Therefore, it is important for a bank to ensure that its borrowers do not engage in moral hazard practices (Volker et al., 2008). In addition to this information asymmetry, there is the problem that banks generally are more risk averse while SMEs tend to invest in risky projects. This in turn explains the general finding that SMEs often experience difficulties obtaining loans. Based on these arguments, it is expected that SMEs with a lower risk proclivity have an increased chance of credit approval.

Another major factor influencing the credit decision is the quality of human capital within the SME. One way to evaluate a SME's human capital is through the evaluation of the **related business experience** of the SME. This factor can be measured by the evaluation of the SME's success with past projects (Bruderl & Schussler, 1990; Volker et al., 2008). The success of a company is closely related to its experience. Companies with more experience in their business sector have a higher chance of successfully completing a project within that sector. A SME that has successfully completed a similar project has shown it owns the required competences, knowledge and skills to execute the new project and let the investment pay off. A positive track record of similar projects therefore gives a signal to the bank about the probability of success of the new project. This in turn, influences the likelihood of loan repayment (Sargent & Young, 1991; Scherr, Sugrue, & Ward, 1993; Volker et al., 2008). As firms mature, they obtain skills. These skills increase the chance of sustaining and achieving business success, leading to a more favourable condition for loan approval (Ottavia et al., 2011). Generally, it is stated that SMEs with a higher level of competence within the business project – indicated by related business experience which can be measured by successful similar projects in the past – experience less difficulties obtaining loans.

Another way to evaluate a SME's human capital is by looking at the **experience of the CEO**, which therefore is also indicated as an important factor that influences a loan officer's credit decision. As success with past projects indicates that the firm possesses the required competences, knowledge and skill, so does years of CEO tenure indicate that the CEO possesses the required human capital needed to successfully lead the company. The experience and track record of the CEO are regarded as strong indicators of the company's future performance and its ability to successfully execute a new business project (Volker et al., 2008). A measure of CEO experience often used, is simply the number of years the CEO has been at the head of the company. In addition to the proven competence, knowledge and skills to run a firm, empirical evidence also shows that managers with more experience tend to be more risk averse (Volker et al., 2008; Wiklund, 1998). This implies that companies with more experienced managers tend to invest in projects with a lower risk. The lower the associated risk of an investment, the higher the chance of success. In turn, this leads to a lower risk for the bank. As the bank's risk decreases, loan officers will be more eager to provide the firm's requested credit. The chance on a loan approval thus increases.

The next factor that influences the loan decision making is the **lender-borrower relationship** (Ottavia et al., 2011). A bank can get more information from a client when this client also makes use of other services provided by the bank, such as deposit accounts and treasury transactions. Through the use of different bank services, a company and the bank can create a strong relationship. The information gained from this relationship banking can be used as a reference for future credit relations and creditworthiness (Hernández-Cánovas & Koëter-Kant, 2008; Ottavia et al., 2011). The extra information aids the loan officer in analysing the credit risk associated with the loan. Another interesting finding concerning the lender-borrower relationship is that borrowers are more inclined to apply for a loan with banks they already have a relationship with. So engaging in strong relationship building by the bank results in a higher probability of sealing future loan contracts (Bharath, Dahiya, Saunders, & Srinivasan, 2007). Having a strong relationship with the bank lowers the loan officers' level of screening. This indicates that a bank is willing to take more risk when engaging in a loan with a borrower it already has a relationship with (Jiménez & Saurina, 2004; La Porta et al., 2003; Ottavia et al., 2011). These arguments result in the expectation that a relationship with the bank will have a positive effect on loan approval.

Whether or not the firm is a family firm might also affect the outcome of the loan decision. Academic researchers are divided on the influence of **family ownership** of the firm on the risk of investing in this firm. On the one hand, it is believed that family block-holders attach a value to controlling the firm that is not merely monetary and therefore reducing the incentive for strategic default. This added value can come from the personal status the family acquires thanks to the identification of the family name with the firm or the possibility to pass the firm on to their descendants in the future. Family firms therefore may be perceived as more creditworthy as they have less incentive to default in the future (Anderson, Mansi, & Reeb, 2003; Bandiera, Guiso, Prat, & Sadun, 2015; Burkart, Panunzi, & Shleifer, 2003; D'Aurizio et al., 2015). On the other hand, due to their large share in the ownership of the firm, family owners may have more incentives to extract private benefits at the expense of other investors because most of

the gains from this misbehaviour flow to the single family (D'Aurizio et al., 2015; Lins, Volpin, & Wagner, 2013; Villalonga & Amit, 2006). This behaviour increases the risk the bank faces when lending to a family firm. Determining the precise impact of family ownership on the creditworthiness of a firm therefore is a difficult task. Through careful analysis and personal contact the loan officer will have to determine which incentive will dominate and what its effect on the creditworthiness of the firm will be. The impact of the nature of the business therefore remains ambiguous.

Characteristics of an individual play an important role in every decision making this individual faces, the characteristics of the loan officer therefore will also influence its decision making when analysing a loan application. Therefore, just like the human capital of the borrower influences the decision, so does the **human capital of the lender** (Bruns, Holland, Shepherd, & Wiklund, 2008; Ottavia et al., 2011). Loan officers use their knowledge, skills and experience when evaluating and processing loan applications. Human capital adds value to a firm (Becker, 1994). In a commercial bank loan context, loan officers with a higher level of human capital could give a more accurate analysis on the credit risk, providing better performance to the bank. They possess the knowledge, experience and skills necessary to use different approaches and effective ways to better assess the risks of the borrowers and to give more accurate assessments of the investment projects. They are also better able to take into account more factors of the borrower and the relationship between different factors when analysing a loan application (Dimov & Shepherd, 2005). Although the credit decision process has been evolving to an increasingly uniform process, the human capital of the loan officer is believed to still have an influence on the decision making process, causing decisions over loan applications to vary depending on their human capital (Ottavia et al., 2011). Two different types of human capital can be identified. This classification is made based on the degree of specificity. On the one hand, there is general human capital that provides the individual with all-purpose skills and broad problem-solving capabilities which are useful in multiple different contexts. This type of human capital is believed to be deducted from formal education as an individual with a high level of education is supposed to have a broader base of articulable knowledge, increased communication, problem-solving and social skills (Fisher & Govindarajan, 1992). On the other hand, there is specific human capital which is developed through experience and training on the job and therefore results in skills that are limited in applicability to a specific task (Gimeno, Folta, Cooper, & Woo, 1997).

