The Impact of German Guarantee Banks on the Access to Finance for SMEs

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Abstract

German guarantee banks provide guarantees for small and medium-sized enterprises (SMEs) that apply for bank loans but cannot provide their own valuable collateral; this lack of collateral would normally lead to credit restrictions. Consequently, the central aim of guarantee banks is to enable SMEs to be eligible for loans. In Germany, the state provides counter-guarantees in the range of 65-80 per cent of the guarantee bank's guarantee. To justify the governmental intervention and the risk-taking of the state, guarantee banks need to be evaluated regularly. The literature review has revealed that additional research about German guarantee banks is needed. Some interesting literature exists about the ability of guarantee schemes to alter the lending behaviour of banks and reduce information asymmetries between the lenders and the borrowers. However, the literature review has demonstrated that these mechanisms have not yet been tested empirically. The present research provided a unique research approach for bridging this gap. Following the conceptual literature, the research aim was to test the ability of German guarantee banks to compensate collateral shortfalls and make available loans to SMEs, reduce information asymmetries, create lending relationships and mitigate credit restrictions immediately as well as in a sustainable way. This was done by carrying out a web survey with firms that have received a guarantee from guarantee bank Hesse as well as conducting semi-structured research interviews with bank managers. The results have demonstrated that the provision of a guarantee from a guarantee bank provides the missing collateral to banks and makes available loans to otherwise credit restricted SMEs. Evidence has been found for a reduction of information asymmetries and a creation of lending relationships between the borrower and the lending bank. Moreover, connections between an application for a guarantee and the support of the region and cross-selling aspects of commercial banks have been revealed.

Declaration

This thesis is submitted to Edinburgh Napier University for the Degree of Doctor of Philosophy. The work described in this thesis was carried out under the supervision of Prof. Simon Gao, Prof. Dr. Thomas Henschel and Prof. Dr. Birgit Wolf. The work was undertaken in the School of Accounting, Financial Services and Law, Napier University, Edinburgh, UK.

In accordance with the regulations of Napier University governing the requirements for the Degree of Doctor of Philosophy, the candidate submits that the work presented in this thesis is original unless otherwise referenced within the text.

During the period of research the following papers have been published and/or presented:

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Valentin, A., Wolf, B., "The impact of German Guarantee Banks on the access to finance for SMEs", Second Research Forum on Small and Medium-Sized Enterprises, Siegen, 2010.

Valentin, A., "Credit Guarantee Schemes for SMEs in Germany: Theoretical Foundations and Empirical Analysis", ICAS Research Development Conference, Edinburgh, 2010.

Valentin, A., "The impact of German Guarantee Banks on the access to finance for SMEs", ScotDoc, Edinburgh, 2010.

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I would like to thank Prof. Dr. Martin Schmitt for being a competent reference person for statistical issues. Additionally, special thanks go to all people that supported the research by discussing and pre-testing the survey and interview questions.

When I started the research I had been told that a PhD thesis is a journey with bright and sunny hills but also with long and gloomy valleys. For me, this turns out to be true. I especially want to thank Prof. Dr. Birgit Wolf and Prof. Dr. Thomas Henschel for guiding me through some of these valleys during my journey.

The same applies for Steffen Haag who always knew how to provide me with new strength when I needed it the most. I am grateful for his encouragement and support.

Finally, I would like to thank my family for believing in me and for ensuring that I never lost sight of the really important matters in life.

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List of Abbreviations

BCC	business client consultant
bn.	billion
CGS	Credit Guarantee Scheme
df	degrees of freedom
EaD	Exposure at Default
EL	Expected Loss
etc.	et cetera
e.g.	exempli gratia (for example)
GBP	Great Britain Pound
GDP	Gross Domestic Product
KfW	Kreditanstalt für Wiederaufbau (Reconstruction loan corperation)
MFI	microfinance institution
m	million
Min.	minutes
N	Number
PD	Probability of Default
RR	Recovery Rate
SBA	Small Business Administration
Sig.	Significance
SLGP	State Loan Guarantee Program
SME	small and medium-sized enterprise

statem.	statement
UK	United Kingdom
USA	United States of America
USD	United States Dollar
vs.	versus

1 Introduction

The present PhD thesis applies an innovative approach to measure the efficacy of the German Credit Guarantee Scheme to mitigate credit restrictions for small and medium-sized enterprises (SMEs). Since the research is concentrated on the German guarantee banks, the following sections provide some background information about SME financing in Germany and the German guarantee banks. This is intended to allow a better understanding of the overall subject. Section 1.1 starts with providing established definitions of SMEs. Section 1.2 highlights the importance of SMEs for the German economy. Since the research is concentrated on SME financing in Germany, Section 1.3 provides some crucial information about the German banking system and particular characteristics important for understanding this research. Essential information about SME financing in Germany is provided in Section 1.4. Section 1.5 provides a detailed overview about the characteristics and aims of German guarantee banks. Section 1.6 shows the research aim and objectives, and Section 1.7 outlines the structure of the thesis.

1.1 Definition of small and medium-sized enterprises

The present research is about funding small and medium-sized enterprises (SMEs). Therefore, the natural starting point is to explain how these firms can be defined. Usually, the literature distinguishes between qualitative and quantitative criteria to classify SMEs.

Qualitative criteria are used to define the term ‘Mittelstand’ in Germany. Mittelstand is an old German term with no French or English equivalents (De, 2005; Goeke, 2008). Thus, it is not used in the rest of the world (Goeke, 2008). To be defined as Mittelstand in qualitative terms, ownership and leadership have to be in the hands of one person or family (De, 2005; Becker and Ulrich, 2009a). In that case, the owner mostly is engaged in the operative business (Becker and Ulrich, 2009a; Krämer, 2003), bears the entrepreneurial risk, is personally liable and makes the strategic decisions (De, 2005). Table 1.1 illustrates the qualitative delimitation of the term Mittelstand.

Table 1.1: Qualitative delimitation of the German Mittelstand

	Mittelstand	**Non-Mittelstand**
Characteristic	Owner bears/undertakes	Leadership/management bears/undertakes
Risk	X	--
Liability	X	--
Operational assistance	X	--
Leadership	X	--
Description **Ownership:** **Risk:** **Liability:** **Operational assistance:** **Leadership**	 Controlling majority (alone or as family) Bears the entrepreneurial risk Personal liability Involved in all relevant operative decisions Gives instructions and makes all strategic decisions	

Source: De (2005), p. 173

The combination of ownership and leadership indeed suggests characteristics of the Mittelstand enterprise. Nevertheless, it makes no statement about the size of a firm. This is one of the disadvantages of the qualitative criteria. Therefore, the overwhelming majority of available statistics of SMEs uses countable, quantitative criteria. This also applies for the present research. According to the definition of the European Commission (see Table 1.2), three criteria are considered to define SMEs.

Table 1.2: European Commission SME definition

Enterprise category	Headcount	and	Turnover (in €)	or	Total assets (in €)
Micro	< 10		≤ 2 million		≤ 2 million
Small	< 50		≤ 10 million		≤ 10 million
Medium-sized	< 250		≤ 50 million		≤ 43 million

Source: (European Commission, 2006)

Following this definition SMEs are micro, small or medium-sized enterprises which

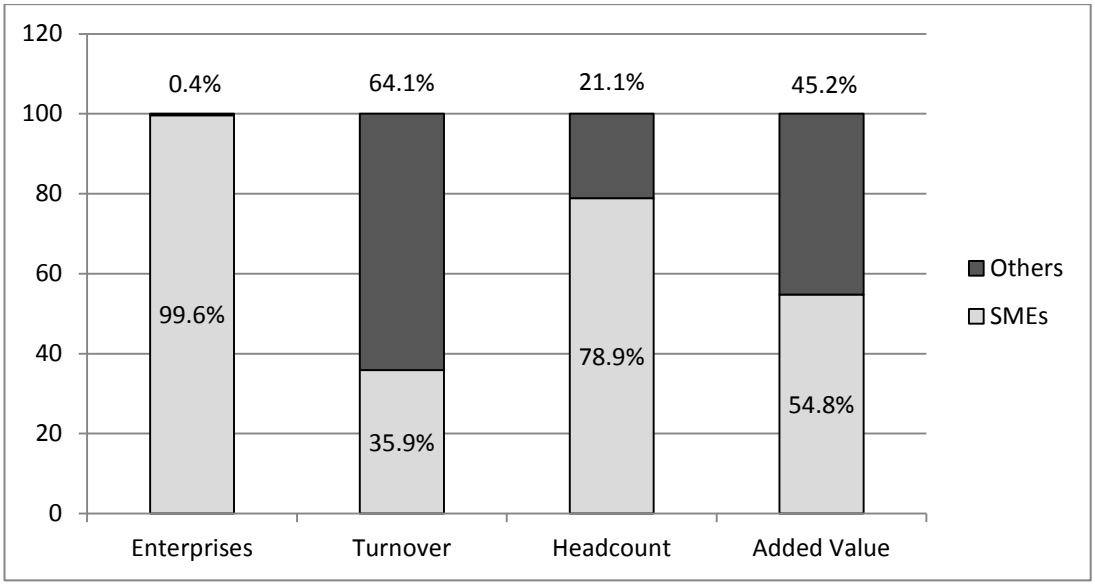
- have fewer than 250 employees and
- have an annual turnover of not more than 50 Mio. € or
- show total assets of not more than 43 Mio. €.

Moreover, they have to be autonomous. That means that they either have to be completely independent or have one or more investments in other businesses of less than 25 per cent each (minority partnerships) (European Commission, 2006).

1.2 Economic significance of SMEs

SMEs are an integral part of the German economy as is visible in Figure 1.1 below. In 2013 there were an estimated 3.72 million enterprises in Germany. Based on the definition of the European Commission 99.6 per cent of all enterprises were SMEs. In 2011, they accounted for 78.9 per cent of employment, 35.9 per cent of turnover and 54.8 per cent of net added value (Institut für Mittelstandsforschung, 2013).

Figure 1.1: Economic significance of SMEs in Germany



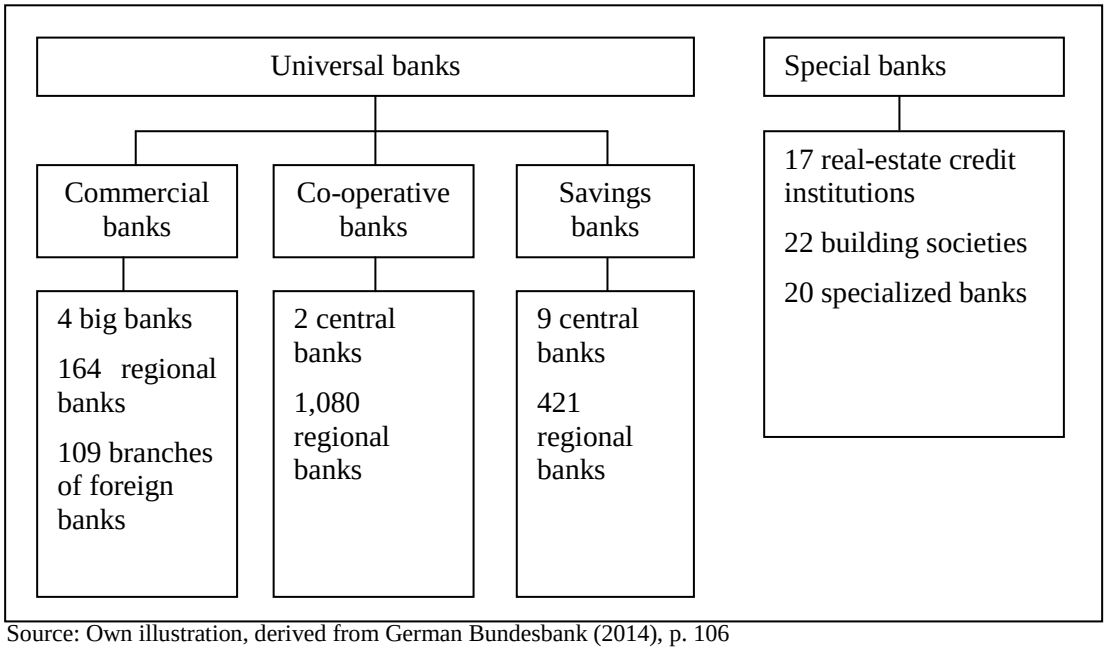
Source: Institut für Mittelstandsforschung [Institute for SME Research] (2013)

These figures clearly illustrate the significance of SMEs for the German economy. Their prevalence ensures a high competitiveness. SMEs are recognized as key sources of innovation, dynamism and flexibility (OECD, 2006; Geisen and Hebestreit, 2009; Arend and Zimmermann, 2009). They are deeply involved in the competition for the best ideas and products. A certain comparative advantage of SMEs is the rapid transformation of ideas in marketable products. Moreover, they often show a high degree of specialisation and ability to fill the smallest market niches (Geisen and Hebestreit, 2009). They are the engine of economic growth and employment (OECD, 2009; Geisen and Hebestreit, 2009). In 2012, 84.2 per cent of all apprenticeship positions were offered by SMEs (Institut für Mittelstandsforschung, 2013). Furthermore, they tend to hold on to their employees even in economic downturns. For that reason, they are an important buffer for the job market (Geisen and Hebestreit, 2009).

1.3 The German banking system

Since the present research is about financing SMEs in Germany, this section provides basic overview of the banking system in Germany. The German banking system is a typical universal bank-system. This means that, in general, all banks having a banking license are allowed to engage in all lines of banking business like commercial banking or investment banking. A special characteristic for the German universal banks is the fact that it consists of three pillars: commercial banks, co-operative banks and savings banks. Nevertheless there are also some special banks like mortgage banks or investment companies which operate in a limited banking sector (Hartmann-Wendels et al., 2007). This is not due to legal restrictions but a voluntarily taken strategic management decision. Figure 1.2 provides a more detailed overview about the German banking system.

Figure 1.2: The German banking system



Source: Own illustration, derived from German Bundesbank (2014), p. 106

The pillar of private commercial banks includes the big banks (Deutsche Bank, Commerzbank, Unicredit Bank, Postbank) as well as regional and other private banks (e.g. Sal. Oppenheim & Cie. as private bank) and branches of foreign banks (Stiele, 2008; Hackethal and Schmidt, 2005; Detzer et al., 2013; German Bundesbank, 2014). Whereas big banks operate within the whole country of Germany as well as abroad, regional banks typically operate inside a restricted geographical region within Germany (Hackethal and Schmidt, 2005; Hartmann-

Wendels et al., 2007). However, these banks can also be specialized to provide certain services such as loans for cars like Volkswagen Bank or Mercedes-Benz Bank for example (Koetter, 2013; Detzer et al., 2013). The largest big bank is Deutsche Bank followed by Commerzbank, Unicredit Bank and Postbank of which Deutsche Bank holds 93.7 per cent. Big banks traditionally act as house banks for the large industrial groups in Germany. Within the last decades, the big banks also strongly engaged in investment banking.

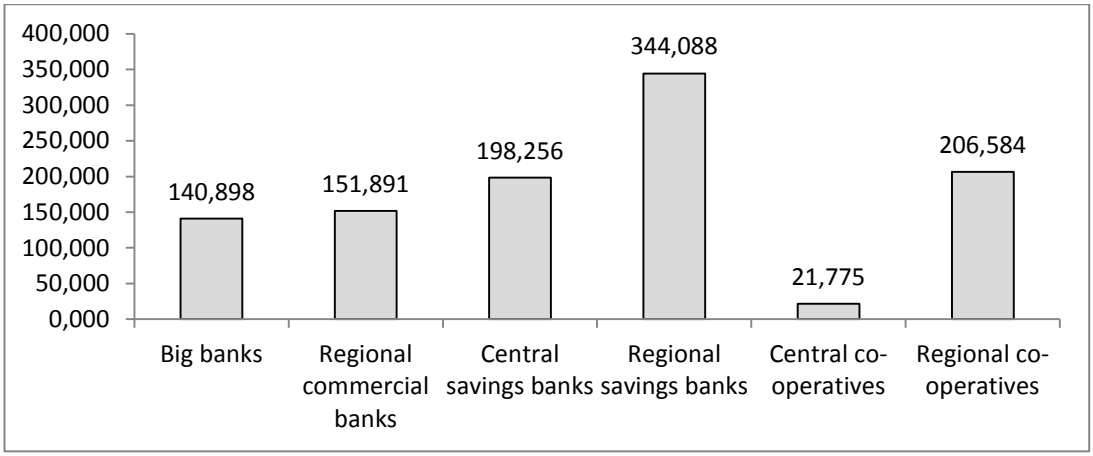
The second pillar consists of the co-operative banks. The co-operative sector includes the DZ Bank and the WGZ Bank. These two institutions act as central banks for the primary co-operative banks. The basic principle of co-operative banks in the years after their foundation was the principle of self-aid. The aim was to support farmers and artisans by transferring the savings of members to other members with financial needs. Profits were distributed among the members once a year (Hackethal and Schmidt, 2005). Nowadays, the principle of self-aid has lost importance. Co-operative banks no longer provide loans solely to members. Today, they rather act as regional banks that are limited to a certain region and do not compete with other co-operative banks from other regions (Hartmann-Wendels et al., 2007). Regional co-operative banks are typically concentrated on providing financial services to SMEs and private customers (Koetter, 2013).

The third pillar is built by the savings banks of which the vast majority are public banks which are held by the public sector like the federal government, states or even cities. They are owned by their communities, counties, administration unions or federal states. Savings banks are bound to the special savings bank laws of their federal state. They only operate within their local area to avoid competition with the savings banks in other regions. The aim of savings banks is to foster individual savings and to grant loans to members of the local communities. Profit maximization is not their primary business aim. The primary objective is to foster the economy within their region (Hartmann-Wendels et al., 2007; Hackethal, 2003; Hackethal and Schmidt, 2005; Stiele, 2008; Detzer et al., 2013). Like co-operative banks, savings banks are mainly focused on SMEs and private customers (Koetter, 2013). The sector of savings banks also contains the regional Landesbanken as well as the Deka Bank. The regional Landebanken act as central banks for the regional savings banks. Moreover, the Landesbanken typically act as banks for the regional states. Besides

this, they are also engaged in investment banking and corporate banking. The Deka Bank is the investment company of the savings banks and responsible for the asset management of all savings banks (Detzer et al., 2013).

Related to the research aim of the present study, the market shares of the German universal banks shall be demonstrated by highlighting the loans provided to domestic firms in year 2013. Figure 1.3 illustrates that regional savings banks as well as regional co-operatives provided the majority of the corporate loans in Germany.

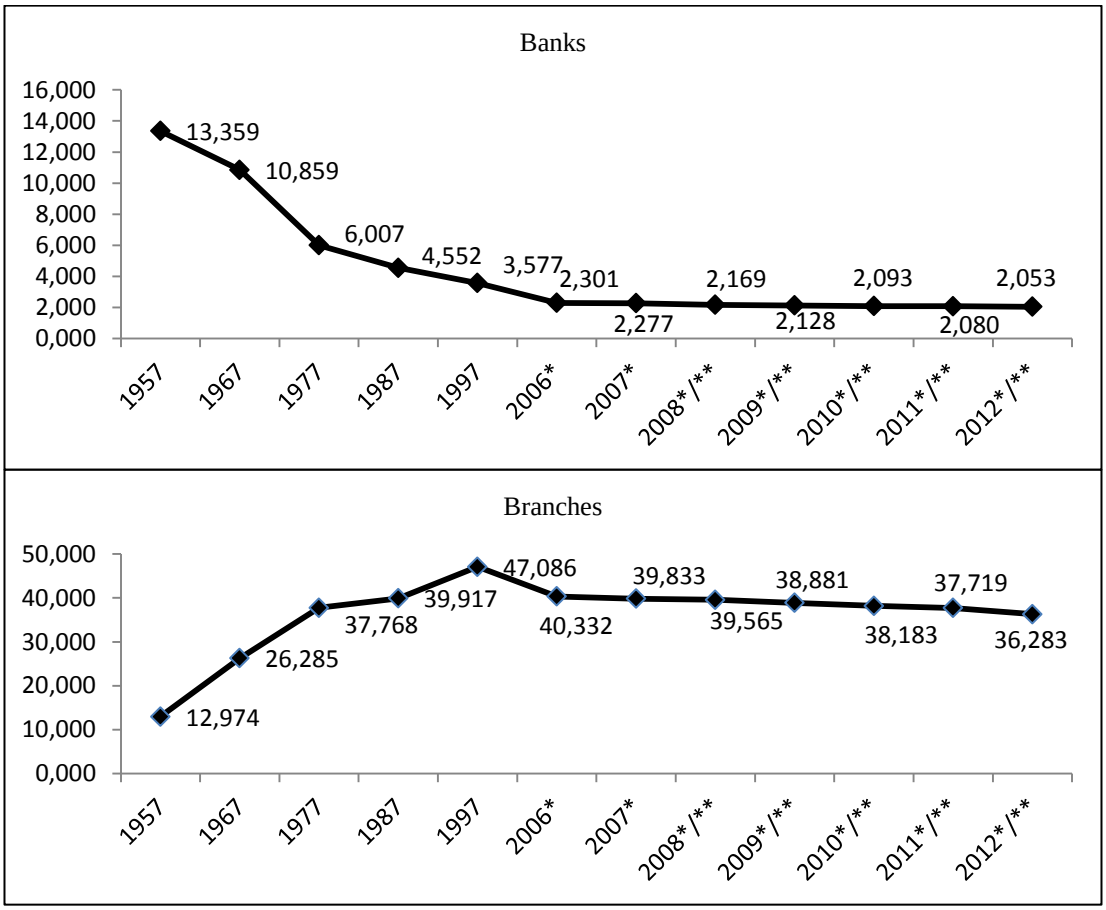
Figure 1.3: Loans provided to firms in 2013 (in million €)



Source: Own illustration, derived from German Bundesbank (2014), p. 46

There is a strong competition among the institutions, especially in retail banking and corporate finance. This is mainly due to the comparably high number of banks in Germany which has already decreased within the last years due to the strong competition which causes pressure to consolidate and negatively affects the overall profits (Koetter, 2013; Tiwari and Buse, 2006; German Bundesbank, 2013). In Figure 1.4 the numbers of banks and bank branches in Germany are illustrated by a time series starting in year 1957.

Figure 1.4: Number of banks and bank branches in Germany since 1957



Source: Own illustration, derived from German Bundesbank (2014), p. 104
*including Postbank; **excluding investment companies

Since consolidation among the three pillars is not allowed in Germany, the reduction has been caused by mergers and acquisitions within each of the pillars (Koetter, 2013). Table 1.3 demonstrates the consolidation process between 1993 and 2013.

Table 1.3: Decline of banks between 1993 and 2013 by banking sector

		Year 1993	Year 2013	Change
Commercial banks	Big banks	4	4	-
	Regional banks	199	164	-18%
Savings banks	Central banks	13	9	-31%
	Regional banks	703	421	-40%
Co-operative banks	Central banks	4	2	-50%
	Regional banks	2,761	1,080	-61%

Source: Own illustration, derived from German Bundesbank (2014), p. 104 and Koetter (2013), p. 9

The figures illustrate that the consolidation process was strongest for regional co-operatives and regional savings banks. Between 1993 and 2013, the number of regional co-operative banks was reduced by 61 per cent and the number of regional savings banks was reduced by 40 per cent.

The German lending system is traditionally bank-based (Stiele, 2008; Behr and Guettler, 2007; Hummel, 2011). The predominant sources of external financing in Germany are bank loans. Bank lending in Germany is characterized by close and long-term relationships between customers and their banks. The primary bank which provides almost all services to a customer is called their house bank in Germany (Behr and Guettler, 2007; Hummel, 2011). According to a recent study, 88 per cent of all SMEs indicated to have a house bank. For 63 per cent of them, the house bank is the most important provider of financial services. However, 52% intend to become more independent from the house bank (Becker et al., 2013). Another study evaluated how many house banks German SMEs have. This study found out that only one third of all SMEs have solely one house bank whereas around 60 per cent have two or three house banks. The number of house banks is positively correlated with the size of a firm (Hummel, 2011). This is in line with an elderly study about the number of house banks in Germany (Hackethal and Gleisner, 2006). These figures illustrate a close relationship between the house bank and the SMEs in Germany. However, they also indicate an increasing openness to expand the contacts to several house banks and an increasing competition between house banks.

The financial markets and therefore the corporate finance sector have undergone deep modifications within recent years. These modifications strongly affected the financing conditions for SMEs in Germany. Increased competition from globalization in the financial world, the introduction of Basel II and advanced information and communication technologies resulted in a higher risk-orientation when loan applications are assessed (Zimmermann, 2008; Schmidt and van Elkan, 2006; Reize, 2005). Moreover, banks have to be aware of their own ranking. To obtain a high grade they need to fulfill the requirements of the rating agencies (Schmidt and van Elkan, 2006). Hence, evaluation and management of potential risks have become increasingly important in assessing loan applications (Zimmermann, 2006). Consequently, banks have enhanced requirements regarding creditworthiness, transparency and contents of reporting systems (Schmidt and van Elkan, 2006; Zimmermann, 2006). To enable banks to more accurately measure the creditworthiness and the probability of default of a potential borrower, credit scoring systems in banks have become more important (Reize, 2005).

1.4 SME financing in Germany

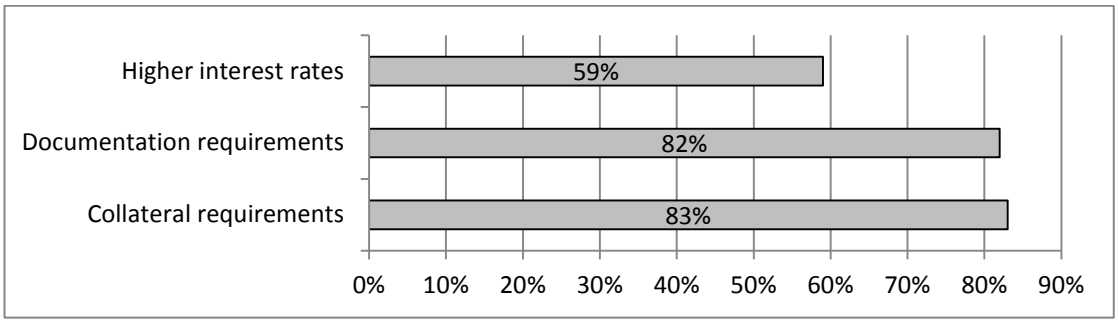
Besides internal financing, bank lending is by far the most important source of external finance for SMEs (Cressy, 2002; Hussain et al., 2006; Zimmermann, 2009; Tchouvakhina and Zimmermann, 2009; Le and Nguyen, 2009; Behr and Guettler, 2007; Reize, 2011). As Behr and Guettler (2007) stated, the relative importance of bank loans is negatively correlated with the size of the firms. Whereas larger, publicly listed firms have access to other external sources, smaller companies rely more on bank finance. Following the pecking order theory, owners or managers of SMEs give preference to financial options that will not affect their business control (Hussain et al., 2006; Petersen and Rajan, 1994).

In the German financial system, the bank orientation is quite distinct. Bank loans traditionally play a key role in financing businesses (Schmidt and van Elkan, 2006; Reize, 2011). Due to close relations between customers and their house banks in Germany bank managers often made credit decisions out of subjective appraisals of the borrower´s creditworthiness and business ideas. This increased debt finance in Germany (Fischl, 2006). Due to Basel II and the growing importance of using credit scoring systems to evaluate creditworthiness and risk credit decisions rely more on objective assessments. Considering the reliance on bank finance of SMEs it becomes obvious that SMEs are particularly affected by these changes (Schmidt and van Elkan, 2006).

This is demonstrated by the latest enterprise survey of reconstruction loan corporation (Kreditanstalt für Wiederaufbau)[1] which shows, that small enterprises perceive difficulties in obtaining bank loans. Around 54 per cent of all interviewed firms with an annual turnover below 1 million € stated to have suffered from credit rationing (Schwarz and Zimmermann, 2012). The main reasons for credit restrictions mentioned by those firms are shown in Figure 1.2 below:

[1]The annual survey contains enterprises of all sizes, sectors, legal forms, and regions and covers questions about banking relationship, financial conditions and financial practices. It is conducted in cooperation with 21 trade associations. 3,402 firms attended in 2012.

Figure 1.5: Main reasons for difficulties in obtaining bank loans
(multiple selection allowed)



Source: Own illustration, adopted from Schwarz and Zimmermann (2012), p. 17

Around 20 per cent of those firms indicated credit restrictions as main reasons for cancelling already planned investment projects (Schwarz and Zimmermann, 2012). This illustrates how credit restrictions might have impeded economic growth.[2]

Recent literature has shown that especially small firms are affected by credit rationing. SMEs report greater financing obstacles than larger firms. Moreover, the effect of financial constraints is more extensive than for large firms (Beck and Demirguc-Kunt, 2006; Beck et al., 2010). SMEs face special structural disadvantages when financing which will be explained in the following (Stefanovic, 2009).

Equity

Equity acts as an indicator for creditworthiness, financial stability and the ability to hedge risks. Due to Basel II, these qualities have gained more and more importance. Therefore the equity ratio (total equity/total assets) is of particular concern in credit assessments (Schmidt and van Elkan, 2006). A high equity ratio positively influences creditworthiness (Stefanovic, 2009) as it indicates to the bank that the borrow will be able to repay the loan (Coco, 2000). However, as Table 1.3 shows, the equity ratios of German SMEs are rather low (Creditreform, 2013)

Table 1.4: Equity ratios of German SMEs in spring 2013

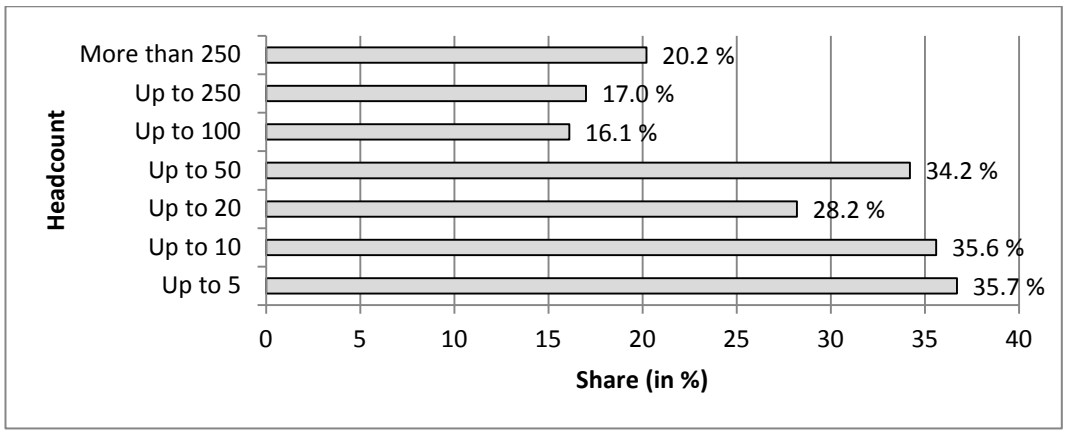
Equity ratios	**Share of all German SMEs**
Up to 10%	28.3%
Up to 20%	22.5%
Up to 30%	16.5%
More than 30%	32.8%

Source: Creditreform (2013)

[2] At this stage it is important to mention that the results of the survey reflect subjective estimations. It is no sufficient evidence for the existence of credit rationing as the actual reasons are not shown.

Smaller SMEs are more likely to show lower equity ratios. Figure 1.3 demonstrates this by presenting how many firms of each size have an equity ratio of up to 10 per cent.

Figure 1.6: Lowest equity ratio measured by headcount



Source: Creditreform (2012)

The use of external finance is fostered by the close relation between customer and house bank, taxes and bankruptcy law. The effect of Germany's financial structure on the fiscal health of SMEs is even more distinct than on bigger firms (Schmidt and van Elkan, 2006). This leads to relatively lower equity bases and comparatively higher debt ratios of SMEs (Zimmermann, 2009). Over the course of the implementation of Basel II, banks comprehensively adopted rating systems to value the risk and creditworthiness of their clients. In this context, the equity ratio is essential for the rating of a potential borrower. The rating itself is crucial for the decision about whether a loan is provided or not and which interest rate is established. Comparably low equity ratios of SMEs result in low credit scoring grades (Stefanovic, 2009). Therefore, a low equity ratio can be a reason for credit restriction.

Financial reporting

Typical for SMEs is their informational opacity (Berger and Udell, 1998; Ortiz-Molina and Penas, 2008). Following Berger and Udell (1998, p. 616), this is "…the most important characteristic defining small business finance". Attributable to their relatively small business size, SMEs often do not have the human and technical resources to allocate and govern their own reporting systems (Stefanovic, 2009). Many SMEs have no audited financial statements (Beck et al., 2010). For that reason they can hardly be monitored by rating agencies (Ortiz-Molina and Penas, 2008;

Berger and Udell, 1998; Behr and Guettler, 2007; Petersen and Rajan, 1994). As opposed to bigger firms which can show their soundness on the basis of an external rating, SMEs have fewer options to credibly prove their quality (Zimmermann, 2006; Petersen and Rajan, 1994). Moreover, the relevance of key financial figures has grown rapidly with Basel II and the increased use of own credit scoring systems in banks (Stefanovic, 2009; Zimmermann, 2007). Banks increasingly require the disclosure of financial figures (Schmidt and van Elkan, 2006). The difficulty for SMEs to convey their creditworthiness can lead to severe problems in obtaining bank loans.

Collateral

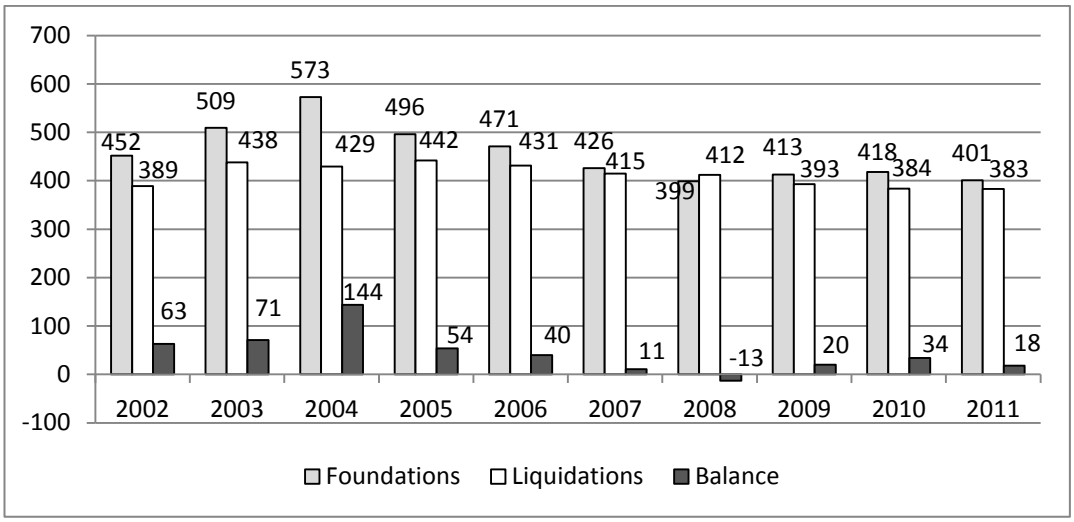
Collateral is often cited as an effective means to mitigate information problems (Stiglitz and Weiss, 1981; Besanko and Thakor, 1987; Bester, 1985; Berger and Udell, 1990). As mentioned earlier, SMEs are informationally opaque. For this reason, banks face serious challenges evaluating and assessing the potential risk related to a SME loan. Therefore, banks increasingly insist on the provision of collateral when granting loans to SMEs (Schmidt and van Elkan, 2006; Zimmermann, 2007). Although collateral cannot reduce the risk of default, it limits the loss for the lender (Stiglitz and Weiss, 1981; Berger and Udell, 1990; Stefanovic, 2009). To efficiently mitigate the potential loss of a lender the intrinsic value of pledged collateral is of particular importance. Furthermore, it must be sufficiently tradable. Especially in the early years, SMEs often do not have enough tangible assets to pledge as collateral (Harhoff and Körting, 1998; Berger and Udell, 1998; Columba et al., 2010). Collateral is considered to be a substitute for information (Berger and Udell, 1990; Stiglitz and Weiss, 1981; Boocock and Shariff, 2005). It is widely regarded to be an effective means to signal the quality of a borrower (Voordeckers and Steijvers, 2006; Coco, 2000; Colombo and Grilli, 2007). SMEs that cannot provide collateral in the right amount or quality are more often affected by credit restrictions (Schmidt and van Elkan, 2006; Voordeckers and Steijvers, 2006; Berger and Udell, 1998; Harhoff and Körting, 1998).

Start-ups and young firms

In 2011 an estimated 401,500 new firms were established (Günterberg, 2012). Considering that around 20% of all founders need external finance to establish their businesses the share of start-ups and young firms applying for bank loans is

considerably high (Stefanovic, 2009). Figure 1.4 below gives an overview about the number of foundations and liquidations in Germany between 2002 and 2011.

Figure 1.7: Foundations and liquidations 2002 - 2011 in Germany
(in thousands)



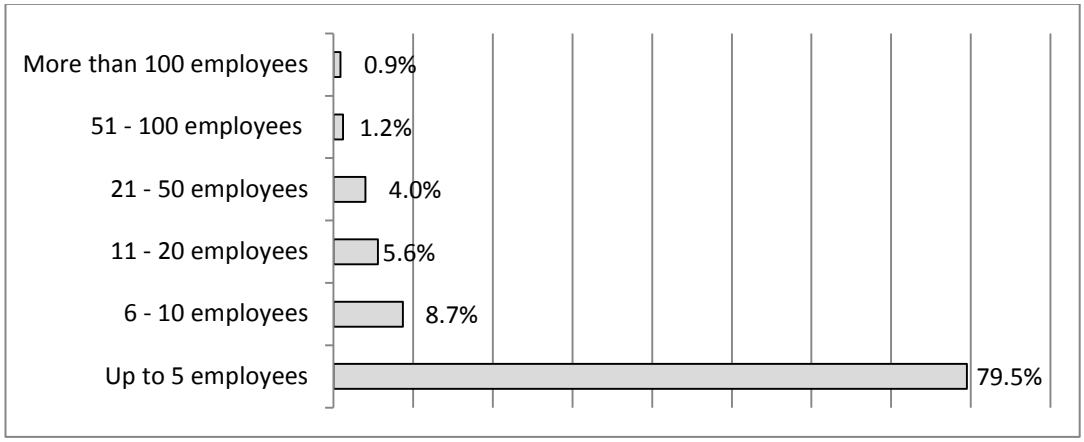
Source: Own illustration; adopted from Günterberg (2012)

Start-ups or young firms have no or only little credit history (Craig et al., 2008; Berger and Udell, 1998; Columba et al., 2010). As they often have no or only little track record, it is difficult to assess the trustworthiness and the competence of an SME´s management (Petersen and Rajan, 1994). Furthermore, investment projects of start-ups can hardly be monitored and evaluated by banks (Levenson and Willard, 2000). In that case, credit assessment can only depend on budget figures or subjective opinions (Zimmermann, 2006; Stefanovic, 2009). Under these conditions the future prospectus of the SME can hardly be validated. However, the future prospectus is an important basis for a profound credit assessment. Typically credit scoring systems heavily rely on key figures related to a business's past performance (Stefanovic, 2009). When this information is lacking, as it is for new businesses, banks tend to assess the riskiness of a borrower on a higher level than it actually is (Reize, 2005). Due to the increased risk sensitivity, start-ups and young firms face serious difficulties in obtaining bank loans until they have substantial tangible assets to pledge as collateral (Berger and Udell, 1998) to limit the risk undertaken by the bank (Boocock and Shariff, 2005).

Insolvency risk

Figure 1.4 above has demonstrated that the number of foundations of German SMEs experienced a high number of liquidations during the last decade. As Figure 1.5 illustrates, the insolvency risk is the most severe for small firms.

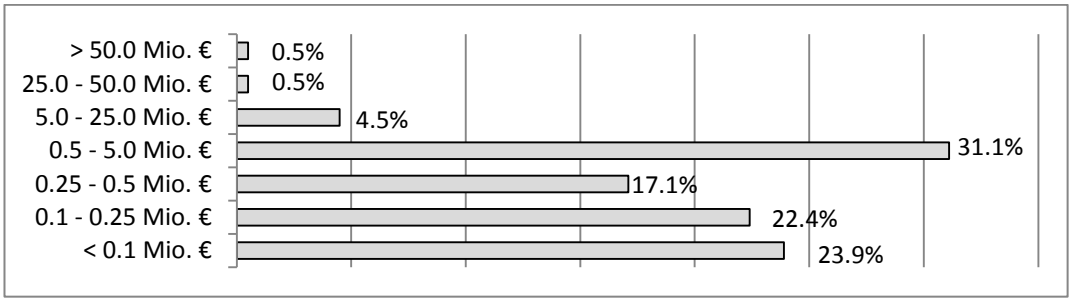
Figure 1.8: Insolvencies measured by headcount
(in per cent; first half of 2012)



Source: Own illustration, adopted from Creditreform (2012)

Measured by firm size, it becomes clear that smaller firms show a higher insolvency risk than bigger firms. Figure 1.6 illustrates the percentage of insolvencies of German firms during the first half year 2012.

Figure 1.9: Share of insolvencies measured by firm size
(in Mio. €)

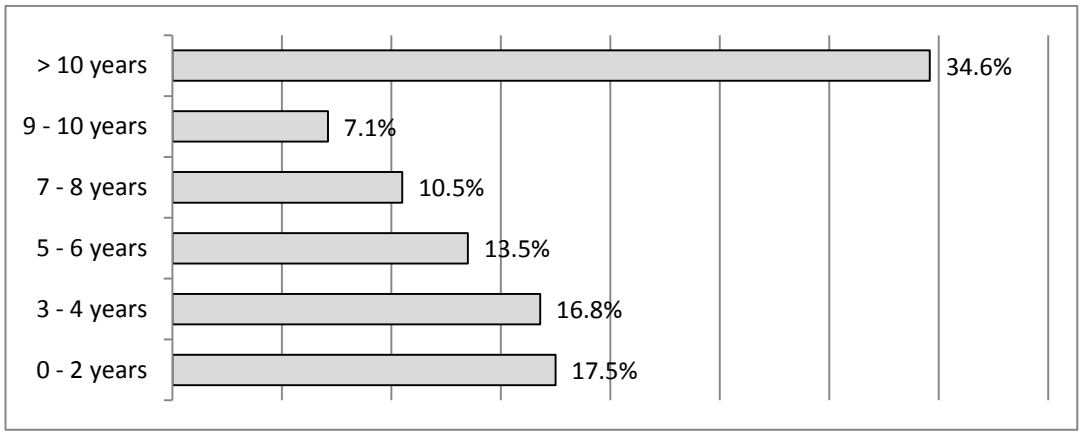


Source: Own illustration, adopted from Creditreform (2009a)

These figures are seen in multiple sources (Waschbusch and Straub, 2008; Gudger, 1998; Beck et al., 2010). SMEs are more vulnerable to economic distress and market changes. Many owners of SMEs are relatively inexperienced and often have no sufficient resources to survive an economic downturn (Gudger, 1998). Figure 1.7 below demonstrates that for the first ten years the age of a firm is negatively

correlated with its inherent risk and many firms cease trading at an early stage (Leeth and Scott, 1989; Cressy, 2006).

Figure 1.10: Share of insolvencies measured by firm age
(first half year 2012)



Source: Own illustration, adopted from Creditreform (2012)

These figures demonstrate the high default risk which can lead to certain reluctance in providing bank debt to SMEs.

Costs

The communication and information costs which arise before, during and after a credit agreement are so-called transaction costs (Schmidt and van Elkan, 2006). Credit assessments are characterized by a relatively high share of overhead costs. Compared with loans to large firms the average amount of SME loans is rather low. High costs in relation to low loan sizes will reduce the profitability of the lending banks (Bosse, 2009; Levitsky, 1997a; Riding et al., 2007; Beck et al., 2010). Due to the informational opaqueness of SMEs the costs for collecting information about the past and a SME´s future prospectus is relatively high and more difficult to obtain (Berger and Udell, 1995; Cressy, 2002; Parker, 2002; Zimmermann, 2007). Banks often perceive the acquisition of information about an potential borrower as unworthy investment when the loan size is relatively low (Zimmermann, 2007; Beck et al., 2010).

1.5 German guarantee banks

The structural disadvantages of SMEs described in Section 1.4 above can lead to credit rationing. According to Reize (2005), credit rationing describes the situation where the demand for bank loans of SMEs under given creditworthiness and given

interest rate exceeds the supply of loans. Under this definition, SMEs suffer credit rationing when at least one loan application (no matter for what reason) is denied (Reize, 2005). Some SMEs will get a bank loan while others will not. Even the interest charged does not ensure a complete balance of demand and supply (Schmidt and van Elkan, 2006; Cowling, 2010; Bester, 1985).

The existence of credit rationing for SMEs is the key justification for the establishment of Credit Guarantee Schemes worldwide (Cowling, 2010; Vogel and Adams, 1997; Craig et al., 2008; Craig et al., 2009). Credit Guarantee Schemes take on a certain amount of the risk of a SME loan and therefore make the loan possible for the firm. Although the central aim of these schemes is more or less the same in every country, the design and the mode of operation can differ. A more detailed overview about general characteristics of Credit Guarantee Schemes is presented in Section 2.1 below. Section 1.5 concentrates on the Credit Guarantee Scheme in Germany. Since the present research is focused on the Credit Guarantee Scheme in Germany which consists of the German guarantee banks, this section provides some background information which are considered to be important for a better understanding of the research and its outcomes.

Formation and development

The establishment of guarantee banks in Germany is strongly related to the emergency situation after World War II. Due to enormous reconstruction activities in the beginning of the 1950s the need for funding by the manufacturing industry was tremendous. The German Mittelstand in particular suffered from destroyed production facilities and commercial properties. Since most banks required a lien on property as a rule during that time, SMEs widely could not obtain bank finance. To facilitate the access to finance, so-called credit guarantee societies were established (Schmidt and van Elkan, 2006; Stefanovic, 2009; Schiereck, 2002). The first credit guarantee society was founded in Lower Saxony in 1953. It solely supported trade businesses. Following this example other credit guarantee societies were established in every federal state. Over the course of time, credit guarantee societies for commerce, gardening, manufacture, hotel and hospitality businesses were founded. As demand for sureties and guarantees steadily increased the specialization in certain manufacturing sectors were abandoned in most federal states during the 1990s. The different credit guarantee societies were merged. During the same time, due to the

German reunification, SMEs in Eastern Germany (the new federal states) were in a similar situation as the western federal states had been after World War II. As a consequence of the economic transformation process (change from a planning economy into a market economy) the demand for bank loans increased. However, SMEs did not have enough valuable assets to provide for collateral. This situation fostered the rapid establishment of a credit guarantee system in the new federal states. Today, every federal state in Germany has one institution to provide sureties and guarantees to SMEs[3] which generally trades under the term guarantee bank (Schmidt and van Elkan, 2006).

Objectives and target group

From the beginning, the main objective of guarantee banks was to undertake securities to collateralize bank loans to SMEs. Guarantee banks do not provide loans to SMEs. They provide guarantees or sureties. They take on the default liability for small firms with no or insufficient collateral that otherwise would not have obtained bank finance (Langer and Schiereck, 2002; Schiereck, 2002). The first requirements a firm has to fulfill to obtain a guarantee from a guarantee bank are the classification for SMEs corresponding to the definition of the European Union and the actual need for support to receive a bank loan. An actual need can arise for healthy firms with established business structures and given creditworthiness but without valuable securities or for start-ups and young firms without enough valuable assets to pledge for collateral. Moreover, the firm has to be engaged in one of the following business sectors: craft, trade, manufacturing, hotel industry, hospitality business or transport industry. Additionally, freelancer and provider of miscellaneous services and in some federal states farmer, gardener and fishermen fulfill the requirements to obtain a guarantee. The last prerequisite for obtaining a guarantee which should be mentioned is a viable investment project which is economically sound and promising. Guarantee banks make their own assessment about the borrower´s technical, personal and entrepreneurial qualifications. Furthermore they analyse the financial situation as well as the prospects concerning turnover and profit. They cooperate with chambers and organizations and voluntary employees from enterprises and the banking industry. These parties contribute mostly free evaluative reports to support the decision-making of the guarantee banks. This helps the guarantee bank make

[3]An exception is the federal state Bavaria which still has sector specific institutions whereby mergers are already aspired (Schmidt and van Elkan 2006).

decisions with up-to-date knowledge about sectors and markets. The additional assessment of an independent third party amounts to an advanced and detailed credit analysis (Schmidt and van Elkan, 2006).

The German guarantee banks mainly support SMEs in special situations. Guarantee banks concentrate their business on:

- start-ups,
- SMEs that grow faster than their equity,
- viable SMEs in high growth/high technology sector (dynamic firms),
- SMEs in new industrial sectors, and
- SMEs in turn-around situations which are only survivable with a risk-sharing partner.

These characteristics are interpreted as enhanced risk factors by the bank´s rating systems. This leads to credit refusal or very high loan interest rates. Firms in a situation mentioned above would probably fail without the risk adaption of the guarantee banks which enables them to obtain a bank loan with reasonable conditions (Verband Deutscher Bürgschaftsbanken, 2009).

Guarantee banks make no direct cash payments. The default liability of the guarantee bank reduces the default risk for the lender. To the lender, sureties and guarantees of guarantee banks are securities of first rank. This raises the creditworthiness of the borrower (Schmidt and van Elkan, 2006).

Sureties and guarantees

German guarantee banks mainly support SMEs by financing credit and equity. Therefore they provide SMEs with sureties and guarantees.

They provide guarantees for dormant equity holdings by venture capital companies. To make those investments possible, they overtake the principal part of the default risk. A guarantee is an intangible security for SMEs. It is an abstract liability which is not conditional to the primary debt (Schmidt and van Elkan, 2006).

Guarantee banks provide sureties to SMEs with no or insufficient collateral that otherwise cannot obtain bank loans. They take on the default liability for a certain percentage of the total loan amount. The maximum rate of a surety adds up to 80 per

cent of the overall loan amount and is limited to 1 million Euros (Verband Deutscher Bürgschaftsbanken, 2009). Sureties from the guarantee bank have a high security for the lenders. They reduce the bank´s risk by raising the creditworthiness of the borrower. Sureties of guarantee banks are modified-deficiency suretyships. They combine characteristics of an absolute and a deficiency suretyship. This means that guarantee banks abandon the benefit of discussion and settle their liabilities without waiting for legal enforcement. However, they only pay for proven defaults. The occurrence of a default is explicitly defined in the surety contract.

Sureties can be provided for start-ups and acquisitions, to finance growth and investments and working capital credits, whereas guarantees for redevelopment financing are excluded (Schmidt and van Elkan, 2006).

In 2011, German guarantee banks provided 7,282 sureties and guarantees with a volume of about 1,150 million Euros (Verband Deutscher Bürgschaftsbanken, 2012). These figures illustrate the tremendous importance of sureties.[4]

Characteristics and organization of German guarantee banks

German guarantee banks are special banks. Their business activity is limited to the provision of guarantees to SMEs. This means that German guarantee banks are no universal banks. According to section 1 of the Banking Act, guarantee banks are credit institutions. The Credit Guarantee Scheme in Germany is federally organized. Every one of the sixteen federal states in Germany has an autonomous guarantee bank. The organizational structure of different guarantee banks can slightly vary. These variations are politically as well as historically motivated. To prevent competition with each other, their activities are limited to their particular states (Schmidt and van Elkan, 2006; Stefanovic, 2009). They are organized in the Association of German Guarantee Banks. The association represents the interests of all guarantee banks in Germany and ensures a viable exchange of experiences (Stefanovic, 2009).

[4]In the following, sureties and guarantees of the German guarantee banks will be considered as one. In the international context there is no differentiation between sureties and guarantees. Credit Guarantee Schemes in other countries mostly solely provide what is known as surety in Germany. However, this is commonly termed *guarantee*. Henceforth, the unique indication *guarantee* will be used in this work as well.

All German guarantee banks are Limited Liability Companies. Following the Limited Liability Company Act they all have a general assembly and an executive board. The sponsors of the guarantee banks (professional economic organizations, financial institutions and insurance corporations) determine the company policy. The executive board is responsible for the operatiing side of the business. According to their constitution, all guarantee banks have a Bürgschaftsausschuss (loosely translated: guarantee committee). The most important task of this board is the approval of all guarantees proposed by the executive board. This means that no guarantee will be granted without the agreement of the guarantee board (Kramer, 2008; Schmidt and van Elkan, 2006).

Clearing and settlement

Before a SME applies for a guarantee, it commonly has asked a commercial bank for a loan. When the bank assessed the application and found out that the firm could not provide sufficient own collateral, the loan normally was not provided. To enable the firm to get access to finance in spite of this, commercial banks can initiate the contact to the guarantee bank in their region to bridge this gap by the provision of a guarantee from the guarantee bank. Together with the commercial bank, the borrower then applies for a guarantee. The bank forwards the application to the guarantee bank and adds its own comment concerning the project.

Besides this, it is also possible that a SME applies directly at the guarantee bank for a so-called ‘guarantee without bank’. This is mostly the case when the firm knows that it cannot provide sufficient valuable collateral in advance. In these cases the SME applies for a guarantee before asking a bank for a loan.

In each instance, the guarantee bank intensively assesses all applications by bringing in external consultants as mentioned above (Langer and Schiereck, 2002; Schmidt and van Elkan, 2006). Given that they approve the enquiry, they forward the application to the guarantee board. Once the guarantee board approves to the application the executive board makes their final decision.

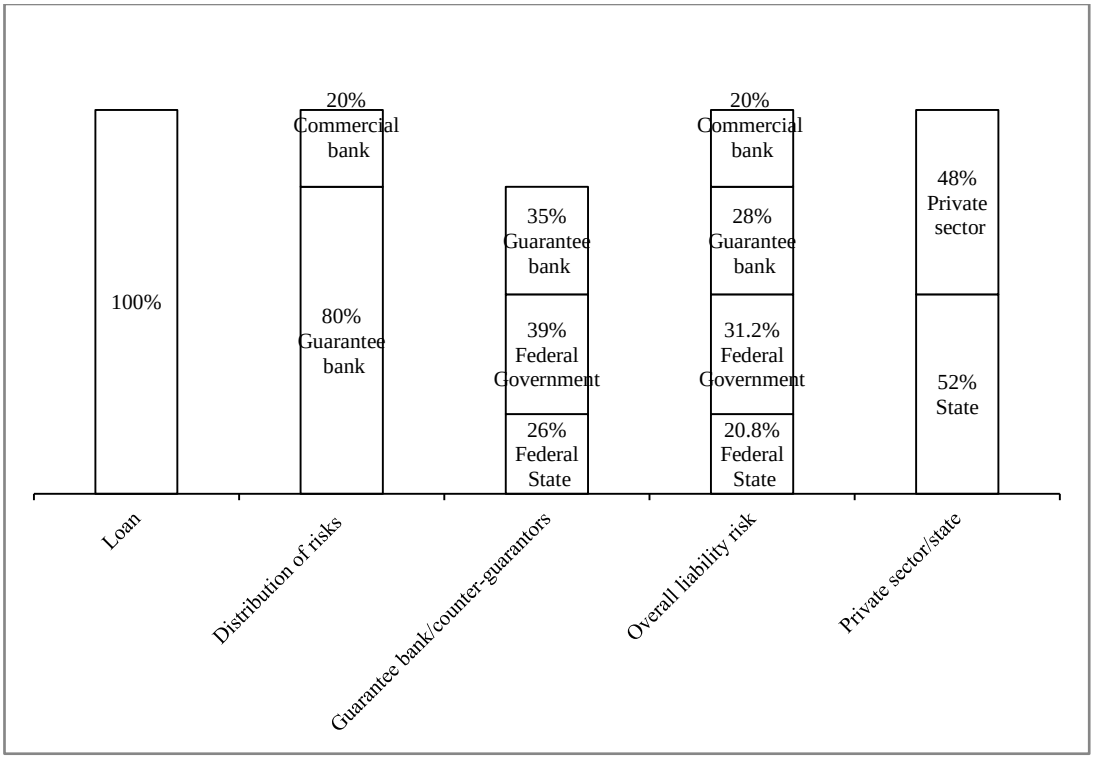
Even if a guarantee from a guarantee bank is provided for a bank loan, it is always the lending bank that is responsible for the credit control. The commercial bank is obliged to make regular reports to the guarantee bank. It has to inform the guarantee bank immediately about arising special circumstances and/or deteriorations in the

credit arrangement. This is a precondition for the payment by the guarantee bank in the case of a default. In the event of the borrower's insolvency, the bank has to resign the credit contract and requests the repayment of the outstanding amount. The bank informs the guarantee bank and declares the recourse of the guarantee. It determines the valuation of collateral and distributes the generated proceeds to the guarantee bank (Schmidt and van Elkan, 2006).

Financing and risk sharing

A guarantee from a German guarantee bank covers up to 80 per cent of the overall loan amount. As illustrated in Figure 1.8 below, this means that in the case of a guarantee of 80 per cent, the commercial bank covers the remaining 20 per cent of the risk. Due to counter-guarantees of the federal government and the particular federal states, guarantee banks have to bear only a part of the defaults in the context of their guarantees. The guarantee bank's share of default risk currently amounts to 35 per cent in the old states (20 per cent in the new states). The remaining 65 per cent (80 per cent) is covered by the federal government and the principal federal state (Schmidt and van Elkan, 2006; Nitsch and Kramer, 2010). Projected on the overall loan amount, the state covers altogether 52 per cent of the risk due to the provision of the counter guarantee. The reasons for the different shares in the new and old states are distinctly different default probabilities for commercial loans (Stefanovic, 2009). Figure 1.8 provides a detailed overview of the distribution of risks in the old states.