Following a study by Bruns et al. (2008), human capital of a loan officer can be operationalised by looking at four factors. The first factor concerns the education of the loan officer as a benchmark of general human capital. Loan officers with a higher level of education are considered to have a broader knowledge, increased information processing and problem solving skills making them able to make more effective and faster decisions as well as a larger future learning capacity (Bruns et al., 2008; Forbes, 2005; Ottavia et al., 2011). The second factor comprises the banking experience of the loan officer. Banking experience helps in the development of general as well as specific human capital to the banking industry. Formal training, on-the-job training and experience gives bankers a better understanding of the products, services and processes of the bank. This in turn provides bankers with tacit knowledge on how to

effectively perform particular assignments (Bruns et al., 2008; Ottavia et al., 2011). A third factor used to operationalise the loan officer's human capital concerns the lending experience of the loan officer. Through expertise gained from experience in lending activities, loan officers will develop a higher self-efficacy, different viewpoints and reach different solutions compared to those with a lower level of experience. Expert loan officers are usually more efficient in their decision making due to an increased focus on the factors that mostly affect the outcome of the decision (Bruns et al., 2008; Choo & Trotman, 1991; Ottavia et al., 2011). The final factor deals with the recent exposure to SME loans. Recent exposure to SME lending increases the familiarity with this kind of loans, which in turn reduces the loan officer's risk perception (Bruns et al., 2008; Lipshitz & Strauss, 1997; Ottavia et al., 2011). It also gives more specific tacit knowledge increasing the specific human capital of the loan officer.

In addition to these aforementioned factors, the concept of the *Five Cs of lending (5Cs)* also is often cited. These 5Cs state five factors which traditionally were assumed to be of most importance in loan decision making, comprising most of the factors mentioned above. The 5Cs consist of the following factors: character, which relates to the characteristics of the borrower, its reputation, quality, integrity, stability and willingness to repay the loan; capacity reflecting the borrower's financial condition and skills and knowledge in the industry; capital relating to the borrower's assets, money invested in the operation of the firm and the firm's survival prospects; collateral pledged as a guarantee for the loan; and conditions relating to macro and micro economic conditions in which the firm operates (Bruns et al., 2008; Lepley, 1998; Ottavia et al., 2011). Traditionally these factors were believed to be of most importance when analysing a loan application. However, recent research as well as the interviews carried out in this study, indicate that loan decision making nowadays focuses on a much wider scope of factors.

Next, the results of the interviews with three Belgian loan officers on the credit decision criteria that are important to them are presented and discussed.

2.2. Interview results

In 2016, there were ninety different banks operating in Belgium. These banks showed a joint balance sheet total of 1.345 trillion euro that year. Despite the large number of different banks based in Belgium, the market is dominated by four major players. These four banks each have an individual balance sheet total of over 100 billion euro and had a combined market share of 71.13% in 2016 (Febelfin, 2016). These four banks each are active in the field of lending to SMEs. Given their large representation within the Belgian banking sector, these four banks were exclusively asked to participate in an interview about their credit decision process. Of these four banks, three have cooperated in the interview. One bank refused their cooperation because it was in conflict with their internal policies. At each of the three participating banks, one loan officer was interviewed. Each interviewed loan officer is the head of the corporate credit department and is experienced in lending to SMEs. The interviewed loan officers have on average twenty-one years of corporate lending experience, twenty-seven years of banking experience and they each handle around 200 credit applications of SMEs every year. Their experience, knowledge and expertise on lending to SMEs is an important added value to this research. The interviewed loan

officers preferred to remain anonymous and had asked not to mention their bank's name in the interview results.

During the interview, the loan officers were asked which factors are important to their bank when assessing a credit application of a SME. The results of the survey largely confirmed the factors described in academic research but also revealed new insights. The loan officers confirmed that banks rely on both quantitative and qualitative data of the company when assessing its credit application. Both types of data contain important information to correctly assess the risk profile of that company.

2.2.1. Quantitative factors mentioned by the interviewed loan officers

According to the three interviewed loan officers, one of the most important quantitative factors to assess the risk profile of a SME applying for credit is the company's **repayment capacity**. A company's repayment capacity indicates to what extent debt can be repaid by the company's generated cash flow. Loan officers indicated that they only focus on the repayment capacity under normal circumstances. This is a company's repayment capacity generated from its normal, day-to-day business operations. The repayment capacity under normal circumstances is calculated by reducing the cash income under normal circumstances with the loan charges. Loan charges include the capital costs of existing loans but also the interest costs on possible new loans. By correcting the repayment capacity for the interest costs of new loans, the repayment capacity under normal circumstances indicates the company's ability to repay the amount lend. Because the average SME often does not have a detailed planning of its future investments and changes in the needs of its working capital, loan officers evaluate the SME's repayment capacity over a historical period. They calculate the repayment capacity under normal circumstances of the last three to five financial years. With an increasing trend, the average value is taken as a predictor for the future repayment capacity of the company. In the event of a declining or volatile performance of the historical repayment capacity, a bank will take the lowest recorded value as predictor for the future repayment capacity. The loan officers indicated that there are two main reasons why the evaluation of the repayment capacity is important for the credit decision process. The first reason is that the repayment capacity provides a signal to the bank. The repayment capacity is an indicator of the financial soundness of a company. A positive repayment capacity indicates a company that generates sufficient cash flow from its normal, day-to-day business activities to repay existing and new loans. When the calculated repayment capacity of a company shows an increasing trend, it indicates a well-performing enterprise in financial terms. However, a downward trend in the repayment capacity can be a signal for a company in difficulty. In the event of a downward trend, the bank should ask whether the decline is the result of a temporary underperformance of the company or whether the decline indicates a trend reversal. If the latter is true, loan officers indicated that the likelihood of obtaining credit is greatly reduced. The second reason why a firm's repayment capacity is important to the bank, is judicial in nature. The interviewed loan officers stated that the repayment capacity of a company applying for credit should be positive and greater than zero. If a bank grants credit to a company with a negative repayment capacity and this company comes into financial difficulties, the bank can be held liable. It is possible that in such a situation the borrower will be forfeited of the payment of its interests or even no longer has to

repay the borrowed amount to the bank. Banks avoid this risk by not granting credit to companies with a negative repayment capacity. How much the repayment capacity must be to have a favorable influence on the credit decision is not known. Loan officers stated that the minimum required repayment capacity is highly dependent on the size of the new credit and the sector in which the company operates.