Figure 1.11: Distribution of risk when guarantee is provided



Source: Own illustration, adopted from Stefanovic (2009)

The counter guarantees are of enormous importance for the guarantee banks. They reduce their need for equity. Therefore German guarantee banks build up a high volume of guarantees with comparatively low equity. Additional sources of funding for guarantee banks include the cost of commissions and fees for guarantees. These sources charge a one-time arrangement fee of about 1.0-1.5 per cent of the guarantee amount which has to be paid by the SMEs. Current commissions, which are comparable to an annual interest payment, usually account for 1.0 per cent of the guarantee amount.

German guarantee banks additionally obtain loans out of the European Recovery Program. These loans are available at reduced interest rates. The maximum amount of those loans available is limited up to 12 per cent of the overall amount of guarantees (Schmidt and van Elkan, 2006; Schiereck, 2002).

Furthermore, German guarantee banks are not required to pay corporate tax and trade tax. This relief is based on the condition that assets and net incomes are used solely to provide additional guarantees (Schmidt and van Elkan, 2006; Stefanovic, 2009; Langer and Schiereck, 2002).

1.6 Research aim and objectives

The existence of guarantee banks in Germany means a government interference which can only be justified when the allocation of SME loans can really be improved. To test whether the access to bank loans for SMEs can be improved is the aim of the present research. For each guarantee provided, the majority of the risk is covered by the state and therefore indirectly by every German taxpayer. Therefore, it is important to continually evaluate whether guarantees are solely provided for viable and promising business projects. It is important to prevent the creation of moral hazard on the side of the lenders as well as on the side of the borrowers by covering a certain amount of the initial risk when a guarantee is allocated. This could result in supporting firms that normally quite rightly would not have obtained a bank loan because of the high risk. If this is the case, the existence of guarantee banks, the risk taking by the state and the related costs will not be justifiable. Moreover, it is important to evaluate whether the provision of a guarantee from a guarantee bank can mitigate credit restrictions. The mitigation of credit restrictions can be observed at two points: the first time is mitigation of credit restrictions at the time the SME initially applies for a loan. The second time is after a guarantee bank has provided a guarantee and if access to bank loans can be facilitated in a sustainable way. This evaluation process seeks to determine whether SMEs that would not have obtained the initial loan without the guarantee from the guarantee bank can graduate to borrowers without guarantee over the course of time. If so, this could provide a justification for the existence of guarantee banks and for the risk coverage provided by the state.

The literature review has demonstrated that this has not been tested so far. Existing research about German guarantee banks is mainly concentrated on macroeconomic impacts (Schmidt and van Elkan, 2006; Schmidt and van Elkan, 2010) or is more or less simply literature-based and conceptual (Nitsch and Kramer, 2010; Schiereck, 2002). Regarding literature about Credit Guarantee Schemes in other countries, most studies are concentrated on the ability to provide additional loans to SMEs (Cowling, 2010; Zecchini and Ventura, 2009) or the macroeconomic impacts (Bradshaw, 2002; Oh et al., 2009). However, some literature exists which provides a suitable research approach to test whether guarantee banks achieve the aims described above. This research is concentrated on the ability of Credit Guarantee Schemes to alter the

lending behaviour by creating learning on the side of the lending banks (Green, 2003; Craig et al., 2008). The main weakness of the existing literature is that it is mainly conceptual. However, it provides the basis for creating the framework of the present research. According to the literature, Credit Guarantee Schemes stimulate the exchange of information between the SMEs and the lending banks. Information plays a crucial role in bank lending. One severe weakness of many SMEs is their informational opaqueness (Berger and Udell, 1998). If the provision of a guarantee from the guarantee bank results in a reduction of information asymmetries between the lending banks and the borrowers, this might reduce credit restrictions in a sustainable way. To foster the creation of information, close lending relationships are expected to be helpful (Petersen and Rajan, 1994; Harhoff and Körting, 1998). Consequently, the question occurs of whether the provision of a guarantee from a guarantee bank has any influence on the relationship between the SME and the lending bank. Based on these thoughts, the research objective is as follows:

Research objectives:

To reveal whether the provision of a guarantee from a German guarantee bank can initiate a learning process on the side of the commercial banks which helps to mitigate existing information asymmetries concerning SMEs, supports the building of a long-term customer-bank relationship and helps to overcome credit restrictions.

To test this, several research questions have been created. The first research question examines the direct impact on the access to bank loans for SMEs when initially applying for a bank loan. It tries to evaluate which SMEs need a guarantee to obtain a loan and why. The first research question is as follows:

Research question 1:

For what reason and in which situation are guarantees from the guarantee bank important for the provision of loans to SMEs?

The provision of a guarantee from a guarantee bank builds the basis for creating a learning effect on the commercial bank. Due to the guarantee, the loan can generally be provided. This is the precondition for obtaining the opportunity to collect information about the SME and reducing information asymmetries. The second research question deals exactly with these factors:

Research question 2:

Can the provision of a guarantee from a guarantee bank help to reduce information asymmetries between the lending bank and the borrower?

One aim of the research is to find out whether SMEs that once needed a guarantee from a guarantee bank for obtaining a bank loan can graduate to borrowers without guarantees over the course of time. This means that these firms would not need the support of the guarantee bank when applying for another loan at a later date. Therefore, a more productive flow of information gets created between the commercial bank and the SME. The information flow between the guarantee bank and the SME would not lead to a reduction of the relevant information asymmetries and a successful loan application without the help of the guarantee bank. This is the reason why the research is solely concentrated on the reduction of information asymmetries between commercial banks and SMEs.

A closer and more intense contact between the commercial bank and the SME is often considered to reduce information asymmetries and create better access to bank loans. Research question three is concentrated on the improvement of the bank-borrower relationship caused by the provision of a guarantee from a guarantee bank:

Research question 3:

Has a new lending relationship been created due to the provision of the loan with guarantee?

Finally, the question is whether SMEs that would not have obtained a bank loan without the existence of a guarantee bank have taken the opportunity to create a lending relationship, reduce information asymmetries and enhance their access to bank lending in a sustainable way. This is addressed in the fourth and last research question:

Research question 4:

Do German guarantee banks help to overcome credit restrictions?

At this stage it is important to notice that the guarantee bank can only put in operation the above mentioned processes. The provision of the guarantee is expected

to build the precondition for the provision of the bank loan. The reduction of information asymmetries, the creation of a lending relationship and the reduction of credit restrictions in a sustainable way take place between the commercial bank and the SME.

1.7 Thesis structure

This section provides a brief overview about the structure of the present PhD thesis.

Chapter 1: Introduction

The first chapter provides the main definitions of SMEs and highlights the high importance of SMEs which act as the engine of economic growth in Germany. However, this chapter also illustrates that SMEs often only have limited access to bank loans. Followed by an introduction about the German banking system and the competition among German banks, reasons for the restricted access to bank finance are discussed. These reasons can be existing information asymmetries, a lack of valuable collateral or higher costs related to SMEs loans. To facilitate the access to bank lending for SMEs is the main aim of guarantee banks in Germany. This chapter provides important background about the objectives and the target groups of guarantee banks, the organisational structure, financing and risk sharing. Guarantee banks were introduced to provide guarantees for SMEs that would not have received a bank loan otherwise since these guarantees act as collateral to the lending bank. The present research seeks to evaluate whether guarantee banks achieve the aim to mitigate credit restrictions for SMEs. Therefore, Chapter 3 concludes with a summary of the research aim and objectives of the present thesis.

Chapter 2: Literature review

Chapter 2 starts with presenting the most important literature about Credit Guarantee Schemes worldwide as well as literature about the German guarantee banks. It sums up the core topics within the research field of Credit Guarantee Schemes which are: the provision of additional lending, macroeconomic impacts and the ability to alter the lending behaviour of banks. Existing literature about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks is only conceptual. Therefore, it builds the basis for the present investigation. To provide a clear understanding about how the lending behaviour might be altered, related literature

about market imperfections, collateral in bank lending, and lending relationships is presented. Out of the reviewed literature, a framework is deduced which illustrates the expected learning process and the key factors that are expected to influence the process. It is assumed that the provision of a guarantee lowers the probability of default, bridges the gap of missing collateral which substitutes information asymmetries and enhances the profit of the lender. These mechanisms allow the provision of a loan to a SME in the first place. As a consequence of the loan provision, learning will take place if information asymmetries can be reduced and lending relationships can be created. The assumed results of the learning process are the immediate mitigation of credit restrictions as well as the mitigation of credit restrictions in a sustainable way. According to this framework, research questions and propositions are presented in the end of Chapter 2.

Chapter 3: Research methodology and design

Chapter 3 discusses the research methodology of the thesis. It explains the research methods that have been applied to generate new data. Since quantitative as well as qualitative research methods are applied, the present research follows a mixed methods approach.

To evaluate SMEs that received a guarantee from the guarantee bank a web survey was conducted to reach a relatively large number of respondents within a short period of time and ensure the highest anonymity possible. Chapter 3 provides information about the contents of the survey and about how it was pilot tested. It illustrates the distribution of the survey and provides details about the sample and the time frame of the investigation. Moreover, it gives explanation about the methods used for data analysis.

Semi-structured interviews with bank managers were conducted to learn about their thinking and behaviour in SME lending and the reasons for including a guarantee from the guarantee bank in a bank loan. Chapter 3 explains in detail why this approach is considered being suitable and how the interviews were piloted. Additionally, it provides details about the analysis of the interviews.

Chapter 4: Survey results

Chapter 4 presents the quantitative results of the web survey. The survey has been sent out in spring 2011 to 952 SMEs that have received a guarantee from guarantee bank Hesse between 2003 and 2008. Overall 157 responses have been evaluated (response rate: 16.49%).

Chapter 4 starts with providing an overview about the main demographic characteristics of the sample by presenting frequency distributions. Moreover, it gives prove of the accurate representstion of the respondents.

The results of the web survey were mainly analysed by conducting cross tabulation and chi-square test. The analyses follow the logical order of the research questions and propositions. In addition, a hierarchical cluster analysis was conducted. The analysis ended in a four cluster solution differentiating respondents according to the duration and the intensity of the existing relationship with the lending bank. The analyses of the web survey confirmed the high significance of guarantees from the guarantee bank to make available bank loans to SMEs. Moreover, the results demonstrated that information asymmetries can be mitigated and lending relationships can be created.

Chapter 5: Interview results

Chapter 5 contains the answers from the overall 10 semi-structured interviews that were conducted with bank managers engaged in SME financing. The interviews were conducted between January and April 2012. The chapter starts with a detailed description of the interviewees. To ensure anonymity, all interviewees obtained a number. This number is highlighted within the section whenever a statement from that source is quoted.

The qualitative analysis, again, follows the logical order of the propositions. When appropriate, the distribution of the answers is highlighted in a frequency table. This is followed by discussing the answers and linking them to the research proposition. Meaningful statements are cited to underline and illustrate the analyses.

The interviews revealed new aspects within the expected learning process: the meaning of cross-selling and the support of the region. Especially for banks operating in a limited area, guarantees from the guarantee bank often enable the

provision of a loan in the first place. Additionally, the results confirmed that information asymmetries can be reduced, lending relationships can be created and the expected learning effect can take place.

Chapter 6: Merging survey and interview results

This chapter merges the quantitative and the qualitative results. It starts with presenting a table linking the research questions and propositions to the quantitative and qualitative findings. This table provides a compressed overview about the results.

For some propositions, the results of the semi-structured interviews differ from the results of the web survey. For instance, the answers of the SMEs demonstrated that information is provided more regularly by borrowers that obtained a loan including a guarantee. However, the results of the semi-structured interviews also demonstrated that this often is not directly related to the guarantee. Moreover, the interviewees stated that a more regular provision of information not necessarily reduces information asymmetries.

Similar results were found in analysing the significance of guarantees for loan provisions, for example. SMEs as well as interviewees confirmed that the guarantees were crucial for obtaining the bank loans.

According to the research questions and propositions, the table is followed by illustrations of the results of the web survey as well as of the semi-structured interviews. This allows a detailed analysis about similarities and differences. In the end of each discussion, a final statement about whether a proposition can be confirmed or has to be refused is made.

Chapter 7: Conclusions and recommendations

Based on the merging of the results in Chapter 6 final conclusions about the ability of the guarantee bank to alter the lending behavior are made. It contains a clear illustration about confirming results, new or additional findings and limitations for each proposition. It demonstrates that most assumptions of the initial framework about the learning process can be confirmed by the research findings. Information asymmetries can be reduced, lending relationships can be created and credit restrictions can be reduced immediately. However, there are also some rejections and

additional findings which result in adjustments of the overall framework. The meaning of cross-selling and the support of the region, for example, had to be included into the initial framework. Within this chapter the final conclusion is drawn that guarantee banks are beneficial instruments to improve the access to bank loans for SMEs. The provision of guarantees from the guarantee bank can initiate a learning process which helps to overcome main reasons for credit restrictions like information asymmetries and the lack of collateral. These findings provide justification for the existence of guarantee banks. However, the chapter also highlights the limitations of the present research. For instance, it was not achieved to evaluate whether guarantee banks can mitigate credit restriction in a sustainable manner. Consequently, this chapter also provides practical implications for further research.

2 Literature review

The literature review builds the basis for the overall research aim and objective of the present research. This section contains the main literature about Credit Guarantee Schemes worldwide as well as existing literature about German guarantee banks. The fundamental concept of the research is based on this literature. Moreover, this literature illustrates the central research gap to be filled. To fully understand the wider context of the research, literature about market imperfections, the role of collateral in bank lending and lending relationships is provided. This literature is important to comprehend the overall aim of the research. Out of the cited literature, a framework about an expected process of learning on the commercial banks' side is derived which is anticipated to take place after a guarantee from a guarantee bank is provided. To test whether this process really can be initiated by the provision of guarantees from a guarantee bank is the aim of the present research. The concrete research aim, objectives and propositions that shall be tested are presented in the end of this section.

2.1 Credit Guarantee Schemes: An overview

Credit Guarantee Schemes (CGS) are a popular means of policy to support SME finance across the globe (Cowling and Mitchell, 2003; Beck et al., 2010). More than 2,000 schemes exist in nearly 100 countries. While most schemes in Europe were implemented in the 19th and early 20th century, in developing and emerging countries the first guarantee schemes emerged during the late 20th century (Green, 2003).

Although all schemes worldwide have in common that they seek to expand access to bank loans for SMEs, a wide variety of organizational features do exist (Honohan, 2010; Beck et al., 2010). Regarding the corporate structure of Credit Guarantee Schemes, three main types can be distinguished: Mutual Guarantee Associations, Publicly Operated National Schemes, and Corporate Associations. In Mutual Guarantee Associations, firms with restricted access to bank finance form a private society with the objective to collectively provide guarantees to each other. This can facilitate the access to bank lending since the acceptance of a joint responsibility acts as a positive signal for the creditworthiness of the potential borrower. Examples for Mutual Guarantee Associations are the Credit Guarantee Scheme in Italy (Columba et al., 2010) or in France. Publicly Operated National Schemes are commonly

introduced by the government. The schemes are created to support firms with limited access to bank finance (for example SMEs, firms from special industrial sectors or firms run by women). The majority of all Credit Guarantee Schemes in the world is publicly operated. Those schemes can be managed by the government or by private institutions. Corporate Associations are mostly operated by the private sector like entrepreneurs, chambers of commerce or banks. These schemes are funded by the initial capital the private owners have provided or by public sources. Examples for Corporate Associations are the schemes in Greece or Romania (Beck et al., 2010; Green, 2003; Camino and Cardone, 1999).

Regarding the risk management of Credit Guarantee Schemes, one crucial point is the respective risk coverage (Riding et al., 2007; Levitsky, 1993). It has to be high enough to induce banks to advise borrowers to apply for a guarantee (Green, 2003). In reverse, a high coverage may reduce the incentives of banks to conscientiously assess the creditworthiness of the borrower or to provide loans for high-risk projects that otherwise would not have been funded. This is known as moral hazard on the part of the lending banks (Uesugi et al., 2010; Levitsky, 1993). In addition, moral hazard can also occur on the part of the borrower. A high coverage may lead the borrower to shift to riskier projects as there is no or only minimal threat of a default. Both situations may result in an increase of loan defaults (Levitsky, 1993; Green, 2003). An evaluation of 76 Credit Guarantee Schemes worldwide undertaken by Beck et al. (2010) demonstrated that the coverage rates ranged from 100 per cent of the outstanding loan amount to a maximum of 50 per cent. The median coverage rate of all Credit Guarantee Schemes under investigation was 80 per cent. To provide some concrete examples: a Credit Guarantee Scheme that covers 100 per cent of the outstanding loan amount is the one in Japan (Uesugi et al., 2010), the schemes in Austria or Hungary cover up to 80 per cent, the scheme in Finland covers between 50 and 75 per cent, and the scheme in Italy covers 50 per cent of the outstanding loan amount (European Mutual Guarantee Association, 2003). Another aspect of the risk management is the guarantee mechanism. It can be distinguished between Credit Guarantee Schemes that guarantee loan portfolios (known as global approach) and those that guarantee individual loans (known as selective approach). In the selective approach, the borrower applies for a loan at a bank. The bank assesses the application and decides that the provision of a guarantee is required for the provision of the loan. In a next step, the lender or the borrower applies for a guarantee from the

guarantee scheme. It may also be that the borrower himself applies for a guarantee from the guarantee scheme before contacting the bank and asking for the loan. In either case, the guarantee scheme has to assess every application before making the decision about providing a guarantee and before the bank can make a decision about providing a loan. When the global approach is applied, lenders can include guarantees for loans to borrowers of predefined categories without contacting the guarantee scheme in advance. The selective approach requires closer contact. Moreover, individual assessments require more time and raise the overall costs compared to the portfolio approach. However, it also reduces the risk of moral hazard on the part of the lending bank and, therefore, reduces costs of default (Beck et al., 2010; Green, 2003). According to Beck et al. (2010) the majority of all Credit Guarantee Schemes applies the selective approach. The schemes do not necessarily have to decide for one of these approaches. The scheme of the Czech Republic for example applies both, the selective as well as the portfolio approach (European Mutual Guarantee Association, 2010).

Concerning the guarantee mechanism, there are direct guarantees and counter- or co-guarantees. When a Credit Guarantee Scheme provides a direct guarantee to a bank, it directly covers the outstanding loan amount. A co- or counter-guarantee covers a guarantee of the main guarantor. Only if the main guarantor has become insolvent, would the co-guarantor step in (Beck et al., 2010). A combination of both mechanisms is conceivable. The German guarantee banks, for example, provide direct guarantees to the lenders. A part of these guarantees is covered by a counter-guarantee of the federal government and the particular state (see Section 1.5).

Since fees are the main source of income for guarantee schemes, the decision about fees is crucial. Fees can be charged annually or up-front, depending on the underlying loan as well as on the amount of guarantee provided (Green, 2003; Beck et al., 2010). The scheme in Austria charges an annual premium between 0.5 and 1.0 per cent as well as non-recurrent commission of 0.5 per cent of the guarantee amount for the assessment. In Hungary, the fee depends on the duration of the guarantee provided and ranges between 0.25 and 0.75 per cent of the overall guarantee amount. The scheme in Lithuania requires a single premium of 5.0 per cent (European Mutual Guarantee Association, 2003). These figures illustrate the wide range of pricing of the different schemes. Additionally, it has to be decided who has to pay the fees: the

borrower, which is most often the case, or the lending bank which mostly passes the fees on to the borrower in the end (Beck et al., 2010). Since fees have to cover costs of default, these costs need to be evaluated regularly and thoroughly. Moreover, the circumstances under which a claim can be made should always be specified (Green, 2003). Since not all borrowers that receive a guarantee will default, a given fund can be used to lend an even larger amount. The ratio of the total outstanding guarantees to the amount of the guarantee fund is called 'leverage.' Achieving a high leverage allows a scheme to spread fixed overhead costs over more guarantees. Average costs can be reduced, economies of scale can arise and risk can better be diversified. Since these positive effects hold up only to a certain level, it is advisable to define a maximum level of leverage. To be accepted by the lenders, guarantees have to be perceived as liquid and safe securities (Green, 2003). This requires a certain degree of regulation. According to Green (2003), guarantee schemes with financial institution status are therefore taken more seriously by banks.

There are also some organizational and operational issues that have to be considered during the design phase of a Credit Guarantee Scheme. To ensure an effective implementation and ongoing viability, government support and sufficient starting capital are essential. Several types of funding like direct budgetary appropriations, equity or lump-sum payments are possible. As income from fees is often insufficient to cover the costs of administration and defaults, it is beneficial to have a certain endowment that can be invested. The investment provides a source of income that could prevent bankruptcy. To reduce dependency, it should be avoided that all funding is exclusively provided by government and/or one donor. Therefore, contributions from business associations, banks and/or other private sources should be pursued. Staff have to be qualified in assessing and approving applications, monitoring guaranteed loans, and processing and reviewing claims (Green, 2003). Moreover, the general criteria for being eligible to obtain a guarantee have to be determined whereas many schemes focus on certain regions and specific types of enterprises within this region (Honohan, 2010; Green, 2003). For example, German guarantee banks concentrate their business on a single federal state within Germany. Moreover, it has to be decided, which kinds of financial instruments can be guaranteed (e.g. working capital, funds for investments) (Green, 2003; Riding et al., 2007).

2.2 Existing research about Credit Guarantee Schemes

The intensity of existing research about the efficacy of various Credit Guarantee Schemes worldwide and their impact on SME lending varies widely. While schemes in some countries were objects of several studies (e.g. the SBA loan guarantee program of the USA, the U.K. Small Firms Loan Guarantee Scheme), there is little investigation of schemes in other countries (e.g. Germany, Spain). The lack of studies is mainly due to methodological problems, restricted access to adequate data and high costs (Meyer and Nagarajan, 1996). Nevertheless, it is important to monitor the efficacy of Credit Guarantee Schemes and their impact on lenders and borrowers. Research findings may help to improve the schemes' impact on SME access to finance by developing recommendations.

The establishment of Credit Guarantee Schemes pursues special goals. The aim most cited is to provide additional finance by expanding the volume of lending to SMEs (Riding et al., 2007; Zecchini and Ventura, 2009). Since SMEs need finance to expand or establish a business, an increase in bank lending is considered to be connected to an increase in employment. Moreover, this is related to an increase in tax revenues from the employees and the SMEs (Riding et al., 2007; Bradshaw, 2002). Bradshaw (2002) also mentioned that fostering SMEs could augment export services within an economy. Since Credit Guarantee Schemes are useful tools to extend the relationship between a bank and its customer or to generate new customers, they are also thought to have a positive impact on the bank's profits (Riding et al., 2007).

The following sections will provide an overview of existing literature about Credit Guarantee Schemes. Section 2.2.1 contains the main literature about the ability of the schemes to provide additional lending to SMEs. Section 2.2.2 illustrates the main studies that tried to evaluate the macroeconomic impact of the schemes. Section 2.2.3 contains the literature about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks and Section 2.2.4 presents further literature about the guarantee scheme in Germany. At the beginning of each section, a short table is presented that gives an overview about author(s) and research methods, the research topic and the key findings. Subsequently, each study will be explained in more detail and inherent weaknesses will be discussed. Section 2.2.5 provides an interim

conclusion about the existing literature directly concerned with Credit Guarantee Schemes.

2.2.1 Provision of additional lending

Many existing studies about Credit Guarantee Schemes analyse the extent to which those schemes provide loans to SMEs that otherwise would not have been provided. The ability to provide additional loans is called 'additionality' in Europe and the UK and 'incrementality' in North America (Riding et al., 2007). The assumption that additionality is the main evidence to prove the efficacy of Credit Guarantee Schemes is widespread. It is considered as the one rationale for the implementation of guarantee schemes (Levitsky, 1997a; Boocock and Shariff, 2005; Benavides and Huidobro, 2008; Riding et al., 2007). While some studies exclusively measure whether the schemes augment the number or amount of loans to SMEs (financial additionality) other studies distinguish between financial additionality and economic additionality. Economic additionality means the increase of sales, employment, profits, etc. and will be considered under the aspect of macroeconomic impacts in the following section. Table 2.1 below illustrates that most existing studies confirm the ability of Credit Guarantee Schemes to provide additional lending.

Table 2.1: Literature summary about additionality

Details	Research	Key findings
Authors: Boocock, Shariff (2005) CGS: New Principal Guarantee Scheme (NPGS), Malaysia Sample: 92 firms (postal survey), 15 semi-structured interviews, case studies Methods: Logistic regression Response rate: 12.3%	Question: Is it possible for NPGS to generate financial and economic additionality without putting the financial resources of the Corporation under undue strain and/or jeopardizing its relationship with the participating financial institutions?	- Scheme failed to meet all the objectives sought by the corporation - There were a number of positive outcomes (especially in relation to economic additionality) - But baseline financial additionality was below average, there were high rates of default and the lenders bore a substantial portion of losses incurred
Author: Cowling (2010) CGS: Small Firm Loan Guarantee Scheme (SFLGS), UK Sample: 27,331 loan contract, period of time: 1993 – 1998 Methods: Regression analysis	Question: Has the existence of a loan guarantee scheme fulfilled its primary objective of alleviating capital constraints to smaller firms?	- Credit rationing for SMEs in the UK were not confirmed. - However, there was a pool of SMEs that, due to informational problems, will always find it more difficult to raise funds from the credit market when the macroeconomic conditions are worsening, even when collateral is available - SFLGS broadly fulfilled its primary objective

Table 2.1 (continued)

Details	Research	Key findings
Authors: Riding, Madill, Haines (2007) CGS: Canada Small Business Financing Sample: Data from 2001 survey of Statistics Canada (overall 88 firms) Methods: Logistic regression	Hypothesis 1: - It is not possible to measure additionality with a known degree of precision Hypothesis 2: - No additionality exists in the guarantee program	- Hypothesis 1 was rejected by the methodological approach of this paper - The empirical study found some proof of additionality
Authors: Zecchini, Ventura (2009) CGS: State-funded guarantee scheme, Italy Sample: Data from AIDA balance sheet data bank (overall 11,261 firms) Methods: Econometric tests, regression analysis	Question: Can the Italian guarantee scheme increase the access to bank loans and reduce borrowing costs for SMEs?	A positive impact of the Italian guarantee scheme on SME lending was confirmed.

One important argument has to be considered in this context: the difficulties of measuring financial additionality accurately. This is mostly due to the fact that different forms of additionality can be identified. Besides the basic definition of providing additional loans, additionality can be defined as providing loans on a more timely basis, providing loans on more favourable terms, supplying a broader financing package for SMEs or the improving of a bank-borrower relationship (Meyer and Nagarajan, 1996). Moreover, it cannot be excluded that lenders use guarantee schemes to shift distressed loans into a guaranteed portfolio. In these cases, lenders have already provided loans to SMEs and merely use the guarantee scheme to reduce their risk. If they have been willing to take on the risk in the absence of the scheme, this behaviour would affect the measurement of additionality negatively (Riding et al., 2007). It becomes clear that it is not possible to precisely assess what lenders would have done without the existence of a guarantee scheme. Therefore, additionality cannot be proven with certainty.

This is exactly what Boocock and Shariff (2005) pointed out in their study measuring the ability of the Malaysian Credit Guarantee Scheme to provide additional lending. The authors contacted 800 firms that received guarantees from the New Principal

Guarantee Scheme in Malaysia to answer a postal questionnaire wherefrom 92 firms responded (response rate: 12.3%). In addition, they conducted 15 semi-structured interviews based on a case study. Even though they argued that it is "…almost impossible to establish 'definitive' measures of additionality…" (Boocock and Shariff 2005, p. 427), they gave some evidence that the analysed scheme failed to meet the objective to provide financial additionality without straining its financial resources or jeopardizing the relationship with participating banks since their results demonstrated high rates of default.

This is something Cowling (2010) referred to as type 1 error related to Credit Guarantee Schemes. This means that the initial decision to not provide a loan to a SME turns out to be correct. In this respect the central objective of Credit Guarantee Schemes is to prevent type 2 errors. Type 2 errors occur when SMEs are credit rationed that can successfully repay their loans (Astebro and Bernhardt, 1999; Cowling, 2010). In his article, Cowling (2010) analysed overall 27,331 loan contracts issued within the years 1993 to 1998 under the UK Small Firms Loan Guarantee Scheme. The data set of the analysis included only firms that had already applied for all other potential sources to get a loan before applying for the guarantee from the UK Small Firms Loan Guarantee Scheme. Therefore, these firms would have been credit rationed without the scheme. Additionally, the data set comprised information about ex post loan defaults of the supported firms. The data analyses revealed that 2 per cent of all loans ended in default. Cowling (2010) concluded that the UK scheme indeed provides additional loans to SMEs. This leads him to the conclusion that the scheme has fulfilled its primary objective. However, the ex post loan defaults have demonstrated the existence of type 1 errors.

To overcome the problem of measuring additionality, Riding et al. (2007) for the first time created a model which enabled them to predict the lending decision outcome if the Credit Guarantee Scheme in Canada had not been available. The authors got access to data from Statistics Canada of more than 19,000 owners of SMEs that answered a large scale survey about their financial experiences within the year 2000. The survey was conducted in 2001. Riding et al. (2007) derived a statistical model resembling a credit scoring model based on loan decisions of SMEs that did not need a guarantee to obtain the loan (overall 202 loans). According to that model they scored a sample of those firms that received a guarantee (overall 88 loans). This

allowed them to predict the lending decisions for these firms if the Credit Guarantee Scheme would not have existed. Out of the 88 loans that received a guarantee, 71 (80 per cent) were classified as being denied without the existence of the Credit Guarantee Scheme. This proves the ability of the scheme to provide additional lending. The authors themselves interpose that the study is limited to the most narrowly defined aspect of additionality. Lending on a timelier basis or in favourable terms, for example, is not measured in the model.

Zecchini and Ventura (2009) applied another approach to evaluate the ability of the Italian scheme to create additional lending to SMEs which enabled them to make a claim about the percentage of additional loans provided due to a Credit Guarantee Scheme. The authors stated that no existing study provided econometric evidence about the causality between Credit Guarantee Schemes and financial additionality. Furthermore, they found fault with the fact that there is no econometric estimation of the scheme's impact on borrowing costs for SMEs with guarantee exists. In using financial data of 11,261 SMEs with and without guarantee provided by the AIDA balance sheet data bank, they tested whether and to what extent the Credit Guarantee Schemes in Italy affects costs and credit supply to SMEs. By running regression analyses and econometric tests, they found evidence that the Italian Credit Guarantee Scheme reduces the costs of lending for the borrowers of between 16 and 20 per cent. Moreover, a median additional supply of loans to SMEs of about 12.4 per cent was estimated.

Demonstrated by the few exemplary studies, it can be said that the existing research is rather inconsistent. No clear statement can be made about the ability of Credit Guarantee Schemes to provide additional loans to SMEs. This is partly due to the differences of the schemes in the world. Additionally, no definite statement can be made about additionality. One can never say whether a loan would have also been provided without the existence of a guarantee scheme. This was something Riding et al. (2007) at least tried to estimate. However, this is considered to be almost impossible to assess definitively.

2.2.2 Macroeconomic impacts

By implementing Credit Guarantee Schemes, governments throughout the world seek to stimulate bank lending to SMEs with viable business ideas to initiate

economic growth. Therefore, it is obvious that the economic impact of Credit Guarantee Schemes is an appropriate means to measure their efficacy. This is why many of the existing studies analyse the schemes' impact on job creation and economic activities. Table 2.2 contains the main studies that examine the economic impact of Credit Guarantee Schemes.

Table 2.2: Literature summary about the economic impact of CGS

Details	**Research**	**Key findings**
Author: Bradshaw (2002) CGS: California State Loan Guarantee Program (SLGP) Sample: 1,166 firms that received 1,515 loan guarantees (1990 – 1996) Methods: Pre-post comparison; questionnaire with 300 firms of the overall sample (response rate: 59%)	Objective: The author assessed the public benefit in terms of jobs and economic activities directly attributable to small business loan guarantees by SLGP.	The following increases attributable to SLGP were found: - Employment (all firms): 40% - Employment (non-agricultural firms): 27% - State tax revenues: $ 25.5 million
Authors: Lelarge, Sraer, Thesmar (2008) CGS: SOFARIS resp. OSEO-Garantie, France Sample: 1,362 with guarantee 205,852 control firms without guarantee (created 1988-1999) Methods: Regression analysis	Objective: The authors evaluated the impact of SOFARIS guarantees on the future development of newly created ventures.	The authors found: - SOFARIS firms showed higher employment growth - Guaranteed loans had a permanent, significant and sizable impact on capital growth - no clear evidence of a positive correlation between guaranteed loans and firm creation was identifiable
Authors: Oh, Lee, Heshmati, Choi (2009) CGS: Korea Credit Guarantee Fund, Korea Technology Credit Guarantee Fund (2001-2002) Sample: 44,013 resp. 50,584 manufacturing firms Methods: Propensity score matching	Objective: The authors evaluate the impact of two Korean guarantee schemes on growth in firm size, productivity, R&D, investment and survival.	The authors found that the analysed Korean guarantee schemes positively affected employment, growth of sales, wage levels and the survival rate of supported firms.

Table 2.2 (continued)

Details	Research	Key findings
Authors: Schmidt, van Elkan (2006 + 2010) CGS: German guarantee banks Sample: 10,136 firms with guarantee in 1996 - 2002, 3,050 firms with guarantee in 2009; interviews with 128 bank managers Methods: Desk research, expert interviews, questionnaires, macroeconomic projection model Response rate (firms): 18% + 39%	Objective: The authors examined the macroeconomic impact of the German guarantee banks.	They found a positive impact on employment, GDP and tax income.

Schmidt and van Elkan (2006) undertook a broad study about the macroeconomic impact of the guarantee banks in Germany. They analysed official data from the German guarantee banks to calculate the average amount of investments per year caused by the guarantee scheme. Using a macroeconomic projection model the authors derived the macroeconomic impact attributable to the investments made by guaranteed loans. To get additional information from firms that received a guarantee they sent out a questionnaire to 10,136 SMEs whereof 1,694 firms answered (response rate: 18%). Out of those 1,694 firms, 19 per cent stated that their investment would have been made even without the guarantee but most likely to a lesser extent. This gave a rough impression about how many investments were solely attributable to the guarantee scheme. Nevertheless, the authors derived different scenarios (100%, 75% and 34% of the investment directly attributable to the guaranteed loan). The results confirmed a positive impact on employment, tax revenues and GDP. One weakness of the study is the difference of periods under consideration. The authors sent out questionnaires to SMEs that received guaranteed loans in 1998, 1999 and 2003. There is not further explanation why exactly those years were chosen. The results of the questionnaire were utilized to create the different scenarios for the projection model. These scenarios were simulated for loans with guarantees from 1996 respectively 1996 – 2002. Thus, the information drawn from the firms that answered the questionnaire may not coincide with those of

the firms analysed in the projection model. Another weakness concerns the overall results of the study. The study failed to consider firms that were in default. However, it is important to integrate these firms when measuring the overall macroeconomic impact as firms in default that received a guarantee considerably reduce the positive effects. Therefore the results need to be adjusted. The authors repeated the study in 2010 with firms that received a guarantee from the guarantee banks in 2009. The second study confirmed the results of the first one. However, the weaknesses mentioned above had not been eliminated.

Another way to evaluate changes in economic activities and employment due to guarantee schemes is to compare the performance of firms before and after they got a guarantee. This approach was used by Bradshaw (2002) to analyse the efficacy of the California State Loan Guarantee Program (SLGP). The sample Bradshaw (2002) used consisted of 1,623 guaranteed loans. At the time of the realisation of the study 108 loans were in default (6.6% out of 1,623) and, therefore, were excluded from the study. To measure the firms' contribution to economic activities, the author used data of 1,166 SMEs that received the remaining 1,515 guaranteed loans between 1990 and 1996 (during the depth of the California recession). These figures illustrate that some SMEs received more than one loan. Bradshaw (2002) compared employment rates from the time before the loans were provided with employment rates after the loans were provided. The data at the time loans were initiated were available through the agencies that administered the guarantees. Actual data about the firms were available for 757 firms only (64.9% of overall 1,166 SMEs). Comparing these data, Bradshaw concluded that guaranteed firms increased their employment by about 40.6%. Due to the data available, Bradshaw just considered the total number of employees and no full-time equivalents which can be stated as one weakness of the study. To obtain data about economic development benefit, Bradshaw selected 300 firms to send a questionnaire including phone and fax follow-ups (response rate 59%). This helped to estimate tax revenues attributable to guaranteed loans. Bradshaw derived an increase of state tax revenues of about 25.5 million USD. However, this amount should be considered carefully as it is only a rough and estimated amount that depicts subjective statements from a small random sample. Moreover, the author did not consider about interrelating the tax revenues and the expenses to establish and run the SLGP. This is important as tax revenues alone are not reliable for measuring the positive economic contribution of guarantee schemes. The connected costs have to

be considered as well. Another weakness of the study is that it is considering a period of economic recession. To gain a more complete overview about the macroeconomic contribution of guaranteed firms, it would be necessary to consider the performance of those firms during a complete economic cycle. The main weakness of Bradshaw's study is the fact that loans are considered as necessary conditions for growing economic activities. It is assumed that without the loans the borrowers would not have been able to perform as well as they did after receiving the loan. But this cannot be said with absolute certainty. Borrowers may have been able to successfully run their business even without obtaining the loans; it could be that obtaining the loans enabled them to use their own resources for other purposes.

Another approach to measure economic additionality attributable to guarantee schemes is comparing the performance of guaranteed firms with the performance of a peer group of borrowers without guarantees. On the one hand, many researchers, including Bradshaw (2002), are of the opinion that this is not effective (Boocock and Shariff, 2005; Green, 2003; Riding and Haines, 2001). They argue that it is problematic to compare firms as motivations and constraints vary widely among SMEs. On the other hand, this approach is used by other researchers to measure the efficacy of Credit Guarantee Schemes (Oh et al., 2009; Lelarge et al., 2008).

Oh et al. (2009) analysed the impact of the Korea Credit Guarantee Fund and the Korea Technology Credit Guarantee Fund on growth of sales, employment, wage levels and survival rates of guaranteed firms during the post economic crisis period (2000-2003). They concentrated on manufacturing firms with more than five employees. To avoid the problem of insufficient comparability of supported with non-supported firms, they applied the propensity score matching methodology. This methodology allows them to construct comparison groups by "…matching twin firms based on the propensity score in the population of unsupported firm groups" (Oh et al. 2009, p. 340). They observed the growth in performance during 2001 and 2002 of 44,013 firms with and without guarantees that already existed during 2000 and 2003. Their results showed that the Korean guarantee schemes positively affected employment, growth of sales and wage levels. To evaluate the impact of credit guarantees on firm survival, they analysed a sample of 50,584 firms that existed between 2000 and 2002 and survived in 2003. Their findings also confirmed positive impact on the survival rate of supported firms. One weakness of the

investigation is the concentration on manufacturing firms with more than five employees. This disregards the smallest of all firms as well as firms of different sectors. Therefore, the study fails to give a profound overview about the impact of the guarantee schemes as a whole. Moreover, it fails to consider a whole business cycle. One argument of the study is that the Korean guarantee schemes support firms with lower productivity. This may qualify the results of the study as those firms in general boast a relatively greater potential to grow in size. Supporting those firms may hamper the process of creative destruction. This is an important argument which has to be analysed in more detail as this may have a negative impact on the economy as a whole which would lower the positive impact of guarantee schemes on the Korean economy even if a few firms were benefitting.

Lelarge et al. (2008) undertook one of the rare studies about the French loan guarantee programme. They concentrated their study on the scheme's impact on young firms. By comparing 1,362 guaranteed firms with 205,852 non-guaranteed firms, they found that on average firms that received a guarantee showed a higher level of employment creation. Moreover, their employment growth rate did not slow down in the following four years and stayed at a higher level than the average rate of firms without guarantees. The authors also tested the scheme's impact on capital growth and found that the capital of guaranteed firms grew faster. By assessing the impact on firm creation, they found no significant positive correlation. They concluded that the French scheme indeed supports existing firms but rather had no impact on the creation of new firms. They also found that credit guarantee programs induce more risk taking from guaranteed firms. Therefore, they pointed out that continuing to increase these programs may make the marginal firms more and more risky, and thus may be welfare destroying. One weakness of the study is that the authors did not further analyse this fact that may be crucial for a definitive understanding about the impact on the overall performance of guaranteed firms. Another weakness is the significant disparity in the sample size. They contrasted 1,362 guaranteed firms with more than 160 times more non-guaranteed firms. Hence, the results are not truly comparable.

Regarding the results of the literature review, it is necessary to recognise the difficulties in measuring the economic impact of Credit Guarantee Schemes. The performance of a firm is influenced by a range of factors like the elasticity of

demand, business cycles and competition in the market and the region where a certain firm operates. Moreover, it is always a challenge to obtain sufficient and suitable data. Therefore, the impact of Credit Guarantee Schemes on economic growth can hardly be measured accurately.

2.2.3 Ability to initiate a learning process

The third field of research about Credit Guarantee Schemes that shall be discussed here is the ability of the schemes to alter the lending behaviour of banks and initiate a learning process within the commercial banks. Table 2.3 highlights the main literature. The most significant weakness of the existing literature in this field of investigation is that most studies are conceptual.

Table 2.3: Literature summary learning process

Details	Research	Key findings
Author: Craig et al. (2008) CGS: SBA (USA) Sample: Over 360,000 loans from 1991-2001 Methods: Cross-sectional OLS fixed effects regression model	Objective: The authors tested whether SBA loan guarantees had a relatively greater impact on the average level of labour employment in low-income areas than in higher-income markets.	They argued that (especially for firms in low-income markets) it is important to reduce the amount of asymmetric information to reduce credit rationing. As one very practical method to reduce information asymmetries, they mentioned the encouragement of lenders to provide loans to firms they would otherwise not provide any loan. By establishing a relationship with the borrower this helps to reduce asymmetric information and credit rationing for firms in the low-income area.
Author: Flaming (2007) CGS: Guarantees to microfinance institutions (MFIs) around the world Sample: 96 loan guarantees from 8 agencies	Objective: The author reviewed the specific benefits of loan guarantees and describes some of the characteristic features like cost structure and guarantor agencies.	In his study the author mentioned the expectation that experiences with loans to MFIs will raise their willingness to lend to them without guarantee later as the primary rationale for providing guarantees instead of lending directly to MFIs. He found that: - Guarantors and MFI managers confirmed that guarantees help to get loans from banks that they would not have obtained without guarantee. - The provision of guarantees enhances the bank's perception of MFIs. - MFIs would not pay the additional costs for the guarantee if they were able to get a loan without it.
Author: Green (2003) CGS: In general Methods: Conceptual paper	Objective: The paper tried to determine whether CGS are efficient and effective.	The author took the view that CGS need to initiate a learning process on the bank´s side. CGS can help to alter their risk perception of SMEs by learning about their creditworthiness and business. Although, the author challenged whether lenders are truly willing to alter their lending behaviour.

Table 2.3 (continued)

Details	Research	Key findings
Author: Kramer (2008) CGS: Guarantee banks in Brandenburg and Berlin Methods: 38 expert interviews, simulation	Objective: The author examined whether the guarantee banks were able to mitigate credit restrictions for SMEs.	Kramer concluded that the analysed guarantee banks fostered the provision of loans to SMEs, contributed to a reduction of informational asymmetries and helped to initiate learning processes on the bank´s side.
Author: Levitsky (1997a) CGS: In general Methods: Conceptual paper	Objective: The author described how CGS were being implemented and outlined the problems and advantages of the schemes.	Levitsky cited the opportunity for banks to learn about SMEs, their problems and operations as one important objective of CGS. He argued that this helps to manage SME loan portfolios. Thus, banks may realize that SMEs are not as risky as initially expected.
Author: Vogel, Adams (1996) CGS: In general Methods: Conceptual paper	Objective: The authors discussed the ability of CGS to overcome credit market imperfections and the problem to obtain bank loans for some target groups (especially SMEs).	They argued that one aim of CGS is to alter lending behaviour by subsidizing the recovery risk. CGS does exist to foster the production of information about borrowers. Lenders will collect sufficient information about their borrowers with guarantee so that these borrowers will later graduate to borrowers without a guarantee.

Green (2003) provides a comprehensive overview about types, objectives, advantages and disadvantages of Credit Guarantee Schemes in general. The aim of the paper is to assess whether Credit Guarantee Schemes are effective and efficient in promoting private sector-led growth. Green (2003) argues that one aim of Credit Guarantee Schemes is to make loans available to credible SMEs that they otherwise would not have obtained. Therefore, it is important to create a learning process for the lending bank. Lenders must alter their risk perception of SMEs. By providing a guarantee and initiating a loan to SMEs, banks can learn about the creditworthiness of SMEs without bearing the risk involved. Those borrowers that otherwise would have been perceived as too risky and would not have received a loan get the opportunity to build up a repayment record. That reputation may act as a substitute for collateral. In the future those borrowers will be able to obtain loans without a guarantee. By gaining experiences with SME lending, banks will also develop the knowledge and technologies to reduce transaction costs and make SME lending more profitable and attractive. Transaction costs are one of the main deterrents to lend to SMEs. Therefore, Green argued, one aim of Credit Guarantee Schemes should be the reduction of these costs. Due to the guarantee coverage, the costs of default were reduced. The administrative costs may be reduced if the guarantor undertakes the

screening and monitoring. However, this would have the disadvantage that the bank will not get the opportunity to develop techniques to lend to SMEs efficiently and a learning process cannot take place. The author also added the consideration that it is not clear whether the behaviour of banks truly can be altered by Credit Guarantee Schemes. The author referred to critics that take the view that banks will not seriously be willing to alter their lending behaviour. They will take the guarantee to reduce their risk but will have no intention to bear the whole risk themselves by lending without guarantee later on. In this point, the weakness of Green's paper becomes obvious. As it is only a conceptual paper, no empirical results can support or prove the statements she made. Moreover, she admittedly referred to 'critics' of credit guarantee schemes but fails to identify the literature used. Thus, the arguments the author referred to are not empirically proven.

This weakness is also applicable to the papers of Levitsky (1997a), and Vogel and Adams (1996). Levitsky (1997a) concentrated on the implementation of Credit Guarantee Schemes all over the world and illustrated some of the problems faced as well as the advantages of the schemes. He argued that Credit Guarantee Schemes are intended to help commercial banks to improve their handling of SME loans. Banks that are willing to provide a loan to a SME under the condition that a guarantee scheme reimburses a part of the inherent risk get the opportunity to learn more about the problems and operations of SMEs. This may help banks to learn how to lend profitably to SMEs even without guarantees. Levitsky pointed out that SME lending has never been attractive for banks due to their fear of increasing costs and bureaucracy. Moreover, he argued that governments sometimes have to threaten banks with penalties unless they participate. This is far too narrowly considered. Levitsky failed to analyse the reasons why banks take part in SME lending and make use of credit guarantees. In some countries, like Germany, Credit Guarantee Schemes have a long history; banks have insisted on guarantees for a long time and still do. Thus, it would be interesting to find out whether schemes were able to make lending to SMEs a routine and whether any alteration in their lending behaviour can be perceived.

Vogel and Adams (1996) concentrated on the ability of Credit Guarantee Schemes to overcome credit market imperfections and thereby enhance the access to bank loans for SMEs. They pointed out that, other than direct subsidies to loans, Credit

Guarantee Schemes attempt to alter the lending behaviour of banks by undertaking a part of the initial loan-recovery risk. The schemes were established to stimulate the commercial banks' collection of information about borrowers that are widely recognized as informationally opaque. Vogel and Adams referred to advocates of Credit Guarantee Schemes who argued that borrowers will be able to borrow without a guarantee once lenders have had positive experiences with these new clients who have guarantees. This is partly due to the fact that borrowers learn how to apply successfully for formal loans and partly due to the opportunity of the lenders to collect sufficient information about the borrowers. It is a major weakness of the paper that Vogel and Adams do not make any detailed reference, especially in this context. They do not cite the mentioned proponents. Thus, it cannot be evaluated whether these people are in the position to estimate these mechanisms. Moreover, it is not clear whether the authors can prove their statements by any empirical analysis. Moreover, Vogel and Adams concluded that Credit Guarantee Schemes are only the second-best approach to overcome information problems and lower credit restrictions to SMEs. Unfortunately, they missed this opportunity to explain why and to make any recommendations about what they see as the first-best approach.

One study that tested the ability of Credit Guarantee Schemes to induce an alteration of the lending behaviour of commercial banks is that of Flaming (2007). Flaming focused on the benefits of Credit Guarantee Schemes for microfinance institutions (MFIs). Therefore, the study is not completely applicable for the present study which will concentrate on commercial banks and SMEs in general. Flaming examined a set of 96 loan guarantees issued by eight schemes around the world. One weakness of the paper is the fact that the author failed to describe the methods used. One interesting statement in the paper is that guarantee schemes "…provide transaction expertise and credibility that enhances the local bank´s perception of the MFI" (Flaming 2007, p.4). Flaming does not include how he derived this statement. Another statement is that "Guarantors and MFI managers report that loan guarantees help MFIs to get loans (…) from banks that otherwise would not have lend to them" (Flaming 2007, p. 4). This is an important statement about the ability of Credit Guarantee Schemes to provide additional loans to otherwise credit-restricted firms. It would be extremely important to get information about the data used to form this conclusion. Another weakness is the sample size. Flaming analysed 96 loan guarantees. Spread over eight guarantee schemes in different countries, this is

approximately 12 guarantees for every scheme. Thus, the results can hardly be stated as representative.

The papers of Flaming (2007), Green (2003), Levitsky (1997a) and Vogel and Adams (1996) all have in common that they considered Credit Guarantee Schemes in general. To make universal assertions about Credit Guarantee Schemes in general, researchers disregard the fact that there are some fundamental differences existing in different countries which may have an impact on the lending behaviour of banks and the design of the guarantee schemes.

As opposed to analysing Credit Guarantee Schemes in general, Craig at al. (2008) concentrated on the US Small Business Administration (SBA) guarantee scheme. The authors tried to find out whether SBA loan guarantees have a relatively greater impact on the average level of labour employment in low-income areas than in higher-income markets. They put their focus on the macroeconomic impact of credit guarantees rather than on their ability to induce any changes in the lending behaviour of banks. Nevertheless, they also mentioned the need to reduce the amount of asymmetric information between commercial banks and SMEs to mitigate credit rationing. They referred to Credit Guarantee Schemes as one practical method to increase the collection of information by lending banks. By providing guarantees, lenders can be encouraged to make profitable loans to SMEs that they otherwise would not accept as clients. Doing this, they may develop a relationship with the borrower that enables them to collect information at relatively modest cost. This helps to reduce information asymmetries and, therefore, reduces credit rationing in the future. Since Craig et al. (2008) put the focus of their study on macroeconomic viewpoints; there is no further investigation in that topic. Nevertheless, it offers an opportunity for further research. The question whether the provision of a guarantee from the guarantee scheme can foster the creation of a bank-customer relationship is very interesting. Since such a relationship may be one important precondition to reduce asymmetric information, it may indeed help to overcome credit restrictions. More details about the link between lending relationships, information asymmetries and the mitigation of credit restrictions will be presented in Section 2.6.

One of the few studies about the German guarantee banks is that of Kramer (2008). He concentrated on the guarantee banks in the federal states Brandenburg and Berlin and analysed whether these two banks helped to overcome credit restrictions for

SMEs. He conducted 38 expert interviews with bank managers of commercial and guarantee banks. Additionally, he ran a simulation to estimate the probability of default under certain circumstances based on the figures of the guarantee bank Brandenburg. Learning in the context of Kramer's study mainly means that commercial banks learn how to better collect and evaluate information about SMEs as well as improve processes of loan applications of these firms. According to the author, a better understanding of the firms and the associated risks can result in a mitigation of credit restrictions. To evaluate the ability of the guarantee banks to stimulate an alteration of the lending behaviour of commercial banks, the analysis is concentrated solely on the results of the expert interviews. The simulation did not provide any reference to the learning process. The expert interviews of Kramer contained more than 30 main questions. Only one of these questions dealt with the topic of a learning process. The author asked the interviewees whether they personally or their bank had learned anything during the process of allocating a guarantee to an SME. There is no detailed table about the answers the interviewer received. Therefore, it is not clear, how many answers were given to that question. Only the overall statement was given that corporate account officers learned to devote themselves more to products, orders, the future development and the certain sector of an SME. Kramer (2008) noted that they learned that it could be helpful to visit their clients in their companies. These are rather generalized statements, and it is hard to believe that this is something bankers really have to learn from guarantee banks as this should be self-evident. Analysing markets, products and sectors should be an everyday business activity for corporate account officers making loan decisions. Kramer also argued that guarantee banks help to overcome asymmetric information. He gave reasons for his assertion by referring to answers from his interviewees. According to Kramer, some of them indicated that guarantee banks have another perspective even if they do not have more information at their disposal than commercial banks have. Kramer referred to respondents that argued that guarantee banks often have information that might have a negative impact on the creditworthiness of SMEs and which is not available for the commercial banks. For that reason, these respondents concluded that the cooperation with a guarantee bank may protect against information deficits as the guarantee banks sometimes generate more useful information than the commercial banks do. However, these arguments were not been supported with definite examples. This can be considered as a strong

weakness in Kramer's study. Regarding this and other weaknesses pointed out here, the arguments of the author seem to be inconsistent. On the one side, he stated that guarantee banks do not have more information than commercial banks. On the other side, he stated that they have information that commercial banks do not have. Consequently, it did not become clear where the reduction of information asymmetries should derive from.

Summing up, the rather conceptual literature and the weaknesses of the existing studies offer some interesting opportunity for further investigation about the impact of Credit Guarantee Schemes on SME lending. Since information plays a crucial role in bank lending and SMEs are often considered as being credit restricted because of insufficient information, Credit Guarantee Schemes might be a suitable instrument to put in motion processes that help to overcome information problems between the borrowers and the commercial banks. When guarantee schemes provide an opportunity to commercial banks to lend to SMEs that otherwise would have been credit restricted, this might also give these banks the opportunity to collect information over the course of time and mitigate credit restrictions for the respective SMEs in the future.

2.2.4 Further literature about German guarantee banks

Besides the studies of Schmidt and van Elkan (2006 + 2010) and Kramer (2008) only four additional studies about the German guarantee banks were found which are illustrated in Table 2.4 below.

Table 2.4: Further literature about German guarantee banks

Details	Research	Key findings
Author: Federal Ministry of Economy and Technology (2010) CGS: German guarantee banks Sample: 20 expert interviews, online survey with 2,220 experts Methods: not mentioned Response rate: 27%	Objective: Evaluation of the extension of the program of the German guarantee banks in the context of the economic-growth package II.	The authors concluded that the extension was beneficial and had met the main needs of SMEs within the crisis.

Table 2.4 (continued)

Details	Research	Key findings
Authors: Neuberger, Räthke-Döppner (2008) CGS: German guarantee banks Sample: 780 SMEs Methods: Survey Response rate: 15.5%	Objective: Evaluation of the economic development of firms that received a guarantee from guarantee bank in Mecklenburg–Hither Pomerania.	The authors confirmed positive impacts on firm growth, employment and access to finance.
Authors: Nitsch, Kramer (2010) CGS: German guarantee banks	Objective: Description of Credit Guarantee Schemes in general and the German guarantee banks, no new research.	Only literature based/theoretical paper
Author: Schiereck (2002) CGS: German guarantee banks	Objective: Description of German guarantee banks, no new research.	Only literature based/theoretical paper

In 2010, the Federal Ministry of Economy and Technology in Germany evaluated the extent of the services provided by the German guarantee banks in the context of the Economic-Growth Package II. The German government implemented a loan and guarantee program in the year 2009 to support German firms to overcome problems in obtaining bank loans as a direct impact of the financial crisis of 2007. This program was called 'Wirtschaftsfonds Deutschland.' One part of the program - the Economic-Growth Package II - included the extension of the provision of guarantee from the guarantee banks. Within the period of March 2009 until 31 December 2010[5], the maximum rate for a guarantee was increased to 90% (prior it was 80%) and the maximum amount of a guarantee was raised to two million Euro (prior one million Euro). The coverage of the default risk by the federal states was raised up to 80 per cent in the old federal states (prior it was 65%) and 90 per cent in the new federal states (prior 80%) (Federal Ministry of Economy and Technology, 2010). The Federal Ministry of Economy and Technology conducted 20 expert interviews with members of banks, guarantee banks and chambers and an online survey with around 2,220 members of banks, chambers and SME consultancies (response rate was 27%) to evaluate the extension of the program. The Ministry concluded that the extension was important to support SMEs within the crisis and had met the main problems within that time: the decline of the liquidity positions and the higher demand for

[5] The program ended 31 December 2010. After that date the same regulations as before March 2009 were applied (see Section 1.5).

collateral. They also found that the volume of loans provided due to the provision of a guarantee increased by more than 20 per cent. One gap in the research is that it failed to evaluate whether the extension of the program was economically desirable. For example, it missed the opportunity to analyse the default rate of the loans. The increase of the maximum loan amount and the amount of the guarantee will also increase the losses for the warrantors in case of default. This is surely something that can only be measured with a long-term view. However, this is considered to be important to fully examine the effects of the extension.