Another factor that is important to the three loan officers when assessing a credit application is the company's **own contribution to the investment**. Each of the three loan officers explained that banks require the company to provide a certain percentage of the total amount of the investment itself. This requirement is primarily to hedge the credit risk of the bank. The larger the company's share in an investment, the less credit a bank has to provide. As a result, the loss given default of the credit application decreases which in turn decreases the expected loss for the bank. Banks will therefore have more funds available. These funds can be used to grant credit to other companies. In addition, the bank may hold a lower capital buffer if the companies' contributions in the investments are greater. Another reason why banks require a minimum own contribution in an investment is to guarantee the company's commitment. The experience of the loan officers shows that investments in which companies have a higher own share are less risky. The loan officers thus confirm what is found in academic research. Because these companies will take less risks, the chance of success increases and the probability of default reduces, resulting in a lower credit risk. Loan officers receive guidelines from their bank regarding the minimum required size of a company's own contribution in an investment. These guidelines often differ from bank to bank. One of the interviewed loan officers stated that the bank he works for initially asks an own share of investment of thirty percent. This percentage, however, was lower at the two other banks. At one of these two banks the guideline was twenty-five percent, at the other it was fifteen percent. However, the three loan officers stressed that it is a general guideline. Depending on the sector and the financial performance of the company that requests credit, this percentage may be increased or decreased.

A third factor that influences the credit decision process and for which banks issue guidelines to its loan officers is the **solvency** of a company. A bank uses the solvency ratio to express a company's solvency. This ratio is calculated by dividing a company's equity by its balance sheet total. Loan officers agreed unanimously that banks attach great importance to this ratio. The solvency is in fact a measure of the resilience of the company. The greater the solvency ratio, the better a company's resilience. Loan officers stated that a company faces an increased risk of bankruptcy when solvency is low. A too low solvency increases the vulnerability to setbacks in the long term. With a low solvency, there is an increased chance that the company will be unable to meet its obligations and will experience cash flow problems. The capital of a firm acts as a buffer against liquidity problems. In order to limit their credit risk, banks therefore issue guidelines on the minimum required solvency of a SME applying for credit. Two of the three lenders said their bank applies a minimum solvency ratio of twenty-five to thirty percent. The third loan officer said that his bank requires a minimum solvency ratio of twenty to thirty percent. Only if a company's financial results are strongly positive, a bank accepts lower minimum solvency ratios. One of the lenders added that even this reduction is limited. For example, his bank does not grant credit if a

company's solvency ratio is lower than ten percent. Although the minimum required solvency ratio can be reduced, it can also be increased for some companies. One of the banks where the guideline for the minimum solvency ratio is between twenty-five and thirty percent, requires an increased minimum solvency ratio for certain sectors. The banker stated that it involves a number of sectors that are more risky. For companies active in retail food trade, industry or construction, this bank requires a minimum solvency ratio of thirty-five percent. For restaurants and companies active in recreation, this minimum is increased to forty percent. Loan officers therefore recommend that companies with a low solvency first increase their equity before applying for credit. They indicated that this will increase the chance of attracting additional long-term debt financing. In addition, it will allow companies to anticipate on potential liquidity shortages more quickly. The **liquidity** of a SME applying for credit is usually examined together with its solvency because liquidity reflects the extent to which a company can meet its short-term obligations. Loan officers admitted that although liquidity is a factor that is assessed when making a credit decision, this factor is less important than solvency. There are two reasons for this. First, the majority of credits granted to SMEs are granted for the medium- to long-term. The solvency ratio therefore offers the loan officer better information than the liquidity ratio as the solvency ratio is a more long-term measure. Second, loan officers rely more on the repayment capacity of a company than on its liquidity ratio. The liquidity ratio may contain elements that are liquid in theory, but in practice could be less liquid than first predicted. Moreover, loan officers' experience shows that if a company has a good repayment capacity, it often has a good liquidity ratio too.

2.2.2. Qualitative factors mentioned by the interviewed loan officers

The above factors mentioned by the interviewed loan officers are factors that can be assessed on the basis of quantitative data. The three loan officers emphasized that lending is not an exact science. It is therefore also necessary to evaluate a company's creditworthiness on the basis of qualitative information about the firm. This qualitative information can help evaluate the company's probability of default.

According to the three interviewed loan officers, one of the most important qualitative factors to assess the risk profile of a SME applying for credit is the **antecedents history** of that company. This factor is hardly discussed in academic papers. In reality, however, it is a decisive factor for a loan officer. The audit of a company's antecedents is often one of the first steps of the credit decision process. The company's antecedents include practices such as late filing of the annual accounts, overdue tax payments or social security backlogs. Such antecedents often indicate a company in difficulty. Antecedents therefore increase the risk profile of a company. In turn, the company's probability of default increases which increases the expected loss - calculated as the probability of default multiplied by the loss given default - for the bank (Rashiti et al., 2016). The capital requirements of a bank are a function of this expected loss. Banks have to keep more capital aside when their expected loss increases. This capital cannot be used to grant loans or provide other activities with. As a result, higher capital requirements limit the quantity of borrowing in the economy and restrict the bank's operating activities (Rubio & Carrasco-gallego, 2017). Banks therefore prefer to keep their capital buffer as low as possible. They try to achieve this by, among others, minimizing their expected loss on loans and the associated credit risk.

For this reason, the loan officers unanimous agreed that there is little chance that loan applications of SMEs with a history of antecedents will be approved.

Besides taking into account a company's history of antecedents, the interviews showed that the three loan officers mainly look at the 'who', the 'what' and the 'where' aspect of the credit application. This research summarizes these three factors as the **'3 Ws' of lending**.