Neuberger and Räthke-Döppner (2008) evaluated the efficacy of the guarantee bank in the federal state Mecklenburg – Hither Pomerania. The authors used data from a survey of 780 SMEs which was conducted in 2007 by a big German accountancy firm. Out of these 780 SMEs, 700 had received a guarantee from the above stated guarantee bank. The main weakness of the analysis is that only frequency distributions have been presented and interpreted. The authors provided a frequency distribution of firms of different size (measured against the number of employees) at the time the guarantee was provided and in 2006. Based on these data, they concluded that firms have grown constantly. Moreover, they compared the equity ratios and the turnover of the firms in the year of the provision of the guarantee and 2006 which was considered to confirm the economic growth of the firms. All firms were asked about whether the access to bank finance has improved due to the guarantee of the guarantee bank. Seventy-one per cent of the firms confirmed an improvement (Neuberger and Räthke-Döppner, 2008). For the authors, the interrelation between the improvement of the access to bank finance caused by the provision of a guarantee and the growth of the firms was evidence for the efficacy of the guarantee bank in Mecklenburg – Hither Pomerania. However, by presenting solely frequency distributions, the authors missed the opportunity to provide a solid empirical evaluation of the direct relation between these variables.

Additionally, two literature-based theoretical papers about the German guarantee banks exist (Schiereck 2002, Nitsch and Kramer 2012). To be thorough, these studies shall be discussed as well. Schiereck (2002) is solely a conceptual paper explaining the ownership structure, the size and the tasks of the guarantee banks in Germany. The author created a list containing all guarantee banks in the year 1997 including the total assets, the equity and the headcount in 1997. Moreover, Schiereck (2002)

provided a detailed explanation about the objectives of the guarantee banks, and the number and volume of guarantees provided in 1997 collected from the annual statements. The paper is more or less an annual report of all guarantee banks from 1997 (comparable with the reports the Association of German Guarantee Banks provides). It is descriptive as no research was conducted. However, the article provided a good overview about the tasks and the volume at that time.

The paper of Nitsch and Kramer (2010) gives a short description of Credit Guarantee Schemes in general, the parties involved and the aim of the schemes. Moreover, it provides the number and volume of guarantees provided by the German guarantee banks in 2007 and 2008 derived from the annual reports of the Association of German Guarantee Banks. This paper offers good information about German guarantee banks but does not contribute to the academic discussion about Credit Guarantee Schemes as the authors do not contribute any of their own research.

This overview of existing literature about German guarantee banks has revealed that this field of investigation is rather underexplored and needs further research. Section 1.6 has highlighted the need for a regular and thorough analysis of the German guarantee banks. The above presented literature review has demonstrated the existing literature gap which shall be filled by the present research.

2.2.5 Interim conclusion

The previous sections have illustrated the main strands of literature existing about Credit Guarantee Schemes. Summing up, it can be stated that a range of studies exist that have analysed the ability of Credit Guarantee Schemes worldwide to provide additional loans. The results of these studies vary. While most studies found some indications for the provision of additional lending others did not. Problems arise out of different definitions of additionality and the general difficulty of excluding the probability that loans would not have been provided without the scheme. This leads to the conclusion that financial additionality cannot be measured with absolute accuracy. The same applies for the studies about the macroeconomic impacts. Since it cannot be said with absolute certainty that the loans have only been provided because of the existence of the guarantee schemes, it is difficult to exactly identify the macroeconomic effects. Moreover, macroeconomic effects are defined by a vast range of factors like market competition, structural situations in certain regions or the

business cycle. Therefore, a definitive statement about macroeconomic effects of Credit Guarantee Schemes seems to be possible in a long-term perspective only. Additionally, it is indeed problematic to define whether macroeconomic effects were caused exclusively by the existence of a Credit Guarantee Scheme. One option for doing this is a peer group comparison. However, the disadvantages and limitations of such a peer group comparison have been illustrated above. Therefore, these two approaches were not considered to be promising for the present research.

The literature about the ability of Credit Guarantee Schemes to alter the lending behaviour of commercial banks, however, have revealed some interesting approaches for further research. Most of the existing literature presents conceptual frameworks so far. Summing up and putting the basic thoughts of these concepts together, the following can be said: the provision of a guarantee from a guarantee scheme enables a commercial bank to provide a loan to a SME that otherwise would not have received the loan. The reasons for being reluctant in lending to SMEs, according to the authors of the conceptual papers, are the relatively higher risk of SMEs and the related costs (both aspects have been discussed in Section 1.5 in more detail). The provision of a guarantee leads to a reduction of the initial risk for the commercial bank, and the bank can provide the loan. As time passes, the commercial bank can collect information about the borrower. The lack of information is often considered a reason for a higher risk perception by commercial banks causing limited access to bank loans for SMEs (Berger and Udell, 1998; Ortiz-Molina and Penas, 2008). When the provision of a guarantee from a guarantee scheme gives the opportunity to a commercial bank to provide a loan to a SME, it also offers the opportunity to collect information about the firm to better understand the related risk. The reduction of information asymmetries may also increase access to bank loans for the SME. When this is the case, one could conclude that the provision of the guarantee from the Credit Guarantee Scheme was decisive for the mitigation of the credit restrictions. Without the provision of the guarantee, the loan would not have been provided, and the opportunity for reducing information asymmetries would not have been emerged.

To fully understand these mechanisms, not only literature about Credit Guarantee Schemes is important but also literature about the role of information and guarantees for the banks' decisions about whether to provide a loan to a SME or not. The most considerable literature about these aspects will be reviewed in the following.

It shall be noted that prior to this the literature about Credit Guarantee Schemes presented in this section has revealed that many studies only concentrate on statistical data about the firms that received a loan and a guarantee or on evaluating the banks' perspectives. The widespread negligence of SMEs in the existing research is a severe research gap. Since Credit Guarantee Schemes are created to support SMEs, it seems necessary to include these firms into the research. Another weakness that has been revealed by the literature review is the scarcity of empirical research and the predominance of literature-based research about the German Credit Guarantee Scheme. To the author's best knowledge, only a few studies about the German guarantee banks exist and have been included here. Except the studies of Schmidt and van Elkan (2006 and 2010) that provided a short description of their research in English and the explanation of the German scheme of Nitsch and Kramer (2010), all other studies are solely available in German. This is considered to be an obstacle for contributing to the international academic discussion within the research field of Credit Guarantee Schemes. To overcome the main weaknesses derived out of the literature review, the present study is concentrated on the guarantee scheme in Germany. By including SMEs into the research, it analyses the ability of a German guarantee bank to alter the lending behaviour of banks by initiating a learning process as discussed in the conceptual literature.

As mentioned above, not only the understanding of existing literature about Credit Guarantee Schemes is necessary but also the knowledge about existing literature in related research fields is needed for a better understanding of the process of learning. The conceptual papers about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks that have been presented here concluded that learning can take place as a result of reducing information asymmetries between banks and SMEs. Information asymmetries are widely defined as market imperfection that may lead to credit restrictions for SMEs. To learn more about information asymmetries in the context of SME finance, the literature review also contains literature about market imperfections. This is provided in Section 2.3. Some of the studies about Credit Guarantee Schemes also mentioned the role of collateral for making available loans for SMEs. Guarantees from the guarantee schemes act as collateral and help those firms to obtain loans that cannot provide sufficient own valuable collateral. Collateral is often referred to as a substitute for information. Therefore, it seems to be appropriate to also provide some literature about the role of collateral in SME

financing when analyzing the linking of Credit Guarantee Schemes and information. Section 2.4 presents a selection of literature about that topic. The authors of the conceptual papers about the alteration of lending behaviour also mention the significance of lending relationships in reducing information asymmetries and reducing credit restrictions. Consequently, Section 2.5 highlights important literature about relationship lending. This literature overview seeks to understand the best existing research in these fields of investigation and to highlight research gaps related to the present research study. Section 2.6 presents the framework that has been derived out of the literature and highlights the research questions and propositions which act as foundation for the present research. Section 2.7 presents a final conclusion.

2.3 Market imperfections

The assumption that even genuine good borrowers with low-risk projects are unfairly credit rationed is commonly used as justification for the creation and introduction of Credit Guarantee Schemes (Riding and Haines, 2001; Cowling, 2010; Levenson and Willard, 2000; Cressy, 2002). However, it is a controversial issue whether the difficulties in obtaining bank loans are adequate rationale for governmental intervention (Green, 2003; de Meza and Webb, 1992). Proponents typically refer to at least one financial market imperfection or distortion. The literature about market imperfections is manifold. Therefore, this section cannot provide a complete overview of the existing literature. Table 2.5 below contains some basic and current literature that shall be explained in more detail to provide a better understanding of the present research.

Table 2.5: Selected literature about market imperfections

Details	Research topic	Key findings
Author: Akerlof (1970) Methods: Theoretical model	Objective: To explain market mechanisms in a situation where uncertainty about the quality of goods exist.	Demonstrated that uncertainty in a market with goods of different qualities and the lack of trust may result in market failures.
Author: Grunert, Norden (2012) Sample: Germany: 1,062 loans granted 1992-1996; USA: 1,761 loans granted 2003 Methods: regression analysis	Objective: To test the impact of hard and soft information on SMEs bargaining power when applying for a bank loan.	-the assessment of soft information was positively related to the bargaining power and affected the credit scoring and the loan terms -bargaining power persisted over time

Table 2.5 (continued)

Details	Research topic	Key findings
Authors: Stiglitz, Weiss (1981) Methods: Theoretical model	Objective: To demonstrate that loan markets may be characterized by credit rationing in equilibrium.	Provided the first theoretical justification for credit rationing.
Authors: Uesugi, Sakai, Yamashiro (2006) Sample: 1,344 users of the Japanese guarantee program and 2,144 non-users Methods: two-step estimation procedures	Objective: To find out whether the investment-effect of the credit guarantee program exceeds the adverse-selection effect.	They found that the problem of moral hazard of lenders and borrowers was less than the economic benefits of the additional investment projects.
Authors: Van Caneghem and Van Campenhourt (2012) Sample: 79,097 Belgian SMEs that obtained a bank loan in 2007 Methods: Ordinary least-squares regression model	Objective: To test the impact of the quantity and quality of information provided by SMEs on their leverage.	SMEs that provided more information and information on a higher quality relied more heavily on debt finance

A typical market imperfection stated in the context of credit restrictions is that of asymmetric information. Information plays a crucial role in the relationship between banks and SMEs as these are the most informationally opaque enterprises (Berger and Udell, 1998). Information asymmetries arise when borrowers know more about the probability of success of their investment projects than lenders. This situation is often due to a lack of market information about SMEs (Graham, 2004).

A range of theoretical papers about asymmetric information and its impact on bank lending exists. It was decided to present two of the latest studies (Grunert and Norden, 2012; Van Caneghem and Van Campenhout, 2012) to represent the current state of research about that topic. Additionally, two of the most recognized works (Akerlof, 1970; Stiglitz and Weiss, 1981) are presented. These works will give an overview of the field and the relationship between information and access to bank lending. This is intended to illustrate why the evaluation of the ability of Credit Guarantee Schemes to reduce information asymmetries is an important step in analyzing the ability to reduce credit restrictions for SMEs of those schemes.

Grunert and Norden (2012) analysed data from the US Survey of Small Business Finance 2003 and from six large German banks to evaluate the impact of soft and hard information on the bargaining power of borrowers. The time frame of the two

data sets differs significantly. While the US survey was from 2003, the data about the German loans was from 1992-1996. This is a main weakness of the study as the data is not really comparable. The authors analysed bargaining power by measuring ex post indicators like contracted loan terms and relative effects like comparing the bargaining power of two borrowers. They run correlations and regression analyses and found a positive correlation between soft information (character and management skills) and bargaining power which can help to overcome credit restrictions. Another weakness of the study is that there are no clear statements about the relationship between hard information and bargaining power.

Van Caneghem and Van Campenhourt (2012) tested whether amount and quality of information provided by financial statements affects the leverage of SMEs. The quality of the information provided was measured by whether the firms voluntarily provided external financial statements or by the quality of the auditor. They analysed data from several Belgian statistical databases of the year 2007. Their final sample contained 79,097 firms. By running ordinary least-squares regression models, the authors found that those firms with low quality information or not enough information were less likely to be using external financing. Firms that provided more information and more qualitative information used more external debt. This confirmed the assumption of a positive relationship between information asymmetries and credit restrictions for SMEs. One weakness of the study that shall be mentioned here is that it is not clear if the use of debt finance is related to the amount and the quality of information provided and not to other things like different needs for external finance or different equity bases.

In their seminal work, Stiglitz and Weiss (1981) demonstrated by running a theoretical model that informational problems can lead to market failure in allocating loans to SMEs efficiently. They contend that banks always consider two factors when they come to a decision on whether they grant credit to an SME or not: the interest rate and the riskiness. If banks can obtain all relevant information, they will charge exactly the interest rate that reflects the riskiness of a borrower. If demand exceeds supply, they will raise the interest rates to the equilibrium price. In the presence of uncertainty in assessing SMEs and to maximize their profits, banks always seek to identify those borrowers who are most likely to repay the loans. In situations where banks do not have sufficient information about their borrowers it is

not possible to accurately measure the quality of the borrowers and to offer contracts that reflect their actual risk level. Borrowers that are denied a loan and offer to pay higher interest rates or to pledge more collateral will still not get a loan. An increase of the interest rate or the demand for collateral may result in an increasing risk of the bank's loan portfolio for two possible reasons. The first is that lower risk borrowers might be discouraged from borrowing due to the high costs and collateral demands. The second is that borrowers might be encouraged to shift into projects that are more risky (moral hazard, see below) and, therefore, increase the risk and decrease the profit for the lender. In such a situation, the demand and the supply of loans will not be balanced.

The inability to measure the quality of a borrower due to the lack of information can lead to adverse selection (Akerlof, 1970). Using a theoretical model, Akerlof (1970) illustrated the impact of insufficient information by discussing the market for used cars. In a situation where the sellers have more information about the cars than the buyers, buyers cannot distinguish between good and bad cars. To cover their opportunity costs, sellers of good cars must always require a higher price for their cars than sellers of bad cars. However, since sellers of bad cars know that buyers cannot distinguish the quality of the cars due to the lack of information, they can pretend they are selling good cars and require higher prices. This might end up in a situation where the sellers of good cars are no longer able to cover their costs and disappear from the market. This leads to a market imperfection in a way that good cars will no longer be offered. This example can serve as an analogy for the provision of bank loans.

Related to the price of the cars in the example of Akerlof (1970), the price for a loan is the interest rate. The interest rate lenders demand from their borrowers may affect the riskiness of a loan and, therefore, the potential profitability of the lender in two ways. Borrowers who are willing to pay higher interest rates for their loan may be more risky. This adverse selection-effect is based on Akerlof's 'lemon's principle'. It can be explained by two arguments: First, borrowers with projects that show a high risk know that their probability to default is high. Therefore, they are willing to borrow at higher interest rates. Second, higher interest rates will expel borrowers with low-risk projects. This is the case when higher returns are expected for projects with higher risks. Consequently, higher costs of credit (due to a higher interest rate)

have to be compensated with riskier projects. In addition, the interest rate may affect the behaviour of the borrower. Higher interest rates may mislead the borrower to divert the funds to more risky projects. An increase of the costs of borrowing may consequently lead to a decrease of the quality of the pool of borrowers of a bank. Another problem that can arise from information asymmetries is that of moral hazard. It is based on the principal-agent theory. Moral hazard occurs when the agent (e.g. a borrower) acts in a way that has an adverse impact on the return of the principal (e.g. the lender). This can happen when the action of the agent cannot be thoroughly monitored by the principal. In such a situation, the borrower may switch to a riskier project without informing the lender or may even just do his or her best to be as successful as possible. According to Green (2005) moral hazard can be reduced by the lenders either by giving some incentive to the borrower to be honest with the lender or by requiring collateral which can be lost in case of the default of the borrower.

Moral hazard can occur on the part of the borrower as well as on the part of the lender which has been evaluated by Uesugi et al. (2006). The authors analysed whether the introduction of a credit guarantee program in Japan stimulated the investment of SMEs or rather worsened adverse selection problems. The implementation of the credit guarantee program was limited to the time between 1998 and 2001 to overcome a credit crunch faced by SMEs in Japan. During that time, the Japanese government provided guarantees of about 30 trillion yen. In case of a default of the supported borrowers, the program covered 100 per cent of the loss. The credit guarantee program was exceptional in that most Japanese SMEs could apply for a guarantee if they were credit rationed or not. The research of the authors was based on the 2001 Survey of Financial Environment. The survey contained a question about whether a guarantee of the credit guarantee programme was obtained or not. By applying two-step estimation procedures for firms that received a guarantee (1,344 firms) and those that did not obtain a guarantee (2,144 firms), Uesugi et al. (2006) analysed two effects. The first effect was called the investment-effect and was considered to be positive in that the guarantee program enables the realisation of beneficial investment projects since it reduced the interest rate and lowered credit restrictions. The second and negative effect was called adverse-selection effect. This means that the coverage of 100 per cent of the default risk reduced the incentives of the lenders to accurately monitor the loans and increases

moral hazard of the banks. Moreover, it increases moral hazard on the part of the borrowers since the losses would be completely covered by the program in case of default. They concluded that the positive effects exceeded the negative effects. The economic efficiency was positive for users of the guarantee program and, therefore, suggested a positive impact of the program on the Japanese economy. A strong weakness of the study is that it was concentrated on successful firms only. Firms that were in default were not considered but might have had an enormous impact on the results of the adverse selection effect. Moreover, a detailed description of the results about the adverse selection effect to allow a better understanding of the conclusions is missing.

The presented literature has demonstrated the role of information in loan decisions. It has demonstrated that information asymmetries may result in adverse selection and moral hazard and in an increase of the default rates for the lending banks. In a market with imperfect information and excess demand it may consequently be better to ration the preferable credit volume by refusing loan applicants rather than raising the interest rate (Stiglitz and Weiss, 1981; Bester, 1985; Camino and Cardone, 1999). For this reason, even creditworthy SMEs with feasible business ideas may suffer from credit rationing. A reduction of information asymmetries might, therefore, mitigate credit restrictions.

The conclusion of the present research regarding the ability of Credit Guarantee Schemes in altering the lending behaviour of commercial banks and reducing credit restrictions for SMEs is as follows: the provision of a guarantee from a guarantee scheme enables a SME to obtain a bank loan that it otherwise would not have received. The commercial bank now gets the opportunity to collect information about the SMEs or, to put it in another way, to reduce information asymmetries. This might result in a reduction of credit restrictions for SMEs. To fully understand this process, it has to be evaluated why exactly the provision of a guarantee facilitates the provision of the loan for the commercial bank. Guarantees of guarantee schemes provide collateral to the bank. Therefore, collateral must play a crucial role in the whole process that shall be analysed. Consequently, the following section illustrates some basic literature on the significance of collateral in bank lending for firms.

2.4 The significance of collateral in bank lending to firms

Collateral plays an important role in bank lending since it reduces the bank's loss in case a borrower defaults. The inclusion of collateral in a loan is costly for the lenders as well as for the borrowers. For the lenders, costs arise in valuing and screening collateral and in the event of repossession (Leeth and Scott, 1989). Therefore, the inclusion of collateral might have a negative impact on the profit of the banks (Bester, 1985). For the borrowers it might occasion opportunity costs as assets, that otherwise would have been used more productively, are tied up (Berger et al., 2011a). Nevertheless, the inclusion of collateral in a loan can also increase the profit of the lender. According to the lazy bank theory of Manove et al. (2001), the provision of collateral may weaken the incentives of the banks to thoroughly monitor a borrower and an investment project. This is related to lower screening costs which may increase the overall profits of a bank.

Collateral is also widely thought to mitigate problems arising from asymmetric information like adverse selection since it can be considered as substitute for information (Voordeckers and Steijvers, 2006; Berger et al., 2011a; Menkhoff et al., 2012; Steijvers et al., 2010). Collateral can play a disciplinary role for the borrowers in a way that borrowers get an incentive to use the money they received productively and not carelessly shift into more risky projects. This helps to reduce the risk of moral hazard for the lender (Manove et al., 2001).

The literature about the role of collateral in bank lending is manifold with two main strands of investigation. The one strand is about ex ante theories regarding the meaning of collateral for unobservable riskier borrowers and is therefore based on the existence of information gaps that can lead to adverse selection and credit rationing. This theory predicts that these borrowers are considered to pledge less collateral when receiving a bank loan. The second strand is about ex post theories regarding the significance of collateral for observable riskier borrowers and is therefore based on the occurrence of moral hazard. It predicts that more collateral is required for borrowers that are deemed to be more risky (Berger et al., 2011a; Berger et al., 2011b). The literature about the relation of collateral and bank lending is extensive. This section can only provide a small sample of the existing research about that topic. Table 2.6 presents selected literature about the role of collateral in reducing problems of asymmetric information that will be explained in more detail.

Table 2.6: Selected literature about collateral

Details	Research	Key findings
Authors: Berger et al. (2011a) Sample: 14,000 loans (1993-1997) in USA Methods: Logit regression	Objective: To test whether a reduction of information asymmetries by using credit scoring technology results in lower collateral requirements.	The use of credit scoring technology reduced information asymmetries and the need for collateral by approximately 6 per cent.
Authors: Berger et al. (2011b) Sample: 32,286 bank loans to 2,676 firms in Bolivia Methods: Probit regressions	Objective: To identify the impact of observed and unobserved risk on the provision of collateral.	The authors found that unobservable riskier borrowers pledged less collateral when they were less known by the lender. Observably riskier borrowers with a long lending relationship pledged more collateral.
Authors: Besanko, Thakor (1987) Methods: Theoretical model	Objective: To evaluate the impact of collateral on credit rationing.	The authors demonstrated that the risk of a lender is positively related to the interest rate and negatively correlated with the provision of collateral.
Author: Bester (1985) Methods: Theoretical model	Objective: To demonstrate that no credit rationing will occur in equilibrium when banks when banks require collateral.	The authors found that in credit market equilibrium with perfect information no credit rationing existed.
Authors: Gonas et al. (2004) Sample: 7,619 loans in USA (1988 – 2001) Methods: Logit regression	Objective: To analyse the factors influence the demand for collateral.	The authors found that factors that are typical for adverse selection, moral hazard and the likelihood of a default were positively related to the provision of collateral.
Authors: Menkhoff et al. (2012) Sample: 1,671 loans in Thailand Methods: Probit regressions	Objective: To evaluate the impact of relationship lending and third-party guarantees on the lack of collateral.	The authors concluded that third-party guarantees and relationship lending acted as substitute for collateral and mitigated credit restrictions.

The ex post theory was tested by Gonas et al. (2004). The authors examined the impact of information, moral hazard and protection against losses on the demand for collateral of banks. They used information about the borrowers, the lenders and the contract terms of 7,619 loans that had been issued between 1988 and 2001 in the US. The data was provided by the Loan Pricing Corporation DealScan database. To measure the quality and quantity of information, they differentiated whether borrowers were exchange-listed or had a credit scoring grade. By running logit

regressions, they concluded that firms without a rating more often pledged collateral than rated firms. Another measure for information was whether borrowers were domiciled in the US. Those that came from the outside the US had more often pledged collateral than firms from the US. These results confirmed the assumption that information asymmetries are positively related to the provision of collateral. For measuring moral hazard, they used information about the loan maturity and found a positive relationship between loan maturity and provision of collateral. However, the authors stated that moral hazard was very difficult to investigate (Gonas et al., 2004). To investigate the impact of the risk of default for the demand for collateral, they limited their sample to those borrowers that had obtained a credit scoring. The results indicated that the risk of a loan was positively related to the demand for collateral. One shortfall of the study is that it only considered hard information when analysing the impact of information asymmetries on collateral. However, soft or private information plays also a role when analysing the significance of information for the need of collateral.

Berger et al. (2011a) also concentrated on the impact of credit scoring systems on the reduction of information asymmetries and the provision of collateral. The authors conducted logit regressions with official statistical data about 14,000 loans issued between 1993 and 1997 in the US. They also concluded that the use of credit scoring systems helped to overcome information asymmetries and lowers the demand for collateral. Berger et al. (2011a) inferred that the use of credit scoring technologies may mitigate credit restrictions especially for firms with asymmetric information problems and a lack of collateral since these systems reduced the need for collateral. This is elusive as the scoring technologies were based on the information. The existence and the use of these technologies alone will not reduce existing information asymmetries. Firms that cannot provide information will obtain a bad credit scorings and, therefore, still be required to provide collateral or even credit rationed.

While the studies above provided evidence of the relationship between the use of collateral and observable risk, the following studies concentrated on the relationship between collateral and unobservable risk.

The first two studies that shall be mentioned here are rather theoretical ones. Bester (1985) ran theoretical models that demonstrated that in credit market equilibrium with imperfect information about the risk of the borrower, credit restrictions did not

exist when the lenders use the collateral requirements as signaling device. Under these conditions borrowers were always pooled in bad and good ones. More risky borrowers chose a loan contract with lower collateral requirements and a higher interest rate while low-risk borrowers chose loan contracts with lower interest rate and higher collateral requirements. The author presupposed that low-risk borrowers had sufficient collateral to pledge. However, this cannot be assumed.

Besanko and Thakor (1987) also ran a theoretical model that confirmed the results of Bester (1985). They simulated a market with perfect competition where banks could pool borrowers into divergent risk classes by offering loan contracts with different interest rates and collateral requirements. The authors demonstrated that in such a situation low-risk borrowers chose loan contracts with high collateral requirements but low interest rates where high-risk borrowers chose the opposite.

These results were disproved by the more recent and less theoretical study of Berger et al. (2011b). The authors combined the two theories in their study. They analysed credit registry data including private and public information of 32,286 bank loans provided to 2,676 different firms in Bolivia between 1998 and 2003. Private information was not available for the lending banks. This allowed the authors to measure both the observable and the unobservable risk for the sample. The authors conducted probit regression analyses and found that borrowers with observable higher risk were more likely to pledge collateral. The findings correspond to the ex post theories. According to these theories, observably riskier borrowers have to pledge more collateral to reduce the risk of moral hazard for the lending bank. Another result was that borrowers with positive private information decided to pledge more collateral. In doing this they can signal their quality to the borrowers. This especially applies when the relationship to the lending bank was short, and the bank does not know enough about the good quality of the borrower. These results imply that the ex ante theories only apply for borrowers with no or a relatively short lending relationship to the bank. For these borrowers, asymmetric information problems were more severe. The length of the lending relationship was detected to be negatively related to the demand for collateral.

For the present research, the study of Menkhoff et al. (2012) is of certain interest. The authors examined the role of third-party guarantees and relationship lending substituting for missing collateral. They analysed a sample of overall 1,671 loans to

rural households in north-eastern Thailand based on a household survey in 2007. The households in the survey also operated as small entrepreneurs. Menkhoff et al. (2012) referred to third-party guarantees that can be pledged as collateral if not enough business or private collateral is available. These guarantees help to mitigate an expected loss for the lender but are not considered to solve moral hazard problems. Another mechanism to overcome the lack of collateral mentioned by the authors is relationship lending. By using probit regressions, the authors concluded that third-party guarantees and existing lending relationships frequently acted as substitutes for business or personal collateral and improved the access to bank lending. In respect of the significance of both substitutes, they concluded that third-party guarantees were more important to facilitate the access to bank loans. Regarding the impact of the inclusion of a third-party guarantee on the occurrence of moral hazard, they could not make a definitive statement. However, they found that the inclusion of the collateral substitutes had no significant impact on the default risk of the lenders. The weakness of the study is that only 15 per cent of the loans within the sample provided any form of collateral, and that the authors did not clearly distinguish between loans for consumptions needs of the households and production needs for the entrepreneurs. However, they distinguished between third-party guarantees and other collateral which is also of interest in the present research.

The presented literature about the significance of collateral in bank lending to firms has illustrated the connection between information asymmetries and the need for collateral. Banks require more collateral when not enough information about the borrowers is available (Gonas et al., 2004; Berger et al., 2011a). Guarantees from the guarantee bank are required when borrowers cannot provide sufficient collateral. Without those guarantees, the firms would not have obtained the loans and, therefore, would have to face credit restrictions. Therefore, it seems promising to evaluate whether the provision of the guarantee which enables the provision of a loan in the first place results in a reduction of information asymmetries and finally in mitigating credit restrictions for SMEs. This is the focus of the conceptual papers about the ability of Credit Guarantee Schemes to foster learning (Craig et al., 2008; Green, 2003; Levitsky, 1997a; Vogel and Adams, 1997). Due to the provision of guarantees, commercial banks were enabled to provide loans to SMEs that the banks do not have enough valuable information about. Over the course of time, they get the opportunity

to collect more valuable information and reduce existing information asymmetries. If this works, this might end up in a reduction of credit restrictions in the long term.