The first element of the '3 Ws' of lending, is the evaluation of the **'who'** dimension of the credit application. Loan officers evaluate both the company itself and the people managing it. In the qualitative evaluation of a company, loan officers mainly check the history of the organization. They check, among other things, when and by whom the company was founded, which activities the company carries out, the size of the workforce, the diversification degree of the customer base and how large the company's market share is. Furthermore, loan officers test the quality of the management of activities of the company. This means, for example, that loan officers will inform themselves about the production management of the company, that they check whether the company has reliable financial statements, whether there are regular checks within the organization, etc. In addition to the qualitative screening of the company itself, loan officers will also screen the company's management. Loan officers are primarily interested in the experience of the CEO and the management. The experience of the CEO and the management is important to the loan officers because these people are responsible for the daily management of the organization. They have to ensure that the investment will pay off. In assessing the CEO, loan officers mainly look at the CEO's leadership qualities. They examine which functions the CEO is exercising, how many years the CEO is working in the company, how many years the CEO is active in the sector and which qualifications the CEO has achieved. Loan officers compare this information with the financial performance of the company. This provides lenders better insight into the managerial qualities of the CEO. Loan officers will always check whether the CEO has personal loans with their bank. The credit history on these loans can reveal important information about his personal creditworthiness. Since many SMEs are owner-managed, the creditworthiness of the CEO can be an indicator of the creditworthiness of the company.

In addition to the company and its managers, loan officers are also interested in the shareholders of the company. Knowledge of the shareholders is important because these are the people who determine the future vision of the company. The audit of the shareholders is often less extensive than the audit of the CEO. For loan officers, the most important information about the shareholders is the knowledge and experience they have about the sector in which the company operates. In this respect, knowledge and experience of the shareholders who hold the most voting rights is most important as these shareholders have the greatest influence on the future prospects of the company. Loan officers also stated that the (private) relationship that could exist between shareholders, is less important. For example, the fact that a family holds the majority of the shares would not necessarily benefit the company in obtaining credit. The fact that a company may or may not be a family business, may result in an advantage as well as a disadvantage for the creditworthiness of the company. The interviewed loan officers thus confirm the scientific literature.

The second 'w' of the '3 Ws' of lending refers to the '**what**' component of the credit application. Banks want to know how a company is going to use the new credit amount. A loan applicant must therefore formulate a clear credit target – a document that provides a loan officer some necessary information about the investment itself. According to the loan officers this credit target should contain some specific elements. First of all, it must be clearly stated what the company will use the credit for. Loan officers need this information because they will choose the most appropriate form of credit according to the company's financing needs. For example, for the financing of investments such as the purchase of machines or real estate, a lease or investment loan will be the most suitable form of credit. This information will also determine the term of the loan. For example, company buildings lasts longer than company cars. If a company requests credit for the financing of a company car, the loan will have to be repaid more quickly than if the company applied for credit for financing an extra business building. Furthermore, the company must be able to demonstrate clearly why the investment is relevant. The economic importance and the added value of the investment must be justified. Loan officers emphasized here that a mere description of the reasons and the benefits of the investment project are not sufficient enough. Loan officers also want to know what risks the investment could entail and what impact the investment project will have on existing business operations. An objective and realistic representation of the pros and cons associated with the project is thus essential for the loan officers. Finally, each borrower must indicate the amount he or she wishes to borrow. It is important that the borrower clearly recognizes the size of the requested credit. A substantiated breakdown of the requested credit on the business domains in which the credit will be used, can help. A company applying for credit must also clearly state when it expects a credit decision from the bank and from when it needs the funds.

The final element of the '3Ws' of lending is the '**where**' component of a credit application. By this, loan officers refer to the sector in which a company applying for credit is active. Especially the characteristics and the profitability of a company's sector are important to the bank. Loan officers indicated that each bank has her own image. Loan officers must respect this image and must be cautious not to damage this reputation with their individual actions and decisions. Information about the nature of the sector is therefore important. There are a few sectors to which a bank will not grant credit to because lending to these sectors can damage the bank's reputation. The three loan officers said that their banks would never, for example, grant credit to arms manufactures, gambling offices and casinos, companies involved in prostitution or fur manufacturers. Furthermore, there are some companies to which the bank is prohibited - by external parties such as governments and financial regulators – to provide credit to. It concerns companies that are listed on the so-called 'black list'. This black list includes the names of companies linked to embargo countries which pose a threat to international security or do not respect international rules, terrorism and the so called 'underground economy'. These companies will not receive credit not only because of the potential reputation damage or high risk for the bank, but also because the bank can be severely sanctioned when granting credit. In addition to the black list provided by external parties, each bank also has its own 'internal' black list. Banks call this list the list of high-risk customers. This list contains the names of companies with whom the bank has had bad payment experiences, that have had bankruptcies, that committed fraud or participated in other malpractices.

If the loan officer decides that the lender's sector cannot harm the bank's image, the loan officer will evaluate the profitability of the sector. The profitability of the sector is an important driver for the profitability of the investment. The evaluation of the sector's profitability often takes place on the basis of Porter's five forces analysis whereby loan officers will assess the bargaining power of the company's suppliers and buyers, the industry rivalry and the threat of new entrants and substitutes (Mathooko & Ogutu, 2015). Loan officers recommended SMEs applying for credit to always include a complete, detailed description of the profitability of their sector in the credit application.

A very last finding, but nevertheless an important one, relates to **collateral**. Various scientific researchers agree that collateral is one of the most important factors in the credit decision process. For example, collateral belongs to the '5 Cs' of lending – a concept that was described earlier in this study. Most researchers mention in their studies that collateral is an active decision-making factor. They state that collateral actively determines whether a SME receives the requested credit or not. However, the three interviewed loan officers contradict this statement. They rather see collateral as a passive decision-making factor because the provision of collateral is not sufficient by itself to receive credit. Loan officers will never grant credit because of sufficient collateral. They will initially take their credit decision based on the previously mentioned factors. If they decide that the application is creditworthy, then collateral will be taken into account. The credit decision is never based on the availability of collateral, but still can be influenced by it. The bank requires collateral to reduce its credit risk as it will decrease the loss given default of a bank's investment. The required value of the collateral that the company has to provide, depends on two factors. On the one hand, the value of the required collateral is determined by the size of the credit amount. The greater the amount of credit, the greater the value of collateral must be. On the other hand, the required value of the collateral is determined by the loan officers based on their risk assessment of the credit application. If a loan officer approves a credit application but is of the opinion that there is an above-average risk associated with the investment, the value of the collateral must be higher. With a low investment risk, on the other hand, the contribution of collateral can remain minimal and might even not be necessary. Loan officers also added that if a company cannot provide sufficient collateral, the credit application can still be approved. In the case of insufficient collateral the credit conditions can be revised. For example, a loan officer may require a shorter repayment period or charge a higher interest rate.

Table 1 provides an overview of the main determinants of the credit decision process according to scientific literature and the interviews.

Determinant	Scientific literature	Interviews
Quantitative factors		
Repayment capacity	X	X
Own share of investment	X	X
Solvency	X	X
Liquidity	X	
Past performance	X	X
Collateral	X	
Firm size	X	
Qualitative factors		
Antecedents history		X
CEO's experience	X	X
Management experience	X	X
Risk proclivity	X	
Borrower-lender relationship	X	
Related business experience	X	
Family ownership	X	X
Human capital of the lender	X	

Table 1: Overview of the main determinants of the credit decision process according to academic papers and the interviews

Out of the literature study and the interviews, five factors are identified which are believed to have the most important influence on a loan officer's credit decision. These five factors are: experience of the CEO, repayment capacity, history of antecedents, own share of investment and solvency. Interview results and scientific research, however, show that there is some ambiguity about the influence of family ownership. For the completeness of this research, therefore, the importance of the factor 'family ownership' on the credit decision is also examined. Based on the interviews, we expect the following order of importance – in decreasing order – of these six factors: antecedents history (1), repayment capacity (2), experience of the CEO (3), solvency (4), own share of investment (5) and family ownership(6).

Hypothesis 1: The order of importance of the six studied credit decision criteria in this paper will be as follows: (1st) antecedents history - (2nd) repayment capacity - (3rd) experience of the CEO - (4th) solvency - (5th) own share of investment - (6th) family ownership.

Furthermore, we expect that the higher the values of the factors 'own share of investment', 'solvency' and 'repayment capacity', the higher the chance that the SME's credit request will be approved by the loan officer. Interview results and scientific literature show that the higher the values of these factors, the better the financial position of the company that applies for credit. This reduces the credit risk for the bank, making the loan officer more willing to grant the requested credit. We also expect that the

more experienced the SME's CEO is, the higher the chance of credit approval because loan officers will have more faith in the CEO's leadership capabilities to ensure a successful investment.

Hypothesis 2: The factors 'own share of investment', 'solvency', 'repayment capacity' and 'CEO experience' will have a positive coefficient.

Next, we expect that if a SME has no antecedents history, loan officers will be more inclined to grant credit to the company. The interviewed loan officers have emphasized that it will be very difficult for a company with an antecedents history to get their credit request approved.

Hypothesis 3: The factor 'antecedents history' will have a positive coefficient, indicating that a credit request of a company with no antecedents history has an increased chance on approval.

Finally, we expect that the factor 'family ownership' will not have a significant effect on the credit decision because there is no consensus in the scientific literature or by the interviewed loan officers about the factor's effect. As mentioned in scientific studies, some authors believe that a company classified as a family business will have an advantage over non-family businesses in obtaining credit approval. According to these authors, family businesses are perceived to be more risk averse than non-family businesses which reduces their tendency to invest in risky projects and therefore increases their chance of obtaining credit. Other authors take the opposite view. These authors believe that being a company classified as a family business will reduce the loan officer's tendency to approve credit. They believe that family businesses have more incentives to extract private benefits at the expense of other investors. Therefore, we expect that both effects – the positive and the negative effect – will counteract each other so that the factor 'family ownership' will not be significant.

Hypothesis 4: The factor 'family ownership' will not have a significant effect on a loan officer's credit decision.

These hypotheses are tested next, by conducting both a conjoint analysis and an ordinary least square (OLS) multiple linear regression.

3. Empirical study

Research design

In this section the above hypotheses are tested. The first part of the empirical study examines the order of importance of the six factors via a conjoint analysis. The second part examines the statistical and economic significance of these six factors using an ordinary least square (OLS) regression.

Conjoint analysis is a frequently used quantitative technique in marketing (Bodog & Florian, 2012). This analysis method is often used by companies because it allows them to find out which attributes their customers value most when they purchase the company's goods or services. The conjoint analysis is based on the idea that an object determines its value from the value of its attributes. By making

judgements about varying combinations of different values of the attributes, conjoint analysis allows the researcher to identify the relative contribution of each attribute (Dawson, 2011). In this research, the judgement consisted of the probability that participating loan officers would support the credit request of a hypothetical Belgian SME called 'company ABC'. This hypothetical company is a producer of industrial material. It is a business in expansion with a total workforce of thirty people and an average yearly turnover of 2,835,500.00 euro. The company produces fifteen different products, has a market share of 5% and competition is neither intense nor weak. This business is applying for credit for the financing of new machinery to improve the production process and reduce production costs. The total amount of the investment is 250,000.00 euro and a ROI of 12% - the industry average - is expected. The company requests credit for the financing of this investment at the participating loan officer's bank. Participating loan officers were asked the question: "What is the probability that you will grant company ABC the requested credit in the scenario below?". Variation in the scenarios consisted of the values given to the six factors studied in this research. Loan officers had to indicate their decision on a seven-point scale ranging from 'Extremely unlikely' - score 1 - to 'Extremely likely' - score 7. The assumption was made that company ABC could provide the bank enough collateral in case credit was granted. This assumption was made because interview results showed that collateral is not an active credit decision factor but rather a passive factor.

Sample

For the research, the cooperation was requested from loan officers working at one of the four largest banks (cf. interview results) in Belgium. The three banks that participated in the interview immediately promised their cooperation in the research. The one bank that did not participate in the interview, however, wanted to participate in the research. Eventually seventy loan officers cooperated in the research.

The sample represents a wide range of loan officers. Approximately two third of loan officers were male (65.71%), education background varied between no higher education (1.43%); professional bachelor degree (35.71%); academic bachelor degree (17.14%); academic master degree (34.29%); advanced master degree (10%) and MBA (1.43%). Age ranged between 22 and 61 years (average 46 years). The loan officers had an average experience in the banking sector of 22 years (minimum 1, maximum 42 years) and an average loan processing experience of 14.5 years (minimum 1, maximum 35 years). On average, the loan officers processed 331 credit applications of SMEs last year.