The above cited studies of Berger et al. (2011b) and Menkhoff et al. (2012) have also highlighted another interesting connection. They confirmed a positive correlation between the existence or the duration of a lending relationship and the provision of information. This relationship is also mentioned in the conceptual papers about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks that were discussed in Section 2.2.3 (Craig et al., 2008). The impact of lending relationships on the reduction of asymmetric information has been the subject of several studies. Since relationship lending might also play a role in the context of the present research, the following section will provide a selection of existing literature about that topic.

2.5 Lending relationships

The results of the studies of Berger et al. (2011b) and Menkhoff et al. (2012) in Section 2.4 have revealed the impact of lending relationships on the loan availability and collateral requirements for firms. Relationship lending is considered as "…one of the most powerful technologies available to reduce information problems" (Berger and Udell 2002, p. F32) in SME lending. Relationship lending can mitigate information asymmetries by developing private or soft information about, e.g. the creditworthiness, a firm´s financial prospects and owner characteristics over time. This information can help to better assess the risk of the borrower to make a decision about whether to grant a loan to a firm and with which conditions (Menkhoff et al., 2012; Diamond, 1984; Elyasiani and Goldberg, 2004; Berger and Udell, 2002; Kano et al., 2011; Behr et al., 2011). Table 2.7 contains crucial and current literature about relationship lending that will be explained in more detail in this section.

Table 2.7: Selected literature about relationship lending

Details	Research topic	Key findings
Authors: Behr et al. (2011) Sample: 30,100 loan applications between 2000 and 2006 in Mosambique Methods: Probit regressions	Objective: To evaluate the impact of lending relationships on loan decisions.	The authors found a positive impact on lending relationships on the availability of bank loans for micro and small firms and the reduction of information asymmetries.
Author: Berger, Udell (1995) Sample: About 3,400 businesses in USA (1988 – 1989) Methods: Regression analysis	The authors examined the influence of customer-bank relationships on loan interest rate and collateral requirements.	They found that firms with lending relationships had to pledge less collateral. Moreover, they found that the interest rates decreased as a function of duration of the relationship.
Author: Cole (1998) Sample: 5,365 small businesses (USA, 1993) Methods: Multivariate logistic regression analysis	The author examined the direct impact of lending relationships on the likelihood that a lender denies or extends a loan.	His results confirmed a positive impact of lending relationships on the availability of credit as well as on the generation of valuable private information. He also found that the probability that the lender will extend was negatively correlated to the number of financial services used.
Author: Harhoff, Körting (1998) Sample: 1,509 German SMEs Methods: Interviews, multi-variate regression analysis	The authors examined the impact of lending relationships on the availability, cost and collateral requirements of German SMEs.	The authors found that lending relationships improve credit availability, collateral requirements and interest rates for SMEs. The results suggest that lending relationships had a greater positive impact on credit availability and collateral requirements than on interest rates/price.
Author: Petersen, Rajan (1994) Sample: 3,404 businesses (USA, 1988-1989) Methods: Regression analysis	The authors examined how customer-bank relationships affect the cost and availability of funds to the firm.	They found no relation between the length of a lending relationship and the price of credit. However, they found that credit availability increased with the length of a lending relationship.

Some studies exist about relationship lending. Two of the most important ones are those of Berger and Udell (1995) and Petersen and Rajan (1994). Both studies analysed data from the U.S. National Survey of Small Business Finance. The data was obtained by telephone interviews in 1988 and 1989. Petersen and Rajan (1994) examined the effect of lending relationships on cost and availability of funds for firms with fewer than 500 employees. By conducting regression analysis, they could not find any relation between the length of a lending relationship and the price of credit. However, they found that credit availability increased with the length of a

lending relationship. The authors pointed out the difficulties to measure credit availability as it could not be determined whether a firm had no loan because it did not need one or because it was credit rationed (Petersen and Rajan, 1994). For that reason they used the extent of trade credit paid late as an indicator for credit availability. Trade credit is probably one of the most expensive external sources of finance (Harhoff and Körting, 1998). Therefore, an extensive use of trade credit can be considered as indicator for credit constraints, Petersen and Rajan stated. As not all firms in the sample received trade credit, they had to cut down their sample size to less than one third of the initial sample (1,119 of 3,404). The findings of Petersen and Rajan (1994) confirmed a positive impact of lending relationships on credit availability for SMEs. Nevertheless, the indirect measurement and the reduction of the sample can be considered as one weakness of the study.

Berger and Udell (1995) noted that another weakness of the above study is that the authors combined various types of loans in their interest rate regression. They decided to concentrate on one particular type of loan to provide cleaner results. Berger and Udell (1995) used the same data set as the one used by Petersen and Rajan (1994). They tested whether lending relationships had some influence on the interest rate charged and the collateral requirements. They also used regression analysis and indeed found that SMEs with longer customer-bank relationships had to pay lower interest rates and pledged less collateral than other small firms. Based on their empirical results, they also observed the ability of banks to accumulate private information about the firms over the duration of the lending relationship (Berger and Udell, 1995).

Another study about relationship lending based on data of the U.S. National Survey of Small Business Finances was undertaken by Cole (1998). In contrast to Petersen and Rajan (1994) and Berger and Udell (1995), Cole used data from the 1993 survey which "…provides a larger, richer, and more timely dataset…" (Cole 1998, p. 961). Cole tested whether lending relationships have a positive impact on the provision of loans to SMEs. He analysed whether or not SMEs were extended loans as he considered this to be a more intuitive and direct measure than analyzing trade credit (see Petersen and Rajan 1994). Moreover, he analysed different dimension of the lending relationship (saving accounts, checking accounts, financial services, loans). Cole also ran regression analysis and found that lending relationships generate

valuable private information and, therefore, are improving the likelihood that a lender will extend loans to SMEs (Cole, 1998). What he failed to analyse is the question of what impact lending relationships have on the terms of credit. This can be described as one weakness of the study as it is not only important if firms get credit but also with which terms. Banks might provide a loan but with disproportionately high interest rates or the loan amount provided is remarkably lower than the loan amount the firm needed and applied for. If interest rates and conditions are unfavourable, this will not mitigate financial distress for SMEs.

Harhoff and Körting (1998) tried to provide a more complete analysis. They examined the impact of lending relationships on the availability, cost and collateral requirements of German SMEs. The authors used data from a 1997 survey of 1,509 German SMEs conducted by Creditreform, Germany's largest credit-rating firm. Based on this data, the authors conducted face-to-face interviews. The questionnaire they created for the interviews was very similar to the one used by the U.S. National Survey of Small Business Finances. Harhoff and Körting (1998) confirmed that lending relationships improved collateral requirements as well as credit availability for small firms. They even found that lending relationships positively affected the interest rates charged for SMEs. However, the effect on interest rates appeared to be less strong (Harhoff and Körting, 1998).

The more recent study of Behr et al. (2011) analysed a sample of around 30,100 loan applications by 15,000 micro and small firms in Mozambique between 2000 and 2006. The sample contained information about the rejection or acceptance of the loan applications and allowed them to analyse the impact of lending relationships on the loan decision. Moreover, information about collateral pledged was available. The authors applied probit regressions. The number of loans granted per potential borrowers acted as proxy for the intensity of the lending relationship. This allowed measuring the relationship between lending relationship and access to bank loans for the firms of the sample. The results of the analyses demonstrated that the likelihood of obtaining loans increases with the duration of a lending relationship. Moreover, borrowers with longer lending relationships had to pledge less collateral. The analysis showed that not all borrowers obtained a loan. Only around 70 per cent of all applications were accepted. Regarding the risk of the lenders measured by the default rates the results indicated that borrowers that received more than two loans

were not less risky than borrowers that received only one loan. The authors concluded that banks monitored borrowers more intensively when they were new to the bank. At that stage, the information asymmetries were the most severe. After the first loan had been provided, the banks could learn much about the borrower and obtained more information for a second loan decision. Borrowers benefitted from the reduction of information asymmetries and the learning effect of the banks when applying for further loans. Another result of the study was that smaller and younger firms, that are the most opaque benefitted most from lending relationships and learning effects of the banks.

All the studies presented here confirm a positive impact of lending relationships on the access to finance. Lending relationships reduce the need for collateral and help to overcome information asymmetries. This underlines the importance of creating a relationship to mitigate credit restrictions for SMEs. However, referring to the specific research focus of the present study and the evaluation of the process of learning initiated by the provision of guarantees from Credit Guarantee Schemes, it can be stated that the weakness of all existing literature is the fact that it has not been tested whether guarantee schemes can initiate the creation of a customer-bank relationship. Therefore, this aspect has been included in the present research to fill this gap.

2.6 Research questions and propositions

The extensive literature review builds the basis of the present research. The research is based on the conceptual papers about the ability of Credit Guarantee Schemes presented in Section 2.2.3. These papers mainly explained how Credit Guarantee Schemes might or should help to overcome credit restrictions for SMEs. Credit restrictions for SMEs arise from a higher default risk that is associated with SMEs. This association is often due to the fact that commercial banks cannot generate sufficient information about the businesses which applies especially for start-ups, and that the business success is uncertain (Levenson and Willard, 2000). The problem of asymmetric information especially arises for young or new firms that have no track record (Petersen and Rajan, 1994). Another reason is that SMEs often have no audited annual statements. Thus, they cannot prove their creditworthiness to the banks (Columba et al., 2010; Behr and Guettler, 2007). To limit the risk for the

lender, SMEs may provide collateral to the commercial banks. However, especially young and small firms often do not have sufficient valuable assets to pledge (Harhoff and Körting, 1998). Another reason for the restricted access to bank loans for SMEs is the associated costs. SMEs tend to apply for lower loan amounts than bigger firms do. Since every credit assessment causes overhead costs, the costs for SME loans are comparatively higher for commercial banks (Beck et al., 2010; Bosse, 2009).

The central aim of Credit Guarantee Schemes is to provide guarantees to reduce existing credit restrictions and to make available loans to SMEs that these firms otherwise would not have obtained (Honohan, 2010; Beck et al., 2010). The question is how exactly this works and whether the provision of guarantees really helps to overcome credit restrictions for SMEs.

The majority of the overall risk of each guarantee provided by a guarantee bank is covered by the federal states and the federal government. To justify the risk-bearing, it is important to analyse whether guarantee banks really help to overcome credit restrictions for SMEs. Moreover, it is important to find out whether the provision of a guarantee is a singular or a steady and repetitive mechanism. Guarantee banks should be interested in establishing a basis for once credit restricted SMEs to overcome these restrictions and to reach a position in which the firms can obtain bank loans under their own power. The literature review has demonstrated that this has not been analysed so far.

The conceptual studies about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks provided the theoretical basis for the present research. It has been demonstrated in Section 2.2.3 that most of the presented studies referred to the ability of Credit Guarantee Schemes to foster the creation of information about SMEs by the lending banks. Since the provision of a guarantee makes available a loan in the first place, it is assumed that the commercial bank uses this opportunity to collect additional information and therefore reduce existing information asymmetries over the course of time (Craig et al., 2008; Vogel and Adams, 1997). The review of literature about information asymmetries has revealed a close connection between information and the use of collateral. Collateral can act as substitute for information (Steijvers et al., 2010; Berger et al., 2011a). Since guarantees from Credit Guarantee Schemes act as collateral for the lending banks, the provision of a guarantee

mitigates the existence of information asymmetries and makes available a loan to a SME that it otherwise would not have received (Green, 2003).

For a better understanding of the relationship between information, collateral and the provision of a loan, the components for evaluating credit risk will be explained in more detail. The consequences of loan defaults can be divided into expected losses and unexpected losses[6]. Since defaults can partly be predicted with a particular statistical probability, the concomitant losses have to be calculated and considered when loan decisions are made and loan prices are calculated. The part of a loss that can be predicted is called expected loss (EL). It is calculated by multiplying the exposure at default (EaD), the loss given default (LGD), and the probability of default (PD) of a loan.

$$EL = EaD \times LGD \times PD$$

The exposure at default is defined by the expected outstanding liabilities of the lender towards the borrower in case of default. The loss given default is the part of the exposure at default that will not be paid back by the borrower in default in the case of a default. It is calculated by subtracting the recovery rate from 1. The recovery rate is determined by the collateral pledged by the borrower (Daldrup, 2005; Schierenbeck et al., 2008; Becker and Peppmeier, 2013). Consequently, the value of collateral has a direct impact on the recovery rate and the expected loss. To quantify the recovery rate, banks analyse the possible impacts of the value of the collateral pledged. In this regard, banks evaluate whether the value of collateral itself is expected to be impaired by the default of a borrower. The probability of default is the expected probability that a borrower defaults. The probability of default is defined by the creditworthiness of a borrower and is calculated by scoring systems of the borrower (internal rating) or rating agencies (external rating) (Schulte and Horsch, 2004; Schierenbeck et al., 2008). For SMEs, scoring systems evaluate hard facts like the financial state of the firm, the profit situation and financial key figures. Moreover, soft facts or private information (both terms can be used synonymously) like the quality of the management, the tradesman's morality and the reliability of the business owner is assessed. The results allow a classification according to the

[6] The unexpected loss is measured by the Credit Value at Risk and defines the potential variance from the expected loss (Becker and Peppmeier, 2013). It is not calculated for a single loan but for the whole loan portfolio of a bank and, therefore, will not be explained in detail.

predicted ability of timely repaying the obligations as a borrower (Bösch, 2009). The above highlighted equation builds the basis for calculating the standard risk costs the lenders will charge when a loan will be provided.

For a thorough assessment of the creditworthiness, information about the borrower and the SME is needed. However, the already discussed information asymmetries of SMEs lead to difficulties in evaluating the expected probability of default of these firms. Many SMEs have no financial reporting systems and, therefore, cannot provide the hard facts needed for a thorough assessment of the creditworthiness (Beck et al. 2010; Ortiz-Molina and Penas, 2008; Berger and Udell, 1998). Moreover, soft information about the borrower can only be generated over the course of time. Especially for start-ups or young firms, soft information is not available and cannot be assessed. The given uncertainty may lead to a more cautious estimation which results in a worse probability of default and higher standard risk costs for borrowing. The same applies when SMEs cannot provide sufficient valuable collateral. Valuable collateral reduces the loss given default and therefore the expected loss and the standard risk costs. Thus, for a younger firm or start-up, a lack of collateral leads to a higher expected loss. Consequently, asymmetric information and a lack of sufficient valuable collateral can result in credit restrictions for SMEs.

According to the existing conceptual literature, the present research will assess whether the provision of a guarantee can mitigate the above mentioned credit restrictions. It is assumed that the provision of a guarantee from the guarantee bank reduces the expected loss of a borrower and makes available a loan in the first place. The guarantee of the guarantee bank provides collateral that is independent from the financial and economic situation of the borrower. In this regard guarantees from a guarantee bank are labeled secure securities. The guarantee is backed up by the Federal Government and the Federal State. This means that the default of the borrower will not have a negative impact on the value of the collateral. This raised the Recovery Rate calculated for the loan and reduces the expected loss. Moreover, the probability of default of the guarantee bank can better be assessed than the probability of default of many SMEs. Guarantee banks exist for several years and provide financial statements which allow a thorough assessment of the expected probability of default for the warrantor. Additionally, guarantee banks are public institutions which are widely related to a low probability of default in Germany.

Consequently, a guarantee from a guarantee bank can reduce the loss given default and the probability of default and therefore reduce the expected loss of a loan which allows the provision of the loan in the first place.

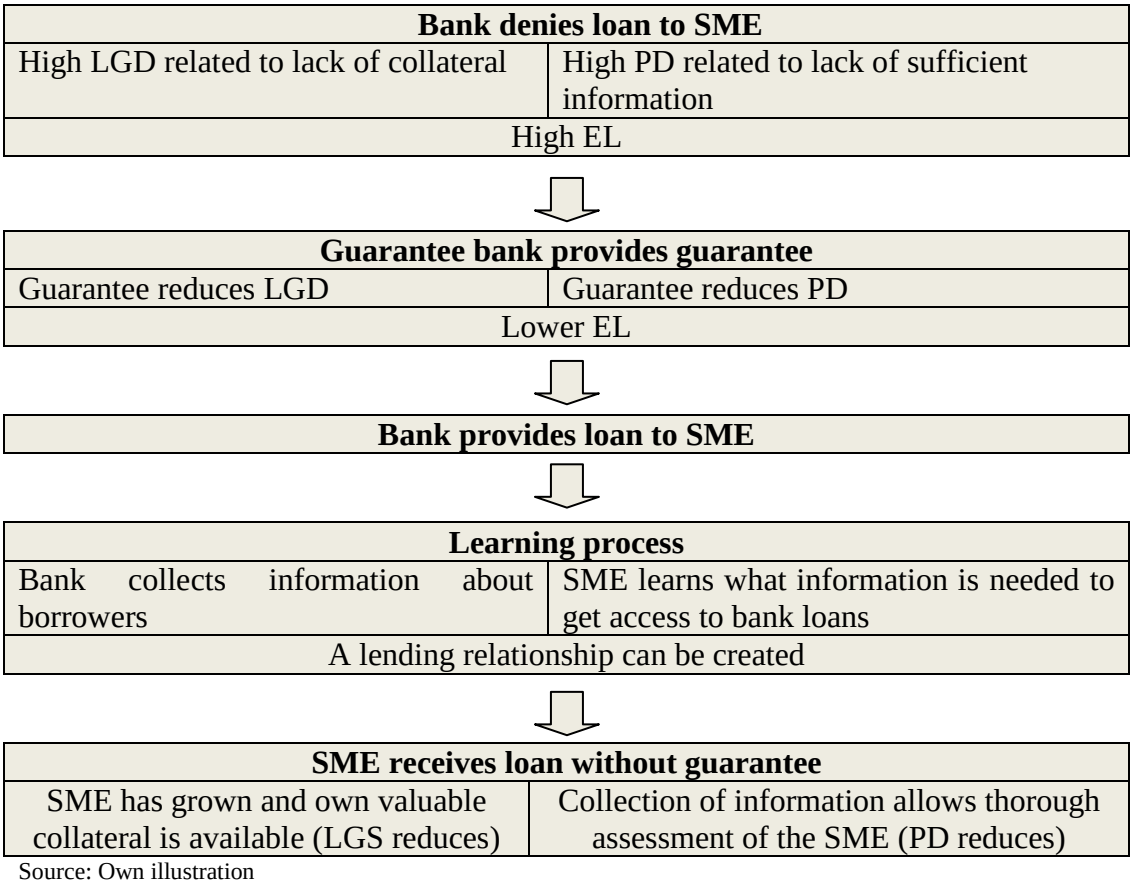
Therefore, the provision of a guarantee is expected to have a direct and immediate impact on the access to bank loans for SMEs. In this regard, the provision of a guarantee from a guarantee scheme has a short-term impact on the loan availability for SMEs. However, it is the question of whether a guarantee scheme can mitigate credit restrictions for SMEs in a sustainable way. The literature about the ability of Credit Guarantee Schemes to reduce credit restrictions is mainly concentrated on the long-term perspective. According to this, the provision of a guarantee offers the possibility to the lending banks to collect private information about the borrower. This aspect is concentrated directly on the exchange of information between the lending bank and the borrower. The exchange of information between the guarantee scheme and the borrower will not help to overcome credit restrictions in a sustainable way because Credit Guarantee Schemes do not provide loans to SMEs. Therefore, this is not considered to play a crucial role in an investigation about the ability of commercial banks in altering their lending behaviour. Credit Guarantee Schemes are merely the instrument to initiate the expected processes.

The literature review has also revealed a close connection between information asymmetries and lending relationships (Craig et al., 2008). Lending relationships between the borrower and the lender foster the lender's generation of information about the borrower (Cole, 1998). Consequently, the reduction of information asymmetries and the creation of a lending relationship can be considered as being favourable for the mitigation of credit restrictions for SMEs. Bringing this into the context of the impact of the German Credit Guarantee Scheme and its ability to alter the lending behaviour of commercial banks is the main objective of the present research which is as follows:

Research objective:
To reveal whether the provision of a guarantee from a German guarantee bank can initiate a learning process on the side of the commercial bank which helps to mitigate existing information asymmetries concerning SMEs, supports the building of a long-term customer-bank relationship and helps to overcome credit restrictions.

The objective of the present research has been derived from the detected research gaps in the existing literature about Credit Guarantee Schemes in general, the German guarantee banks in particular, and the role of information asymmetries, collateral and lending relationships. It is a combination of different factors that have not been combined and analysed so far. Based on this literature, a framework of the expected process of learning has been derived which is illustrated in figure 2.1 below.

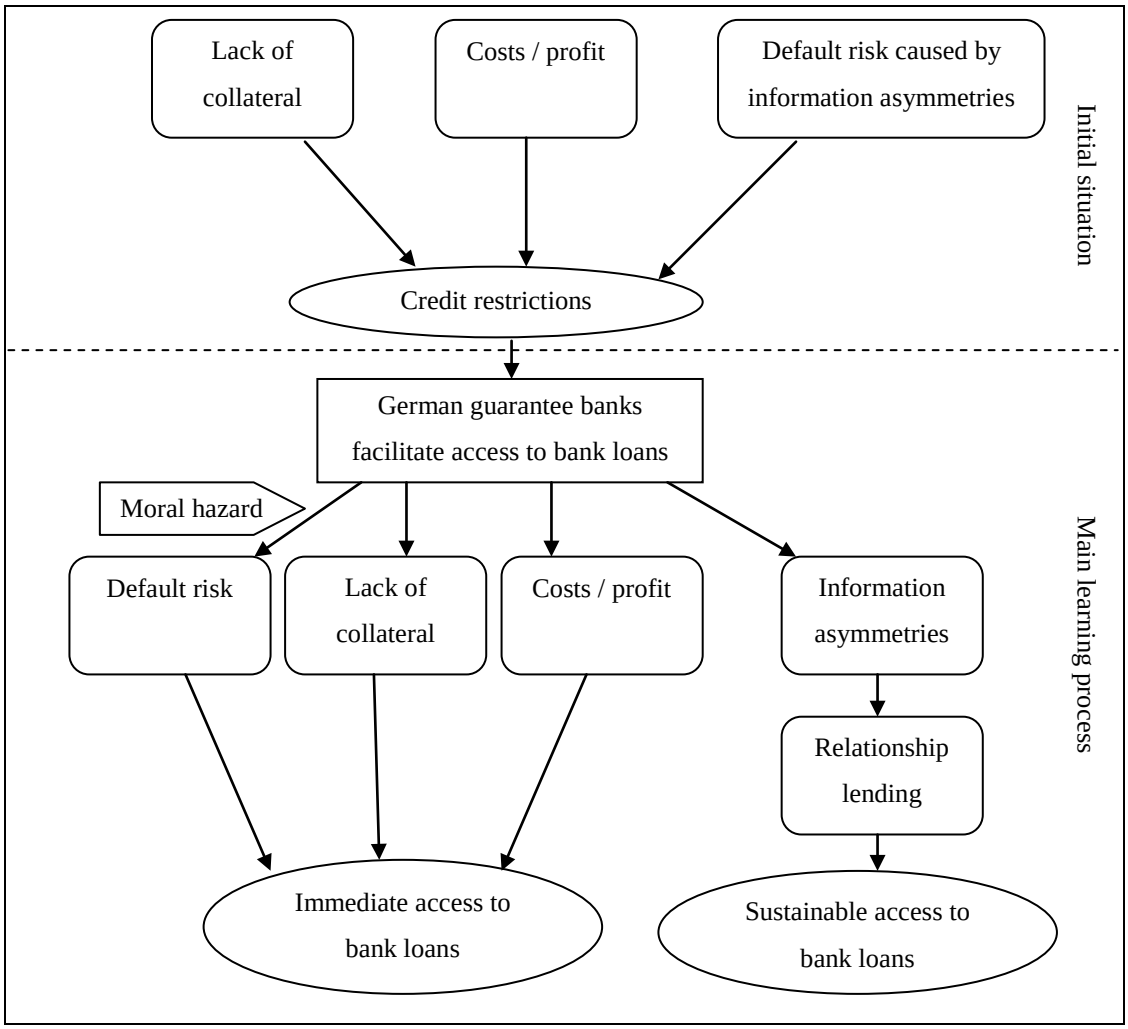
Figure 2.1: Learning process



Source: Own illustration

However, the learning process is much more complex. Therefore, Figure 2.2 is enhanced by the main key factors that are expected to play a crucial role within the learning process. The key factors are derived from the literature presented in the literature review. Each key factor is explained in more detail and the related research questions and propositions are presented in the following.

Figure 2.2: Key factors and their role within the process of learning



Source: Own illustration

A thorough assessment of the expected probability of default of a loan can be exacerbated when a SME cannot provide sufficient hard and soft information about the business. Moreover, the loss given default is higher for SMEs that cannot provide own valuable collateral. A higher loss given default and a higher probability of default result in a higher expected loss (Schierenbeck et al., 2008). When the expected loss is too high, a bank will not provide a loan to a SME. In such a situation, the lack of collateral and information asymmetries can result in credit restrictions for a SME (Reize, 2011; Beck et al., 2010; Reize, 2005). Relatively high costs related to relatively low loan amounts can also lead to credit restrictions for SMEs. SMEs typically apply for lower loan amounts than bigger firms. However, the overhead costs for assessing a loan application are the same. Therefore, SME lending is less profitable for banks (Beck et al., 2010; Bosse, 2009; Cressy, 2002). For this reason, loans to SMEs might not be provided.

In these situations, guarantees from guarantee banks might facilitate SME lending. As a consequence, this is the starting point for the present research. The first step is to evaluate why and under which circumstances guarantees from the guarantee scheme promote the provision of loans to SMEs. Consequently, this is the first research question that shall be answered in the present research:

Research question 1: For what reason and in which situation are guarantees from the guarantee bank important for the provision of loans to SMEs?

The research question will be answered by testing three propositions. The literature review and the information about SME lending provided in the introduction imply that the reasons for credit restrictions of SMEs are market imperfections that arise from asymmetric information (Stiglitz and Weiss, 1981; Akerlof, 1970). The lack of sufficient information about a borrower allows no thorough assessment of the probability of default (Beck et al., 2010; Cressy, 2006). Therefore, banks might deny loans to SMEs or make a conservative assessment that leads to a higher probability of default. Consequently, the default risk of these firms tends to be higher.

Collateral is perceived to reduce the default risk for the lending banks and to act as a signalling device for the quality of the borrowers (Berger et al., 2011b; Stiglitz and Weiss, 1981). Collateral defines the loss given default of a loan. When a borrower can provide sufficient valuable collateral, the loss given default and therefore the expected loss of a loan is lower. However, SMEs often do not have enough valuable collateral that can be pledged. This might result in restricted access to bank finance for SMEs. Credit Guarantee Schemes have been implemented to overcome these threats and to mitigate credit restrictions for SMEs (Stiglitz and Weiss, 1981; Cowling and Mitchell, 2003). The aim of the schemes is to bridge the lack of collateral and, therefore, enable otherwise credit restricted SMEs to obtain bank loans (Menkhoff et al., 2012). The provision of collateral in the form of a guarantee reduces the expected loss for the lending banks. The reduction of the expected loss may lead to moral hazard on the part of the banks because banks are more willing to provide loans to riskier projects. In addition, the inclusion of a third-party guarantee

may also increase moral hazard on the part of the borrowers (Uesugi et al., 2010; Green, 2003).

Based on the above explained assumptions, the first two propositions have been derived:

P1: SMEs have difficulties in obtaining bank loans because of a higher default risk and a lack of collateral.

P2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan.

Additionally, Credit Guarantee Schemes are considered to make SME lending more profitable by reducing administrative costs for the lending banks (Green, 2003; Manove et al., 2001). Since SMEs typically apply for relatively low loan amounts, SME lending is perceived to be less profitable than lending to bigger firms (Bosse, 2009; Riding et al., 2007). Existing conceptual literature assumes that lenders might transfer the screening and monitoring to the guarantor. This would reduce the costs for the lender and make SME lending more profitable (Green, 2003; Levitsky, 1997a). To assess whether guarantees can increase the profitability of SME lending for commercial banks, proposition 2b will be tested:

P2b: Including a guarantee from the guarantee bank makes SME loans more profitable for the banks.

The reduction of the lack of collateral and the default risk as well as the impact on the profits of the commercial banks are considered to take place in the moment the guarantee is provided and, therefore, to have an impact on the immediate access to bank finance. A reduction of information asymmetries between the commercial bank and the borrower, however, can only take place over the course of time and is considered to be one of the main factors for the bank's process of learning and a sustainable mitigation of credit restrictions for SMEs. A learning process that has been activated by the provision of a guarantee from the guarantee bank can only operate when learning on the side of the commercial banks takes place. Learning is initiated by the creation of private information. This leads to the next research question:

Research question 2:
Can the provision of a guarantee from a guarantee bank help to reduce information asymmetries between the lending bank and the borrower?