3.1 Conjoint analysis

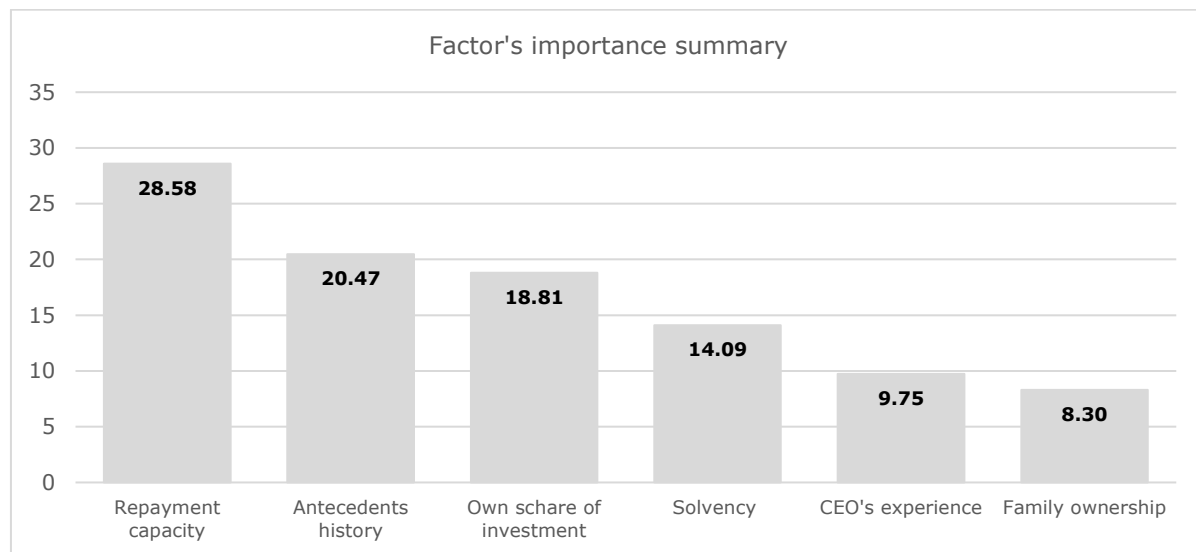
Experimental design

In total, there are six credit decision factors whose order of importance must be investigated. To examine this order of importance, the values given to these six credit decision factors will change in each scenario. Since each of the six factors can take on two possible values, 64 (2^6) different scenarios can be formed. Assessing these 64 scenarios would be very time-consuming for the participating loan officers. To avoid this, an orthogonal fractional design was used to reduce the total number of scenarios to be assessed to

eight. The assessment of the eight scenarios was done online via the Qualtrics software program. To avoid order effects, these eight scenarios showed up in random order to each participating loan officer. After all answers were collected, a conjoint analysis was performed in SPSS to determine the order of importance of the six factors.

Results

From the conjoint analysis follows the following order of importance – in decreasing order – of the six factors: repayment capacity (1), antecedents history (2), own share of investment (3), solvency (4), experience of the CEO (5) and family ownership (6). The average importance score of each factor is shown in graph 1.



Graph 1: Individual importance of the studied credit decision criteria

The results show that when loan officers assess a credit application from a SME, they attach the greatest importance to the business' repayment capacity. The average weight of the repayment capacity on the credit decision is 28.58. This implies that loan officers will make their credit decision dependent on a company's repayment capacity for an average of 28.58%. In contrast, loan officers attach very little importance to the nature of a company that applies for credit. Loan officers let determine their credit decision only for 8.30% (on average) on whether the company is a family business or not. Furthermore, it can be concluded that the results of the conjoint analysis are largely consistent with our expectations, as shown in table 2. Hypothesis 1 is therefore not rejected. As expected, loan officers attach the greatest importance to the repayment capacity and the antecedents history of a SME. Almost half (49.05%) of their credit decision will be based on these two factors. Moreover, the importance that loan officers attach to quantitative data in their credit decision, must be emphasized. The results of the conjoint analysis show that the credit decision for 61.48% – the sum of the individual importance of the repayment capacity, own share of investment and solvency – is based on quantitative data.

Ranking based on conjoint analysis		Expected ranking	
1	Repayment capacity	Antecedents history	1
2	Antecedents history	Repayment capacity	2
3	Own share of investment	CEO's experience	3
4	Solvency	Solvency	4
5	CEO's experience	Own share of investment	5
6	Family ownership	Family ownership	6

Table 2: Comparison of the ranking of the studied credit decision criteria based on the conjoint analysis and the expected ranking

3.2 OLS regression

Experimental design

To verify the statistical and economic relevance of the six factors, the following regression model was performed in STATA:

$$\begin{aligned}
 \text{Score} = & \beta_0 + \beta_1 \text{OwnShareOfInvestment} + \beta_2 \text{Solvency} + D_1 \text{RepaymentCapacity} \\
 & + D_2 \text{AntecedentsHistory} + D_3 \text{CEOexperience} + D_4 \text{FamilyOwnership} + \gamma_1 \text{Age} + \gamma_2 \text{Gender} \\
 & + \gamma_3 \text{BankExperience} + \gamma_4 \text{LendingExperience} + \gamma_5 \text{EvaluatedCreditApplicationsLastYear} \\
 & + D_{\gamma_1} \text{Education}
 \end{aligned}$$

Variables

Dependent variable

The dependent variable in this research is called 'Score'. It refers to the average probability that a loan officer will grant credit to company ABC.

Independent variables

The independent variables in this research consist of the previously mentioned six factors that influence a loan officer's credit decision. The six independent variables, together with their possible values, are shown in table 3.

Independent variable	1 st value	2 nd value
Antecedents history	Company ABC is always on time with paying social security and taxes	Company ABC had a social security backlog last year
Repayment capacity	Company ABC has an average repayment capacity of 122,552.00 euro, which is perceived as high	Company ABC has an average repayment capacity of 9,922.00 euro, which is perceived as low
Own share of investment	Company ABC finances 40% (100,000.00 euro) of the total investment amount	Company ABC finances 5% (12,500.00 euro) of the total investment amount
Solvency	Company ABC has a solvency ratio of 31.94% which is above the industry average of 21.80%	Company ABC has a solvency ratio of 6.65% which is below the industry average of 21.80%
CEO's experience	The CEO of company ABC has 15 years of experience in the sector, is CEO of the company for 10 years and has proven his leadership capabilities	The CEO of company ABC has 6 years of experience in the sector, is CEO of the company for 1 year and it is the first time he is in charge of a company
Family ownership	Company ABC is a family business	Company ABC is a non-family business

Table 3: Independent variables

Control variables

In order to clearly identify the relationship between the dependent variable and the independent variables, following control variables were used in this research:

Control variable	
Age	Participating loan officers were asked to state their age.
Gender	Participating loan officers were asked to state their gender.
Education	Participating loan officers were asked to indicate their highest level of education. They could choose from the following options: no higher education, professional bachelor, academic bachelor, academic master, master after master or MBA. Education is represented in the regression model by a dummy variable that takes value 0 if the loan officer's education is an academic bachelor degree or lower (no higher education, professional bachelor or academic bachelor degree) and the value 1 if the loan officer's education is an academic master degree or higher (academic master degree, master after master or MBA).

Banking experience	Participating loan officers were asked to state how many years they have been working for a bank.
Lending experience	Participating loan officers were asked to state how many years they have been working in the credit department.
Evaluated credit applications last year	Participating loan officers were asked to state the number of credit applications by SMEs that they have evaluated last year.

Table 4: Control variables

Results

Intercept and variables	Coefficient	Robust standard error
Intercept	4.17***	0.39
Own share of investment	1.98***	0.26
Solvency	2.06***	0.35
Repayment Capacity	1.18***	0.089
Antecedents history	0.72***	0.089
CEO experience	0.013	0.0099
Family ownership	0.02	0.089
<i>Control variables</i>		
Age	-0.018*	0.011
Gender	-0.53***	0.085
Education	0.19**	0.091
Bank experience	0.010	0.011
Lending experience	0.017**	0.0066
Evaluated credit applications last year	0.00055***	0.00020

n = 560

R - squared = 0.4101

These statistics have been calculated using ordinary least square regression analysis (OLS)

* p < .1

** p < .05

*** p < 0.01

The results of the linear regression show that the factors own share of investment, repayment capacity, solvency and antecedents history have positive effects and are statistically significant at a 1% significance level. On the other hand, CEO experience and family ownership are not statistically significant. These results correspond with the results of the conjoint analysis and our expectations. Hypothesis 2, hypothesis 3 and hypothesis 4 can therefore not be rejected. Results suggest that when a company has no antecedents history, the average score given by the loan officer increases by 0.72

points. Furthermore, solvency and own share of investment appear to have a relatively large influence on the credit score. If the company's solvency or own share of investment increases by 1%, the average credit score will increase by 0.0206 and 0.0198 points respectively.

Regarding the control variables, gender and evaluated credit applications last year both appear to be statistically significant at the 1% significance level. Education and lending experience are both statistically significant at the 5% significance level and the control variable age is statistically significant at the 10% significance level. It is worth mentioning that although the number of years of lending experience has a positive, significant effect on the average credit score, the number of years of bank experience does not appear to be significant. Furthermore, it should be noted that although the number of evaluated credit applications last year is statistically relevant, this factor has a low economic relevance. Each additional covered credit application appears to decrease the risk perception of the loan officer, resulting in a small increase in the credit score of 0.00055 points.

4. Discussion

The results of this study provide useful information about the evaluation of loan applications from Belgian SMEs faced by Belgian loan officers. Several factors are identified which significantly affect the credit decision. Results of the conjoint analysis and the OLS regression suggest that – in decreasing order of importance – repayment capacity, antecedents history, own share of investment and solvency all affect the credit decision made by Belgian loan officers. The two other factors that were included in this research – CEO experience and family ownership – do not appear to significantly affect the credit decision. These results largely meet our expectations, as previously shown in table 2. First of all, it was expected that a SME's antecedents history and repayment capacity would have the greatest influence on the credit decision of a Belgian loan officer. Although not described in scientific literature, antecedents history was expected to be of big importance because all three interviewed loan officers stressed the importance of this factor. For some banks the presence of a late filing of the annual accounts, an overdue tax payment or social security backlogs, posed a no-go in allowing credit. In addition, repayment capacity was frequently cited as a critical factor to determine the risk of a loan in scientific literature – as it is deducted from past performance – as well as by the interviewed loan officers. A good, proven repayment capacity would give loan officers more confidence that the SME will be able to pay off its new debt obligations – repaying the borrowed amount and associated interest – in the future which reduces the SME's default risk. For these reasons, it was expected that the biggest emphasis would lie on these two factors. This expectation is confirmed by the results of the conjoint analysis; repayment capacity and antecedents history together account for almost half (49.05%) of total importance. Second, the importance of a SME's solvency on a loan officer's credit decision was as expected. It was expected that the solvency of the firm – as an indicator of its current financial position – would have a high influence on the credit decision, although its influence was expected to be lower than the influence a SME's antecedents history and repayment capacity would have on a loan officer's credit decision. This factor was expected to be ranked lower because – even though the financial position of a SME is a very important criteria in

determining its creditworthiness – it is believed that a firm with a high past performance would also be able to represent a stronger current financial position resulting in a good solvency ratio. Furthermore, we expected that family ownership would have the least impact on a loan officer's credit decision. Both scientific literature and the interview results showed that there is a great deal of uncertainty about the magnitude and direction of this factor on the credit decision. For example, according to some authors, family businesses would have a positive effect on the credit decision because these companies take fewer risks. On the other hand, other authors claimed that family businesses can have a negative influence on the credit decision because family owners may have more incentives to extract private benefits at the expense of other investors. The results of the conjoint analysis confirmed our expectations by indicating that a loan officer's credit decision is (on average) only based for 8.30% - the lowest percentage of all – on the fact that a SME is a family business or not. In addition, the results of the OLS regression emphasized the unimportance of this factor on the credit decision by stating that the factor is not statistically significant.