Vogel and Adams (1996) and Craig at al. (2008) described Credit Guarantee Schemes as a practical instrument to foster the production of information about the borrowers by the lending banks. To reduce information asymmetries, information about the borrowers has to be generated. The provision of a guarantee from a guarantee scheme is considered to make available a SME loan in the first place. The provision of the loan builds the basis for creating information about the borrower by the lending bank. When the exchange of information is increased over the course of time, information asymmetries might be mitigated and SME access to bank loans increased in the future. Consequently, it has to be determined whether a lending bank collects more information about the borrower after the loan has been provided. Two general types of information can be collected: hard facts and soft facts. Hard facts are mainly related to the financial situation of a firm. This information can be generated over time by regularly assessing financial key figures and observing the profit situation over the years. Soft facts are related to the quality of the management and the trustworthiness of the borrower (Bösch, 2009). This information has to be collected by steadily communicating with the borrower. The aim is to find out whether SMEs that initially needed a guarantee from a guarantee bank to obtain a bank loan can graduate to borrowers without guarantee in the future. Therefore, the research is concentrated on the reduction of information asymmetries between the SMEs and the banks that provide loans (commercial banks). The analysis of a reduction of information asymmetries between SMEs and guarantee banks will be unproductive for the present research. This would not help to answer the question about whether a process of learning on the side of the commercial banks can be initiated which results in a situation where SMEs obtain loans without the support of the guarantee bank.

It is not only important to evaluate the amount of information but also the value of the information that can be collected. Information asymmetries could only be reduced when new and useful information about the borrower can be aggregated. Whether this can really achieved has been evaluated by testing the following proposition:

P3a: SMEs provide more information and more regular information to the lending bank as a consequence of obtaining the guarantee from the guarantee bank.

The literature review has demonstrated that the reduction of information asymmetries is often related to the establishment of a lending relationship. Lending relationships help to overcome asymmetric information and might lower the requirements for collateral (Berger and Udell, 2002). Lending relationships are characterized by a close contact between lenders and borrowers. A close contact is often related to more communication and an increased exchange of information. The more a borrower talks to the bank, the more can be learned about his or her business. The lender can learn about the management qualities of the borrower. Moreover, the lender can learn whether the borrower timely discusses problems or threats for the business with the lending bank. This provides important soft facts about the borrower and helps to create a relationship of trust. Therefore, the creation or the intensification of the relationship between the borrower and the commercial bank can be considered as being supportive for the reduction of information asymmetries and vice versa. The provision of a guarantee from a guarantee scheme makes available a loan to a SME in the first place. Consequently, it builds the basis for the establishment of a lending relationship. To find out whether lending relationships can really be created as a consequence of the loan provision is part of the following research question:

Research question 3:
Has a new lending relationship been created due to the provision of the loan with guarantee?

To evaluate this, the following proposition has been tested:

P3b: Increased information supports the creation of a bank-borrower relationship.

This leads to the end of the expected learning process: the mitigation of credit restrictions for SMEs. The framework of the learning process predicts that the provision of a guarantee from the guarantee bank alleviates the main problems of restricted access to bank finance for SMEs - collateral, default risk and costs - directly. Moreover, it helps to reduce information asymmetries and the creation of a lending relationship over time. When the learning process takes place as assumed,

this will lead to a sustainable amelioration of the access to bank loans for SMEs. Therefore, the final research question is:

Research question 4: Do German guarantee banks help to overcome credit restrictions for SMEs?

The research question is phrased in a way that it addresses both, the sustainable and long-term mitigation of credit restrictions as well as the mitigation in a single case. The existing literature about lending relationships has demonstrated a positive impact on credit availability for SMEs (Petersen and Rajan, 1994; Behr et al., 2011) and on the collateral requirements (Berger and Udell, 1995; Harhoff and Körting, 1998). When a learning process takes place, banks can better evaluate the default risk of SMEs and manage SME loans more profitably (Green, 2003). Whether this takes place in the case of the German guarantee scheme has been tested with the last proposition:

P4: Guarantee banks help to mitigate credit restrictions for SMEs.

Only when all propositions can be confirmed can the learning process be confirmed as a whole.

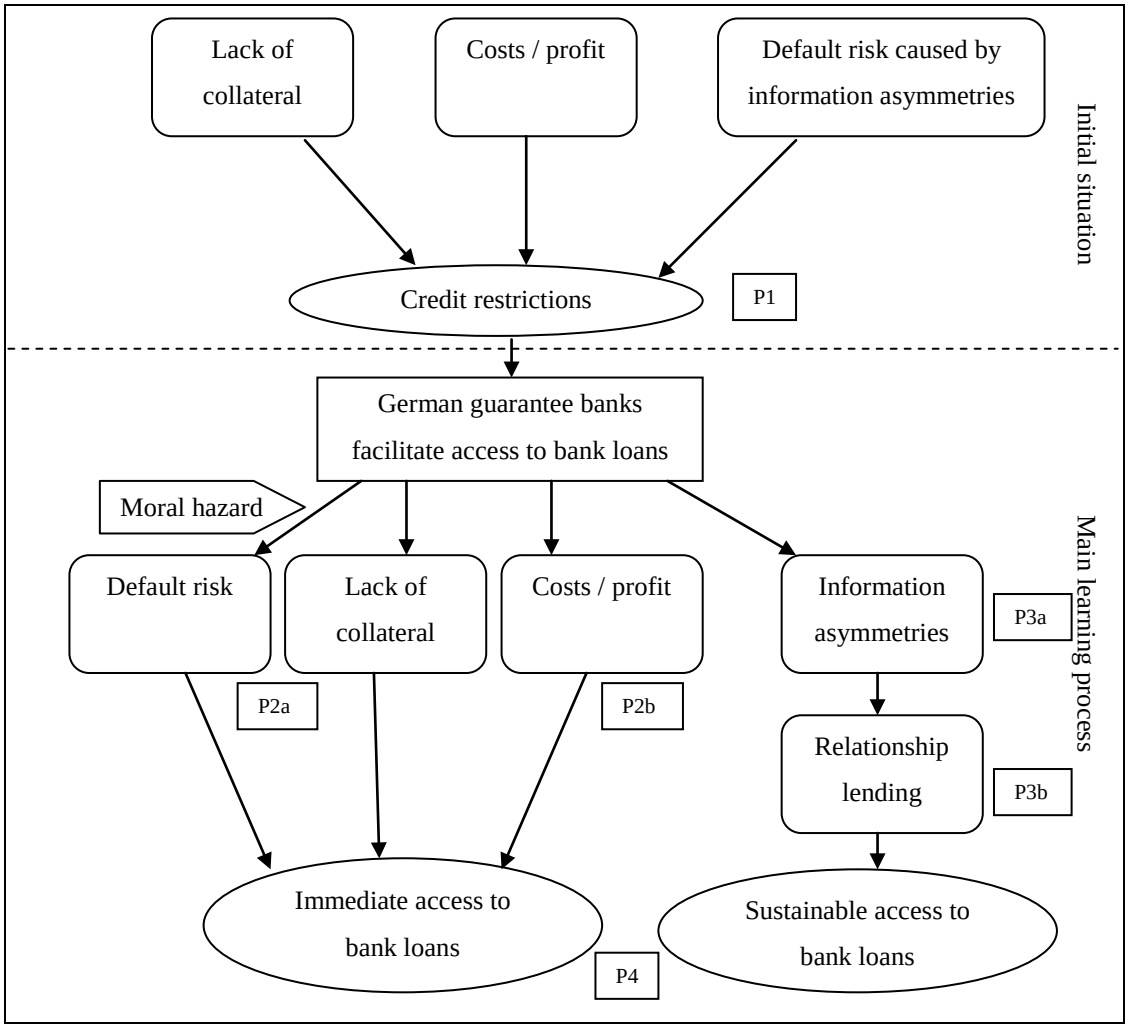
To allow a better understanding of the present research, Table 2.8 provides an overview about the research questions and propositions that have been evaluated.

Table 2.8: Research questions and propositions

Research Question	**Propositions**
For what reasons and in which situations are guarantees from the guarantee bank important for the provision of loans to SMEs?	P1: SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral.
	P2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan.
	P2b: Including a guarantee from the guarantee bank makes SME loans more profitable for banks.
Can the provision of a guarantee from a guarantee banks help to reduce information asymmetries between the lending bank and the borrower?	P3a: SMEs provide more information and more regular information to the lending bank as a consequence of obtaining the guarantee from the guarantee bank.
Has a new lending relationship been created due to the loan with guarantee?	P3b: Increased information supports the creation of a bank-borrower relationship.
Do credit guarantee schemes help to overcome credit restrictions for SMEs?	P4: Guarantee banks help to mitigate credit restrictions for SMEs.

The propositions can be integrated in the process of learning that is analysed in the present research. This allows a better understanding of the whole research aim. Figure 2.3 contains the inclusion of the research propositions in the above illustrated learning process.

Figure 2.3: Integration of the research proposition in the learning process



Source: Own illustration

2.7 Summary

The literature review has revealed the weakness of the existing research to evaluate the ability of Credit Guarantee Schemes to alter the lending behaviour of banks. A conceptual framework exists concerning the ability to alter the lending behaviour of banks. However, none of the existing research has tested whether a certain Credit Guarantee Scheme really achieves a change in the lending behaviour of banks and sustainably mitigates the credit restrictions for SMEs. This clearly illustrates the need for empirical research. To fill this gap is the main aim of the present study.

What the studies mentioned so far disregard is the question of whether banks refuse lending to all kinds of SMEs or whether banks need to learn about problems and businesses of all SMEs regardless of sector or owner characteristics. It may also be that there are some SMEs that obtain loans without any restrictions. If so, one could conclude that the lending behaviour of banks must not be altered for SMEs generally and that lending relationships are not important for SMEs in general. From another point of view this may also mean that for some SMEs the lending behaviour cannot be altered because the general conditions, of a sector e.g., may be so severe that a bank will never take the risk for a loan without guarantee even if a lending relationship would exist. This has not been tested to date.

Summing up, the present research seeks to extend the existing literature about Credit Guarantee Schemes by analysing whether a learning process, as shown in Figure 2.2, can be activated due to the existence of a Credit Guarantee Scheme. To the author's best knowledge, this process has not been analysed so far. It also expands the existing literature by concentrating on both the banks that provide the loans as well as the SMEs that obtained the loans. Besides the contribution about Credit Guarantee Schemes, the present research enriches the evaluation of the German guarantee scheme which has not been analysed much so far.

3 Research methodology and design

This section provides detailed information about the research methods that have been applied to investigate the research questions. Section 3.1 contains detailed information about methods and the methodology of the present research. Since the research applied quantitative as well as qualitative research methods, two sections illustrate the research methods that have been applied. Section 3.2 outlines the quantitative research consisting of a web survey with SMEs that have obtained a guarantee from the guarantee bank in Hesse. Section 3.3 provides information about the qualitative research that has been conducted to evaluate the significance of the guarantee banks from the commercial banks' perspective.

3.1 Research methods and methodology

The purpose of the research is to evaluate whether the provision of a guarantee from the guarantee bank can initiate a learning process on the side of the lending banks. Existing literature about SME financing has demonstrated potential reasons for credit restrictions of SMEs like higher default risk associated with SME lending (Creditreform 2013; Beck et al. 2010; Stefanovic 2009; Coco 2000), information asymmetries (Beck et al. 2010; Zimmermann 2006; Petersen and Rajan 1994), lack of valuable collateral (Columba et al. 2010; Harhoff and Körting 1998) and lower profitability for the lender (Beck et al. 2010; Bosse 2009; Ridings et al. 2007). The expected learning process is assumed to reduce asymmetric information and risk for the lender, make SME lending more profitable and facilitate the access to bank finance for SMEs. Hence, the research aims to address the difficulties some SMEs face when applying for a bank loan and to find out whether guarantee banks help to overcome these difficulties. In other words, the research addresses "…practical problems in the 'real world'…" (Feilzer 2010, p. 8). The researcher accepts that the knowledge provided by the study is not absolute but rather relative. In sum, this all is very typical for the philosophy of pragmatism (Feilzer, 2010; Scott and Briggs, 2009; Morgan, 2007). Moreover, pragmatism is typically related to research about learning within the business sector (Easterby-Smith et al., 2008). Pragmatism considers various standpoints, positions or perspectives. Pragmatists espouse to efficiently apply qualitative as well as quantitative research methods to conduct practical research (Cameron, 2011; Sommer Harrits, 2011; Johnson et al., 2007). As opposed

to positivism which is typically exclusively related to quantitative research or constructivism which is commonly related to qualitative research, pragmatism is the philosophy which is primarily related to mixed methods research (Heyvaert et al., 2013; Cameron, 2011; Mertens, 2010; Johnson et al., 2007; Bryman, 2007). In mixed methods research, qualitative and quantitative research methods are combined. The combination can occur at different stages within a research study like the formulation of the research questions or the collection, analysis or interpretation of the data (Bryman, 2006; Johnson et al., 2007). Rationales often mentioned for combining qualitative and quantitative research are the generation of a better understanding of the phenomena under investigation and to improve the value of the final conclusions (Molina-Azorín, 2011; Johnson et al., 2007; Greene et al., 2001). In the present research, a web survey with SMEs and semi-structured interviews with bank managers were conducted. The mixed methods approach was applied to combine the advantages of qualitative and quantitative research. The quantitative approach of conducting a web survey provided the opportunity to reach a larger population within a relatively short period of time (Abernethy et al., 1999; Simsek and Veiga, 2000). Moreover, it allowed ensuring anonymity which was expected to be very important for the respondents. The qualitative approach, however, enabled the researcher to learn about thinking and behaviour of the respondents (Malhotra, 2010; Saunders et al., 2009). In addition, semi-structured interviews were considered helpful to gain the trust of the interviewees and reduce the risk of response bias (Saunders et al., 2009; Easterby-Smith et al., 2008).

The research follows a deductive approach (Gill and Johnson, 2010; Saunders et al., 2009). From an extensive literature review, a framework for the expected learning process and the assumed impact on SME lending has been derived. The literature review has demonstrated that this framework has never been empirically tested. This gap shall be filled by evaluating SMEs that obtained a guarantee from a German guarantee bank as well as commercial banks that provided loans including a guarantee to SMEs. Regarding these research objects, the analysis of existing data did not seem promising. Official data about firms that received a guarantee from a guarantee bank was not available. The same applied for information about which banks have already provided loans including a guarantee from the guarantee bank. Consequently, new data had to be generated.

Regarding the evaluation of SMEs, it was decided to address all firms that received a guarantee from the guarantee bank Hesse within a predetermined period of time (more details about the sample and the time frame is given in Section 3.2.4 below). To reach a relatively "…large quantity of 'generalisable' data…" (Abernethy et al. 1999, p. 7) within a short period of time, a questionnaire approach seemed to be appropriate. In SME research, questionnaires are considered as an effective form of data collection (Newby et al., 2003; Bartholomew and Smith, 2006). Secondary published data about small businesses is scarce (Bartholomew and Smith, 2006). One of the advantages of a questionnaire is the small expense in time and cost (Simsek and Veiga, 2000). Another advantage is the fact that questionnaires are often perceived to be more anonymous than interviews. As the present research seeks to obtain information about sensitive data, anonymity is a very important factor. Additionally, it was decided to provide a self-administered questionnaire since these are considered to be more convenient for respondents as speed and date of completion can be chosen individually (Bryman and Bell, 2007; Simsek and Veiga, 2000). One disadvantage of self-administered questionnaires is that respondents have no opportunity to ask questions for better understanding (Bryman and Bell, 2007). These uncertainties can be reduced to a minimum by comprehensive pretesting (Saunders et al., 2009) which has been done in this study and will be explained in detail later. Another disadvantage is the uncertainty about who exactly answered the questionnaire (Bryman and Bell, 2007). In the present survey, respondents had to state their function within the firm. This helped to eliminate the problem.

After the decision was made to use a questionnaire for evaluating SMEs in the present research, it had to be determined how to distribute the questionnaires. This could be done by postal mail or by using the internet. For facilitating the decision, Table 3.1 was created which compared the two types of questionnaires applicable for the present research. Those rows that are highlighted in grey were considered to be more favourable.

Table 3.1: Postal questionnaire vs. web survey

	Postal questionnaire	**Web survey**
Expenditure of time (researcher)	Relatively high -working hours for printing, packing and bringing to the post office; -creating own manual statistics about responses (days, number,…) -transferring the data into a database for statistical analysis	Relatively low -working hours for sending emails -converting the electronic data to the statistical analysis tool (can be done by one click)
Expenditure of time (respondent)	Relatively high -answering questionnaire -wrapping in envelop -bringing to post office/post box	Relatively low -answering survey -sending back the survey by clicking the 'close' button (one click)
Cost	Relatively high (more working hours, letterheads, envelops, stamps)	Relatively low (working hours for sending emails, no material needed)
Anonymity	Can be given	Can be given
Convenience for the respondent	Less convenient -answering the survey -wrapping the letterhead -bringing the letter to the post office/post box	More convenient -accessing the internet -answering the survey -no need to leave the house
Risk of not being noticed by respondent	Invitation letter stays at the desk (steady reminder)	Invitation might not be read (when registered as spam mail)

Source: Own illustration, in parts adopted from Bryman and Bell (2007), Saunders et al. (2009)

For the researcher, it was important to save cost and time. The budget was limited, and it had taken a long time to get in touch with a guarantee bank that agreed to cooperate and support the research by granting access to SMEs that obtained a guarantee. Therefore, time and cost became decisive factors. Moreover, it was optional to cause as little inconveniences (measured against time and workload) as possible to the participants of the survey to enhance the response rate. A very important precondition for the evaluation of sensitive data was the reassurance of anonymity. This was possible with both types of questionnaires. Altogether, it became clear that a web survey would best meet the requirements of the researcher.

The survey provided quantitative data about SMEs that obtained guarantees. Since the research aim was to analyse the influence of guarantee banks on the creation of relationships between SMEs and banks, it was considered to be important to not only investigate the experiences of SMEs but also to evaluate the perspective of commercial banks. However, conducting another survey with bank managers was not perceived to be a proper means for obtaining the information needed. It was aspired

to understand the reasons and motivations why and under which circumstances banks insist on the provision of guarantees and whether institutions that guide SMEs on their way to receive bank loans feel any necessity and possibility for an alteration in the lending behaviour (Saunders et al., 2009; Malhotra, 2010). Learning and understanding patterns, thinking and behaviour is best gained through semi-structured interviews. Moreover, semi-structured interviews allow interaction with the participants. It becomes possible to react to interesting answers and to go deeper into a certain topic than initially planned if it seems necessary and promising (Abernethy et al., 1999; Malhotra, 2010). Moreover, banks are very reluctant to provide confidential and sensitive information due to the banking secrecy. Interviews are considered to facilitate the access to sensitive data for the researcher as participants may refuse to provide data to people they have never met personally (Saunders et al., 2009; Hesse-Biber, 2010). Meeting with bank managers face-to-face allowed the researcher to demonstrate an awareness of the sensitivity of the research questions and to better ensure the appropriate handling of the interview results. This was the main key necessary to encourage bank managers to participate in the research.

Combining a web survey and semi-structured interviews allowed a more in-depth analysis and helped the researcher to better understand the complexity of the research questions since different views had to be analysed and combined (Molina-Azorín, 2011; Johnson et al., 2007; Greene et al., 2001). This was decided to consider interests of both parties involved in a bank-borrower relationship: the SMEs and the lenders. It was important to fully understand the process of relationship development. Neither the quantitative nor the qualitative analysis can be considered dominant in the present research. Both approaches have the same importance for analysing the phenomenon of learning (Cameron, 2011; Johnson et al., 2007; Hall and Howard, 2008). The data was collected sequentially. This means that both analyses were conducted separately (Molina-Azorín, 2011; Plano Clark et al., 2010; Cameron, 2011; Johnson et al., 2007; Onwuegbuzie and Johnson, 2006; Gilbert, 2006). The different time frames of the qualitative and quantitative research do not represent any hierarchy in importance as both provide comprehensive and discrete research findings. The research followed a coordinated design (Greene et al., 2001). The primary connection of the results from different methods happens in the final stage when drawing conclusions (Johnson et al., 2007; Bryman, 2006).

3.2 Web survey

The following sections will provide more detailed information about the web survey of the present research. Section 3.2.1 highlights the structure of the survey. It also illustrates the link between the particular questionnaire sections and the main propositions of the research. Section 3.2.2 discusses data quality. Section 3.2.3 provides details about the pilot tests that were undertaken before the survey was sent out to the SMEs. A detailed explanation about the selection of the sample and the distribution of the invitation letters is contained in Section 3.2.4. Section 3.2.5 provides information about the response rate and Section 3.2.6 deals with the issue of nonresponse bias. Finally, Section 3.2.7 presents basic information about the analysis of the collected quantitative data.

3.2.1 Design

The survey is divided into four main parts. It starts with an explanation of the purpose of the research, an assurance to treat the answers confidentially and the contact details of the researcher. This is considered to be necessary to gain the trust of the participants and to encourage answering (Simsek and Veiga, 2001; Porst, 2009). Each part begins with a short introduction explaining its contents. The first part contains entry level questions which should attract the attention of the participant and underline the fact that the research really reflects the concerns of small firms (Porst, 2009). The second part is about the influence of guarantees on the access to finance for SMEs. The information behaviour and lending relationship is covered in part three, and part four contains general questions about the firm. The web survey including a translation in English is presented in Appendix I. Table 3.2 presents the relationships among the research questions, propositions and parts of the questionnaire and highlights main issues asked in every section.

Table 3.2: Research questions, propositions and related questionnaire parts

Research Question	**Proposition**	**Questionnaire Section**	**Main issues**
For what reasons and in which situations are guarantees from the guarantee bank important for the provision of loans to SMEs?	P1: SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral.	Part I: Access to bank finance (question 1)	Difficulties in obtaining bank loans
		Part III: Bank-borrower relationship (question 5)	Bank
		Part IV: General information about the firm (questions 1 – 7)	Firm characteristics: Age, legal form, sector, headcount, education
	P2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan.	Part II: Loan provision and guarantees of a guarantee bank (question 3 e)	Significance of guarantee for receiving a loan
	P2b: Including a guarantee from a guarantee bank makes SME loans more profitable for banks.	*Is concerned with the bank´s side of view and therefore will be evaluated by interviews only*	
Can the provision of a guarantee from a guarantee bank help to reduce information asymmetries between the lending bank and the borrower?	P3a: SMEs provide more information and more regular information to the lending bank as a consequence of obtaining the guarantee from the guarantee bank.	Part II: Bank-borrower relationship (questions 3c and 3d)	Amount and regularity of information provided
Has a new lending relationship been created due to the loan with guarantee?	P3b: Increased information supports the creation of a bank-borrower relationship.	Part II: Loan provision and guarantees of a guarantee bank (question 3 f)	Relationship after receiving a guaranteed loan
Do German guarantee banks help to overcome credit restrictions for SMEs?	P4: Guarantee banks help to mitigate credit restrictions for SMEs.	Part II: Loan provision and guarantees of a guarantee bank (questions 4 and 5)	Loan renewal without guarantee

The questionnaire has a total of 20 questions with three filter questions. Closed-ended questions dominate and additional information about how to answer a question has been given when necessary (e.g. when more than one answer is possible).

Instructions are very clear and simple and the questionnaire layout was thoroughly designed. Every page is reduced to a minimum of questions which makes scrolling unnecessary. The intention was to keep the questionnaire as short as possible to encourage response and completion (Saunders et al., 2009; Dolnicar et al., 2011; Simsek and Veiga, 2001, 2000) without neglecting important issues. An expected completion time of approximately 10 minutes is stated in the introduction. At the end of the questionnaire, contact name and address are provided for any queries the respondent may have, and the possibility is offered to receive the results of the research when available. The questionnaire is closed by thanking respondents for their participation (Saunders et al., 2009).

3.2.2 Data quality in quantitative research

In quantitative research, the collection of accurate and consistent data is a central aim. Accuracy and consistency are especially related to validity and reliability. Another aim is results of one study that can be applicable to other research settings.

Reliability

Reliability is concerned with the extent to which measures applied in the research produce consistency. In other words, it shows the robustness of a questionnaire (Malhotra, 2010; Saunders et al., 2009; Bryman and Bell, 2007).

One of the methods most commonly used to measure reliability is the test-retest method (Dolnicar et al., 2011). In test-retest reliability, identical sets of measures are provided to the same respondents at two separate times under as similar conditions as possible. To determine the similarity between the two tests, correlation coefficients are computed. Several weaknesses of the test-retest method exist wherefore this method is not generally recommended. First, the value of the reliability coefficient depends on the time between the first and the second measurement. For longer time intervals, lower correlation coefficients are expected. Second, the initial measurement may change the respondent's behaviour or thinking. This exacerbates a comparison with the second measurement. Third, the test-retest method may not be compatible with the overall research aim. When the initial reaction to a new phenomenon shall be tested, for example, a second measurement is not suitable. Lastly, the reliability coefficient contains correlations of each item with itself. Therefore, correlations tend to be higher than correlations between different items

(Malhotra, 2010; Peter, 1977). Regarding the present research, test-retest was not a suitable method to assess reliability. Besides the weaknesses mentioned above, German SMEs are known to be very reluctant to answer questionnaires (Becker and Ulrich, 2009b; Piontkowski, 2009). Requiring respondents to answer a questionnaire twice instead of once would, therefore, reduce the willingness to take part in a survey.

This is also the reason why alternative forms reliability was not tested in the present research. To assess alternative forms reliability, the same respondents are measured with two different scales or instruments at different times. To evaluate whether the same respondents gave similar answers, the scores are correlated. The two scales or instruments need to be as similar as possible. This is the main limitation of the alternative form reliability (Malhotra, 2010; Peter, 1977).

Since it was not possible to administer the same or an equivalent set of scales twice, internal consistency reliability has been tested. The basic idea of this method is to split measures containing multiple items in two halves and to compute correlations for the two halves. This measure is known as split-half test. High internal consistency can be confirmed by high correlations (Muijs, 2011; Malhotra, 2010). The problem of the split-half method is its dependence on the results on the way scale items are split. Cronbach's coefficient alpha provides a useful method to overcome this problem (Malhotra, 2010; Dolnicar et al., 2011). To compute Cronbach's alpha, the scale items are split in different ways and the average of all possible split-coefficients is calculated (Malhotra 2010). In the present research, Cronbach's alpha has been computed for the core questions about the learning effect to estimate internal consistency reliability. According to literature, the coefficient alpha has to be over 0.7 to prove internal consistency (Bryman and Bell, 2007; Malhotra, 2010; Muijs, 2011). The alpha value for the questions about the learning effect is 0.745. Regarding the required value of 0.7 mentioned above, this result demonstrates satisfactory internal consistency for the present research.

Validity

Reliability is a necessary condition for validity. If a measure appears to be unreliable, it will not be valid (Bryman and Bell, 2007; Gill and Johnson, 2010). To achieve a perfect validity, it is important that no measurement error exists (Malhotra 2010).

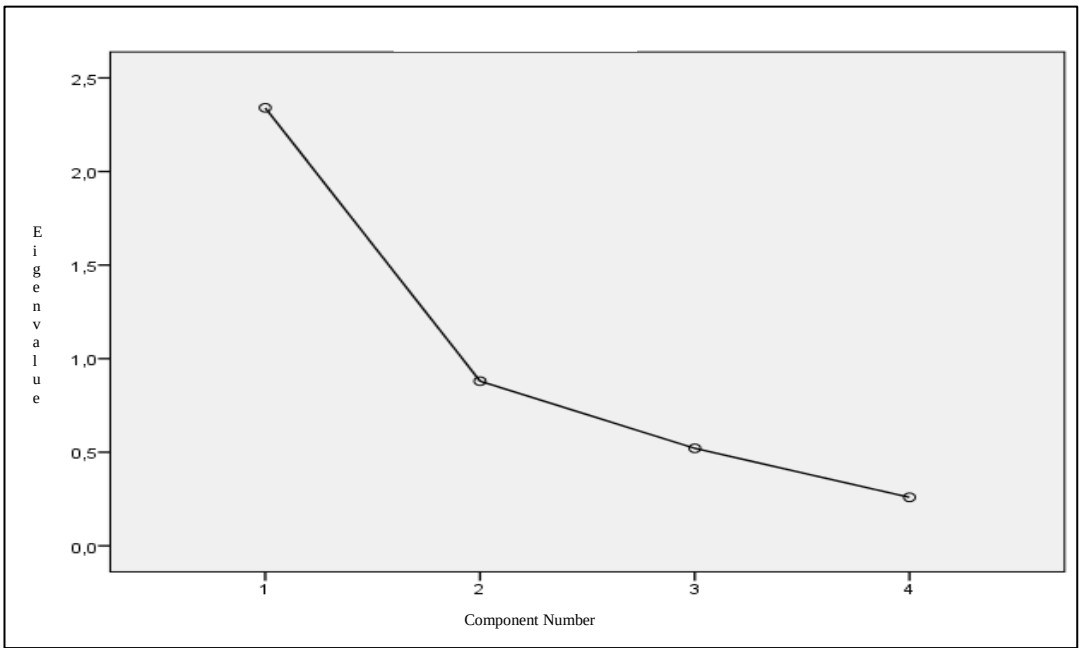
According to existing literature, mainly three types of validity can be distinguished: content validity, criterion validity and construct validity (Muijs 2011; Malhotra 2010; Saunders 2009).