What was not expected, is the relative unimportance of the experience of the SME's CEO on a loan officer's credit decision. This is perhaps one of the most interesting findings of the conjoint analysis. Based on both scientific literature and interview results, it was expected that this factor would have an important impact on the credit decision. Especially during the interviews, the loan officers all stated that 'who' applies for credit is a very important factor. Remarkably, the results from the conjoint analysis indicate that the influence of this qualitative factor is only minimal (9.75% on average), and even statistically insignificant when analyzed using an OLS multiple linear regression. Furthermore, while CEO experience has a much lower importance than expected, the share of the investment the company finances itself appears to have a higher than expected importance on a loan officer's credit decision. This finding might be explained by the fact that in the scenarios presented to the loan officers, the amount of the loan drastically declined when the SME applying for credit finances a large part of the investment by itself compared to when the enterprise finances only a small amount of the investment by itself – a loan request of 150,000.00 euro versus 237,500.00 euro respectively.

In general, three important insights can be drawn from these results: (1) Quantitative factors have the most influence on a credit decision, (2) the credit decision process is conservative and (3) the history of the SME applying for credit is more important to obtain credit than the company's future prospects. As the results of the conjoint analysis show, the credit decision of a Belgian loan officer is based for 61.48% (on average) on quantitative data, with the SME's repayment capacity being the most important quantitative factor. Although banks often claim different, qualitative factors hardly appear to influence the credit decision. The only important qualitative factor to loan officers is the SME's history of antecedents. The great importance that quantitative factors have on the credit decision may be explained by the stricter supervision of the banking sector after the introduction of the Basel Accords. These Basel Accords provide strict capital requirements for banks to prevent them from entering in financial difficulties. If a bank still experiences financial problems, the financial regulator will check if the bank is personally at fault. If the bank is actually at fault, it can be heavily penalized. Since granting credit to

businesses is one of the main activities of commercial banks, it is not incomprehensible that commercial banks attach more importance to the quantitative factors of a company applying for credit than to the company's qualitative factors. Quantitative factors are very objective in nature, in contrast to qualitative factors which are subjective in nature, and which value can therefore be interpreted differently by different people. For this reason, it will be easier for a bank to demonstrate on the basis of quantitative information that it is not at fault and has acted correctly. Because repayment capacity is the most important factor to a Belgian loan officer when assessing a credit application, this study suggests that the credit decision process of Belgian banks is rather conservative. As mentioned in the interview results, loan officers indicated how they measure the repayment capacity of a SME that applies for credit. First, the company's past repayment capacity is calculated over a series of years based on cash flow from normal day-to-day business operations from which loan charges of both current and new loans are deducted. These calculated past repayment capacities are then used to calculate a measure for the repayment capacity of the company in the future. How this future repayment capacity will be calculated, depends on the trend that the past repayment capacity shows. With an increasing trend, the average value is taken as a predictor for the future repayment capacity of the company. In the event of a declining or volatile performance of the historical repayment capacity, a bank will take the lowest recorded value as predictor for the future repayment capacity. This method of calculation is very conservative and implies that the credit decision process in Belgium is nevertheless a conservative one. Moreover, this example of the conservative measurement of the repayment capacity – together with other results of this study, and in particular the importance of the antecedents history – prove that the history of a SME applying for credit is of great importance for the credit decision process. Loan officers use historical data to evaluate three of the four most important factors – repayment capacity, antecedents history and solvency – which will determine more than sixty percent (63.14%) of the outcome of the credit decision on average.

5. Research limitations and suggestions

This study tried to derive the importance that loan officers place on different factors during the evaluation of a loan application. Therefore, several loan officers were asked to evaluate eight different scenarios. Although these scenarios were constructed to present as much information as possible for the credit evaluation, in real situations loan officers would have access to much more information about the applying company when assessing its creditworthiness. In practice bankers are able to ask questions, obtain more information and clarify certain issues by interacting with the applicant. A major limitation of this study therefore is that the questionnaires submitted to loan officers could not fully include all information to which loan officers have access to in their actual settings. Furthermore, loan officers are not used to giving a probability that they would accept a loan application, which is the main question asked in the questionnaire. This unfamiliarity with the posed question might have influenced their answers.

Another issue with this study, as is the case with most studies based on a questionnaire, is that the participating loan officers might have answered the questions differently because they know their responses will be studied. If this is the case, the results of this study might not fully reflect the importance loan officers place on the different factors in evaluating real loan applications. The generalizability of this experiment greatly depended on the amount of answers obtained from loan officers. To obtain as much responses as possible, only a limited amount of scenarios were included in the questionnaire. Because of this fear of lack of responses when the questionnaire would include more scenarios, the eight included scenarios were not duplicated in order to assess test-retest reliability, as is usually done with scenario-based experiments. The omission of this test might affect the quality of the responses. The inclusion of only a small amount of scenarios also implicated that only a small amount of factors could be studied. In this case, six factors were studied which were expected to have an influence on the credit decision of a Belgian loan officer. In reality it can be expected that there are numerous factors affecting this decision. This limitation of the study also poses opportunities for future research to examine the possible influence of other factors on the loan application or to conduct a similar study on a larger scale employing more factors and questioning more loan officers. Also, this study focusses on SMEs applying for an investment loan, therefore the results should only be considered as important factors when applying for this kind of loan. Whether these factors remain important when applying for a different kind of loan could be the subject of future research. It might be very interesting for future research to conduct a similar experiment on different kind of loans like working capital loans, revolving loans or even consumer loans. All this possible future research would be very helpful in increasing the knowledge about bank decision making.

6. Conclusion

This research has shown that the most important factors to which Belgian loan officers attach importance when assessing a credit application from a SME, are the company's repayment capacity, antecedents history, own share of investment and solvency. With this result, this research makes an important contribution to scientific literature by exposing antecedents history as an important credit decision criteria which was not yet identified by previous studies. This study has revealed that the credit decision process is very conservative and still heavily relies on the assessment of quantitative data that is based on historical information of the credit-demanding SME. Therefore, these results suggests that both start-ups and SMEs that have grown very strongly in recent years, may have more difficulty in obtaining credit. This is regrettable for the Belgian economy as these companies are strongly represented in the Belgian society and often create a lot of employment and added value.

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