Content validity in survey design is an evaluation about whether the questions of a questionnaire are appropriate for measuring what is intended to be measured. To become able to judge adequate research instruments, it is important to thoroughly review existing literature and carefully deduce the research from existing theories (Muijs 2011; Saunders 2009). This has been done in the present research. The research started with conducting an extensive literature review. From existing theories and concepts, the research objectives and propositions have been derived. Another possibility to assess content validity is asking experts or potential respondents to comment on the questions. This is widely known as face validity (Muijs 2011; Malhotra 2010; Saunders 2009). In the present research this has been done by conducting extensive pilot testing which is explained in Chapter 3.2.3 in more detail. As a first step, the questionnaire was sent to an expert group to analyse the appropriateness of the contents and to receive recommendations for amendments. In a second, SMEs were asked about their understanding of the questions. In a third step, completion time and the way of answering to the questions was discussed. The examples above demonstrate that content validity is a rather subjective evaluation. For that reason, the evaluation of criterion and construct validity is useful to obtain a more formal assessment (Malhotra 2010).

Criterion validity is the evaluation of the relationship between test scores and a measurable practical performance criterion (Gebotys, 1999). It can be subdivided into concurrent validity and predictive validity. Predictive validity will be assessed when future behaviour of respondents shall be predicted, for example. This can be done by comparing data collected on the scale at one time with data collected on the criterion variables at a later (future) time. This is often done by running correlation analyses (Malhotra 2010; Saunders 2009). Since this was not an issue for the present research, predictive validity has not been evaluated. If data on the scale and data on the criterion variables are collected at the same point in time, concurrent validity coefficients might be assessed. This method can be used when a concurrent criterion shall be measured by the test scores (Gebotys, 1999).

Since the aim of the present research is to analyse the ability of guarantee banks to initiate learning on the bank's side, the evaluation of construct validity seems to be appropriate. Learning is a behaviour domain which cannot be seen or adequately be represented by a certain criterion. Therefore, it is important to ascertain that the theoretical construct of learning has been well operationalized by the measurement applied. This can be done by assessing construct validity (Shephard, 1993; Gebotys, 1999; Malhotra, 2010; Abernethy et al., 1999; Gill and Johnson, 2010; Bryman and Bell, 2007). Following existing literature, construct validity has been evaluated by using principal component analysis for the questions about the learning effect (part III, question 3 a-f) (Williams et al., 2010; Williams and Vaske, 2003). In factor analysis, assessment of the sample plays a crucial role. Suggestions about the required sample size to complete a factor analysis vary widely (Williams et al., 2010; Matsunaga, 2010). However, regarding the results of the factor analysis, the sample size of 157 can be considered as being suitable (Sapnas and Zeller, 2002; MacCallum et al., 1999). Moreover, sample suitability has been assessed by computing Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity. At 0.655, the Kaiser-Myer-Olkin index can be considered suitable for factor analysis. The same applies for the Barlett's Test of Sphericits (Approximate Chi-Square 197.093 , df 6, Sig. 0.000) (Williams et al., 2010). If the construct that shall be measured is well operationalized, the factor analysis will ideally end with a 1-factor-result to confirm construct validity (Gebotys 1999; Williams et al. 2010). To determine factor extraction, Kaiser's criteria (eigenvalue > 1), the scree plot, and the cumulative per cent of variance extracted have been considered (Williams et al., 2010; Gebotys, 1999). The principal component analysis resulted in a one-factor solution with one component presenting an eigenvalue of > 1. All other components showed an eigenvalue of 0.880 or below. The factor explains a variance of over 50 per cent. The scree plot presented in Figure 3.1 supports the one-factor solution showing a clear elbow with a distinct break between the first and the other factors.

Figure 3.1: Scree plot



The results of the one-factor-solution are highlighted in Table 3.3. The figure demonstrates that each factor loading is greater than the required 0.4 (Matsunaga, 2010). The one-factor solution meets the requirements of containing at least two (Williams et al., 2010) or four items (Henson and Roberts, 2006) to allow meaningful interpretation (Williams et al., 2010; Henson and Roberts, 2006).

Table 3.3: Results of the factor analysis

Item	**Loading**	**Explained Variance**	**KMO**
Amount information	0.880	58.509%	0.655
Intervall information	0.775		
Significance guarantee	0.528	**Eigenvalue**	**Significance (Barlett)**
Relationship	0.829	2.340	0.000

Extraction Method: Principal Component Analysis

The factor loadings demonstrate that the four items can reasonably be pooled in one factor that measures whether learning on the side of the commercial banks can take place.

Generalizability

Generalizability is also referred to as external validity. It is concerned with whether the findings of one study may also be appropriate for other populations or settings (Bryman and Bell, 2007; Malhotra, 2010; Easterby-Smith et al., 2008). The present research is concentrated on the guarantee bank in Hesse. However, since the design

of all German guarantee banks is nearly the same (Langer and Schiereck 2002; Schiereck 2002; Schmidt and van Elkan 2006), the research frame as well as results can be transferred to the other guarantee banks. Moreover, the general aim to support SMEs on receiving loans that these firms would not have obtained without a guarantee is the same for many Credit Guarantee Schemes throughout the world (Riding et al. 2007; Zecchini and Ventura 2009). Therefore, the present research can also be applied for schemes in other countries.

3.2.3 Pilot testing

Before starting data collection an extensive pilot study was conducted to reveal technical problems, misunderstandings, missing items or resistances (Bryman and Bell, 2007; Kirchhoff et al., 2010; Simsek and Veiga, 2001). The pilot study was divided into three main stages. According to Saunders (2009), at first, the link to the online questionnaire should send out via email to an expert group. This group was comprised of two university professors and lecturers, two bank managers, four consultants from different chambers of commerce and one chief executive of a guarantee bank. At that stage, the contents and suitability of the questionnaire were checked, and suggestions for additional questions or changing the response spectrum were made. Moreover, the technical procedure was tested to ensure that the online survey operated well and deployed filter really functioned. All nine experts replied and gave online comments about the questions and the technical process. The first two of them stated that the button for finishing the questionnaire did not work. So this was changed, and the following comments did not mention this problem again. Besides this, the experts' comments resulted in adding a question about the purpose of the loan and in rephrasing some questions for a more precise wording.

Second, the online questionnaire was sent out via email to three SMEs to further test whether the technical changes worked. More importantly, these were the first pretests with SMEs. These tests were important to learn about the comprehensibility of the questions for the firms and the acceptance of the online survey. There were no problems with the technical process. However, the comments about the questions received online did not allow to find out whether the firms really got the questions right and would be willing to answer. For that reason, in the third stage of the pretesting the SMEs were contacted personally. This was aexpected to get a more

precise picture about how well questions were understood and whether some questions might be considered as too sensitive. Therefore, the online questionnaire was printed and handed over to 14 SMEs. This allowed the research to discuss the questions with each of the pretest participants face-to-face. This ended in deleting some technical words but required no major changes of the questionnaire.

As result of the 26 pretests, the technical process was optimized, some questions and answers were added and some questions were rephrased. This was a continuous process to ensure that all changes have been tested in the end before sending out the final questionnaire. The pilot was conducted with people that are not members of the subsequent sample (Bryman and Bell, 2007).

3.2.4 Distribution and sample

Official secondary data about SMEs that received a guarantee from a guarantee bank in Germany is scarce. Annual reports from the guarantee banks and the Association of German Guarantee Banks present data about the amount and volume of guarantees provided, but due to the German banking secrecy, it was a challenge to find out which firms received a guarantee and to contact them. Finally, the guarantee bank in the state of Hesse agreed to support the research. Hesse is one of the sixteen federal states and is located in the middle of Germany. Measured against spending capacity, productivity, economic output and taxable capacity, Hesse is on the fourth place in the actual ranking of all federal states. However, measured against economic development, research and development and employment, it is only number 12 (Institut der deutschen Wirtschaft Köln [Institute of German Economy Collogne], 2011). Considering the provision of guarantees of all guarantee banks in Germany, the guarantee bank in Hesse also ranks in twelfth place (Verband Deutscher Bürgschaftsbanken, 2011). SMEs are known as engines of economic growth and account for a high degree of dynamism and innovation (Geisen and Hebestreit, 2009). To maintain good economic output and productivity Hesse should enhance its economic development and innovation strength. The guarantee bank Hesse might help to reach these aims by enabling SMEs to make necessary investments or establish new firms. Concentrating the research on the guarantee bank in Hesse might give an insight into the ability of the bank to support the economic

development of the state. Later on the results can be used as a kind of blueprint to be transferred to other guarantee banks.

Out of those SMEs that have received one or more guarantees from the guarantee bank of Hesse between 2003 and 2008, altogether 952 SMEs have been included into the research. According to the guarantee bank of Hesse, all of these firms still existed in spring 2011. Data about the total number of SMEs that received at least one guarantee within that timeframe (including those firms that died in the meantime) was not accessible. This timeframe has been selected to avoid effects of the financial crisis on the results. In the beginning of May 2009 the German government passed the so-called 'Wirtschaftsfonds Deutschland' to enhance access to credit to firms suffering from the impacts of the crisis. The passage contained several arrangements to extend the benefits of the guarantee banks. For a limited period of time, guarantee banks were allowed to provide guarantees up to 90 per cent of the initial loan amount (previously it was up to 80 per cent) with a maximum guarantee rate of 2 million euro (previously it was 1 million euro). Moreover, it was possible to provide guarantees not only to healthy firms but also to those that really suffered from the crisis (e.g. firms with severe liquidity shortages). This measures were limited until 31 December 2010 (Federal Ministry of Economy and Technology, 2010). Since these were merely temporary regulations, data from 2009 and 2010 would not represent the ordinary circumstances which should be the subject of the research.

To satisfy the regulations of the banking secrecy, no names or address details of the contacted SMEs have been provided by the guarantee bank. One problem occurred after discussing the data availability of the guarantee bank: the guarantee bank Hesse had no email addresses of the SMEs that received a guarantee. Based on the assessment of the advantages and disadvantages of web surveys and postal questionnaires demonstrated in Section 3.1, it was decided to conduct a web survey. The easiest way to do this would have been sending emails including the link to the survey to every firm. However, since the method assessment had revealed that the risk of respondents not noticing the questionnaire was higher for web surveys, the lack of email addresses offered some interesting ways to overcome this weakness. It was decided to send out postal invitation letters to the firms instead of emails. This created the advantage of the physical presence of postal invitations. The letter remained on the desk of the recipient and, therefore, regularly reminded him or her to

answer the questionnaire. E-mail invitations were more likely to be overlooked due to daily e-mail overload (Simsek and Veiga, 2001; Newby et al., 2003; Lozar Manfreda et al., 2006).

The invitation letter contained a short introduction on the purpose of the survey, an introduction to the researcher, an explanation about how the potential respondents had been selected and an assurance to treat all answers confidentially. The letter was printed on letterhead of the guarantee bank Hesse and signed by the two chief executive officers of the guarantee bank Hesse. To demonstrate the scientific background of the research and the connection to a German university, the logo of Technische Hochschule Mittelhessen University of Applied Sciences was also printed on the letter. This was to provide trust in the research and to avoid concerns about data privacy (Simsek and Veiga, 2001; Cho and LaRose, 1999; Lozar Manfreda et al., 2006; Gill and Johnson, 2010). Moreover, including university and organization sponsorship were expected to increase response rates (Simsek and Veiga, 2001; Newby et al., 2003). The invitation letter contained the link to the survey. The link was established on the webpage of the guarantee bank Hesse (www.bb-h.de) which can be considered as being well known by those firms that have received a guarantee from the guarantee bank. This was decided because the firms considered the guarantee bank to be trustworthy and the research project would be positively associated with the bank, hopefully stimulating their willingness to respond (Cho and LaRose, 1999). To reduce the threat that people outside the sample might reply to the questionnaire, a unique password was required to get access to the survey (Simsek and Veiga, 2001). The password was communicated in the invitation letter. A screenshot of the webpage with the link to the questionnaire is included in the Appendix III.

The first invitation letter was dispatched in May 2011. After two weeks the response rate was rather low, so a follow-up letter was dispatched. Because of the given anonymity, it was not known who exactly had completed the questionnaire at this point of time. For that reason, the reminder was sent out to all 952 SMEs. Follow-up letters are widely considered as an effective means to increase the response rate (Bartholomew and Smith, 2006; Saunders et al., 2009; Newby et al., 2003) and it also works in the present research. The first reminder is widely assumed to be most effective (Newby et al., 2003; Westhead and Cowling, 1998; Kanso, 2000). For this

reason, solely one follow-up letter was dispatched. It was also distributed by the guarantee bank. To enhance the respond rate a monetary incentive (an online voucher at amazon.de for 25 euro) has been promised for ten out of the first 30 respondents as well as a deadline for answering has been placed. To ensure anonymity of those who wanted to take part in a price draw they were requested to send an email to the secretary of Technische Hochschule Mittelhessen after finishing the survey. This was to ensure confidentiality by preventing that the researcher herself knows the names of those who answered. The follow-up letter is shown in Appendix IV.

Since many authors confirm that incentives can have at least a small positive impact on the response rate (Church, 1993; Saunders et al., 2009; Teisl et al., 2005) it was decided to try a monetary incentive to increase the response rate of the survey. Indeed, the rate increased significantly after dispatching the follow-up. However, only around 13 per cent of all respondents sent an email to take part in the lottery. This indicates that in the present research the monetary incentive was not crucial for answering the questionnaire.

3.2.5 Response rate

Achieving an acceptable response rate is a fundamental aim of every survey. Saunders et al. (2009) mention a likely response rate of 11.0 per cent or lower in online surveys. Some studies refer to average response rates of between 19.3 and 76.5 per cent (Simsek and Veiga, 2000) or between 27.0 and 56 per cent (Bartholomew and Smith, 2006) in SME research. However, it seems that none of these studies mentioned has been conducted in Germany. Since the present study is concentrated on SMEs in Germany, response rates of comparable German studies seems to be more suitable to assess the response rate. Analyzing German studies reveals much lower average rates (Piontkowski, 2009; Becker and Ulrich, 2009b). Becker and Ulrich (2009b) compared published studies in SME research between 1981 and 2008. They found an average response rate of 16.4 per cent with a maximum of 39.9 per cent and a minimum of 7.0 per cent. Considering studies since year 2000 only, the average rate is even lower (13.8 per cent). Piontkowski (2009) encouraged firms to answer his survey personally or with the aid of banks. His efforts resulted in a response rate of around 15 per cent whereof only 5.6 per cent

have been SMEs. Compared to these results the response rate of the present study, which is presented in Table 3.3, can be considered as good.

Table 3.4: Detailed presentation of the response rate

	Numbers	**Per cent**
Invitation letters dispatched	952	100.00%
Responses	174	18.28%
- not filled in	9	0.95%
- only poorly answered and unusable	8	0.84%
Evaluated	157	16.49%

3.2.6 Non-respondent bias

To ensure external validity and generalizability of the survey results, it has to be analysed whether the findings would have been different when the response rate was 100.0%. The existence of differences between respondents and non-respondents is known as non-respondent bias (Malhotra, 2010; Saunders et al., 2009; Lindner and Wingenbach, 2002). One way to test this is to compare answers of respondents to those of non-respondents (Lindner and Wingenbach, 2002; Lindner et al., 2001; Miller and Smith, 1983). Due to the banking secrecy, details about the SMEs that have been contacted to answer the survey were not available for the researcher in the present research. Therefore, a comparison between respondents and non-respondents was not possible. However, since some recent literature has revealed that late respondents are similar to non-respondents (Miller and Smith, 1983; Newman, 1962), a comparison between early and late respondents has been undertaken to warrant external validity and generalizability of the present research. To define late respondents, the recommendations of Lindner et al. (2001) were followed. The authors suggested (p. 52):

> "(…) that late respondents be defined operationally as those who respond in the last wave of respondents in successive follow-ups to a questionnaire (…)".

The authors additionally recommended that the number of late respondents should not be less than 30 persons. In applying these recommendations, late respondents were defined as those SMEs that answered after the follow-up letter was sent out which were overall 93 firms. The answers of the late and the early respondents have

been compared by running chi-square tests. The results revealed no essential differences between the two waves and therefore confirm that there are no major problems with external validity and generalizability. All results can be seen in appendix V.

3.2.7 Data analysis

Data from the web survey has been analysed by using the software SPSS. As a first step, univariate analysis was undertaken to give an impression about the frequency distribution of answers and to enable statements about the representative status of the sample. Propositions were tested by using bivariate and multivariate analysis. The bivariate analyses mainly contained tests about the association between two variables. Dependent on the scale of the variables, different statistical measurements existed and had to be applied (Bryman and Cramer, 2009; Kinnear and Gray, 2008; Bühl, 2008). As a consequence, contingency tables and chi-square test were conducted. When pairs of different measures were analysed, the lower measurement level recommended was used (Bryman and Cramer, 2009). Appendix VI contains an overview of variables used for statistical analysis, the corresponding question within the web survey and its scales.

Contingency tables and chi-square tests have been computed to evaluate expected relationships between two variables. Within the contingency tables, the independent variables are presented across the tables and column percentages are illustrated (Bryman and Cramer, 2009). The total sum within the last column can differ from the overall number of evaluable responses (157) since it contains only those respondents that answered both questions under investigation. The chi-square statistic tested the null hypothesis of no association between the two variables. For a valid null hypothesis, observed and expected frequencies within the table "…should not differ by more than chance" (Ingersoll, 2010, p. 2). High differences result in high chi-square values and indicate a stronger statistical relationship (Ingersoll, 2010; Bühl, 2008). The chi-square test is a non-parametric statistic. It is also known as Pearson chi square test. It can be used for data that becomes nominal or ordinal due to categorization (McHugh, 2013). For an appropriate use, some requirements or assumptions have to be met. These assumptions include, for example, that variable categories have to be mutually exclusive. In addition, no more than 20 per cent of the

expected frequencies within the cells should be less than 5 and no expected frequency should be less than 1 (Bühl, 2008; Bryman and Cramer, 2009; Brosius, 2006; McHugh, 2013). In the present research, this assumption has mainly been met by categorizing variables. The categorization of variables often resulted in 2x2 tables. However, in very few cases, the required minimum limit of 20 per cent of the expected frequencies of less than 5 was not met. In these cases, the exact percentage is stated, and the results of the contingency tables are used for a descriptive analysis of the relationships. When the minimum level is not met in 2x2 tables, Fisher's exact test (two-sided; to evaluate a general relationship) is illustrated instead of Pearson's chi-square test (McHugh, 2013; Lydersen et al., 2009; Bühl, 2008; Freeman and Campbell, 2007). For variables with high chi-square values (resulting from high differences between the observed and the expected frequencies within the cells) which turned out to be statistically significant, further investigation was conducted to evaluate the strength of association (McHugh, 2013; Malhotra, 2010; Brosius 2006). In the present research, Phi for 2x2 tables and Cramer's V for tables larger than 2x2 were computed (Malhotra, 2010; Bühl, 2008, Brosius, 2006).

Multivariate analysis in the form of a cluster analysis was applied to divide the sample into groups that were homogeneous in respect to the stability and degree of the relationship between the lending bank and the borrower before the loan with guarantee from a guarantee bank was provided. This allowed a grouping of firms according to the existing lending relationship: firms that had a long relationship with their bank and those that had no existing relationship with the bank at the time they have received the loan as well as SMEs with regular contacts to their bank managers and with rather rare contacts. This was done by using hierarchical cluster analysis. Hierarchical cluster analysis was conducted by applying the widely used Ward's method. In Ward's procedure, means for all variables are calculated for each cluster. In a next step, the squared Euclidean distance to the means of the clusters is computed, and the sums of the distances are built for all cases. Those clusters are merged that show the smallest growth of the squared within-cluster distance. The clustering allowed the unique creation of four different groups: firms with an existing relationship to their bank were called 'Old Hands'. Firms that had no relationship to the lending bank were called 'Rookies'. In addition, firms with rare contacts to the bank before applying for the loan received the label 'Reserved'. Firms with a very close contact were labeled 'Present'. The clustering ended in a four-cluster-solution

composed of the following four clusters: 'Present Old Hands', 'Reserved Old Hands', 'Present Rookies' and 'Reserved Rookies'. Cluster analysis allowed a deeper analysis of the significance of lending relationships for SMEs and the impact of existing relationships on the loan availability and the need for a guarantee from a guarantee bank.

3.3 Semi-structured interviews

To obtain a more comprehensive picture of the impact of guarantee banks on SME lending, it is necessary to learn about the bank's reasons and motivation for insisting on a guarantee when providing a loan to a SME. This can best be done by conducting semi-structured interviews. This is underlined by Saunders et al. (2009), p. 324:

> "Where it is necessary for you to understand the reasons for the decision that your research participants have taken, or to understand the reasons for their attitudes and opinions, you are likely to need to conduct a **qualitative interview**."

As the aim was to understand why banks require guarantees from guarantee banks for some loans and how they would estimate the information behaviour and the establishment or intensification of lending relationships, a qualitative interview seemed to be most promising. To send out questionnaires to bank managers engaged in SME lending was not expected to be expedient. The researcher's working experiences at different banks in Germany for around nine years suggested that questionnaires are rarely answered by the persons researchers addressed. However, it was considered to be very important to get in contact with those persons in banks that make the initial loan decision and that have the closest contact with the SMEs. Therefore, a qualitative interview approach was chosen.

The following sections will provide detailed information about the semi-structured interviews. Section 3.3.1 contains an explanation of how the interviews were conducted, the use of an interview guide and the link between the interview sections and the main propositions of the research. Section 3.3.2 discusses aspects of data quality. Section 3.3.3 is about the piloting of the interviews. Section 3.3.4 provides information about the interviewees, and Section 3.3.5 discusses aspects of interviewer and response bias. Finally, Section 3.3.6 explains how interview transcripts have been analysed.

3.3.1 Interview guide

Semi-structured interviews are non-standardised and allow the researcher to directly respond to the answers given. Even though a guideline with subjects and questions to be covered exists, the interviewer is free to change the order of questions asked, broach a subject again and add or omit questions depending on the interview situation (Saunders et al., 2009; Bryman and Bell, 2007; Malhotra, 2010).

The interviews were carefully prepared. After an appointment was fixed, every participant received a short list of the main interview subjects as well as a short description of the research aim. This was something most participants expressly asked for when they were invited for an interview. The short description gave the participants the opportunity to prepare for the interview and collect useful information in advance if necessary. An interview guide was prepared to facilitate the interview for the interviewer and to reduce the risk of forgetting subjects. The interview guide followed a logical order beginning with questions that were considered to be easy to answer and not very sensitive. Questions that were considered to be more sensitive were put at the end of the interview. This enabled the interviewer to gain the trust of the interviewee in the course of the interview and to ask sensitive questions later on (Harvey, 2011; Richards, 1996). Nevertheless, it was not considered as mandatory order to ask all of the questions. The order of subjects discussed with the participants varied according to the individual process of every interview. The interview guide was divided into five main parts. Part A was about the reasons of banks for insisting on a guarantee when making loan decisions and the general criteria that might influence the decision about whether to provide a loan or not. Part B was about the information banks receive or require from the firms. Part C dealt with the establishment or intensification of lending relationships. Part D was about the ability of the guarantee bank to mitigate credit restrictions for SMEs. Part E dealt with the impact of the inclusion of the guarantee on the cost side of banks and the default rate related to SMEs that obtained a loan including a guarantee from the guarantee bank. The interview guide was nearly identical for all interviews with only one exception. After the second interview, a question about additional profits (cross-selling) was included in part E. This was something, both interviewees of the first two interviews referred to when talking about the expected profits and was considered to be an important issue. The translated interview guide of this research

project is attached in Appendix VII. Table 3.5 presents the relationships among the research questions, propositions and parts of the interview guideline and highlights main issues asked in every section.

Table 3.5: Research questions, propositions and related interview parts

Research Question	Propositions	Interview Section	Main Issues
For what reasons and in which situations are guarantees from the guarantee bank important for the provision of loans to SMEs?	P1: SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral.	Part A: Rationales for insisting on a guarantee	Reasons for insisting on a guarantee: default rate, collateral, business project, firm characteristics, costs
	P2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan.	Part A: Rationales for insisting on a guarantee	Significance of guarantees
	P2b: Including a guarantee from the guarantee bank makes SME loans more profitable for banks.	Part E: Costs	Impact on costs and profit
Can the provision of a guarantee from a guarantee bank help to reduce information asymmetries between the lending bank and the borrower?	P3a: SMEs provide more information and more regular information to the lending bank as a consequence of obtaining the guarantee from the guarantee bank.	Part B: Information	Amount and regularity of information provided
Has a new lending relationship been created due to the provision of the loan with guarantee?	P3b: Increased information supports the creation of a bank-borrower relationship.	Part C: Lending relationship	Relationship after receiving a guaranteed loan
Do German guarantee banks help to overcome credit restrictions for SMEs?	P4: Guarantee banks help to mitigate credit restrictions for SMEs.	Part D: Credit restrictions	Impact on future credit provision

To save the participant's time and costs, the interviews were conducted in their own offices. This was where they feel the most comfortable and where they may have access to data needed. A central aim within the first few minutes was to establish the researchers credibility and to gain the participant's confidence (Saunders et al., 2009; Bryman and Bell, 2007; Harvey, 2011). Therefore, every interview started with a short explanation of the research aim and an introduction of the interviewer. This was intended to signal the existing knowledge of the researcher and her background. The aim was to ensure the participant that technical terms can be used and will be understood as the researcher herself has worked in a bank for several years. It also illustrates the researcher's awareness of the sensitivity of information given and the

existence of the banking secrecy. It was explicitly emphasized that all information will be treated absolutely confidentially (Saunders et al., 2009; Easterby-Smith et al., 2008; Harvey, 2011). Every interview was audio recorded thanks to the permission of the participants. The permission was always granted when arranging the appointment. Nevertheless, the researcher took individual notes during the interview. These notes were for reminding the researcher to probe questions if necessary after the participant had completed a thought. Moreover, making notes demonstrated the importance of the answers given (Saunders et al., 2009). Respect for the participant's knowledge of the subject matter was also demonstrated by closing every interview with asking the participant whether, in his or her opinion, important aspects had been ignored. This was also aimed to make sure that no important points were missing (Gläser and Laudel, 2009; Harvey, 2011).

Conducting two or more interviews in the same day was avoided. This allowed time to record the responses of the interview immediately and prevented mixing up data. Besides the responses, the role of the participant within his or her bank, the location of the interview, the duration and date of the interview and a short note about how good or bad the interview went were recorded (Bryman, 2006; Saunders et al., 2009).

The first interview was conducted in January 2012 and the last one in April 2012. The final amount of interviews had not been determined in advance. Instead, the decision to finish interviewing was made when the data collected seemed to adequately address all research questions and no further or surprising answers were expected (Pratt, 2009; Liamputtong, 2009).

3.3.2 Data quality in qualitative research

Data quality is an important issue when conducting semi-structured interviews. Data quality in qualitative research should be reliable, valid and generalizable (Saunders et al., 2009).

Reliability

Reliability in semi-structured interviews is concerned with whether two or more interviewers would receive identical answers from one interviewee. Since the particular advantage of semi-structured interviews is the opportunity to react in interviews, the attempt to ensure reliability is not really feasible.

In semi-structured interviews, reliability is always related to issues of bias (Saunders et al., 2009). Measures adopted to reduce reliability and bias to a minimum will be explained in 3.3.5.

Validity

According to Saunders et al (2009), p. 327, in qualitative research, validity

> "(…) refers to the extent to which the researcher gains access to their participants' knowledge and experience, and is able to infer a meaning that the participant intended from the language that was used by this person."

The opportunity to probe questions, discuss and clarify responses in semi-structured interviews leads to a high degree of validity. Therefore, validity of semi-structured interviews is not really an issue when conducted carefully (Saunders et al., 2009).

Generalizability

Considering semi-structured interviews, generalizability is not an issue about whether the people interviewed are representative for a population. Due to normally relatively small numbers of interviews concentrated on one locality or organization, it cannot be aimed to generalize research results on a wider population (Hubermann and Miles, 2002). Therefore, in qualitative research the assessment of generalizability is concerned with whether findings or settings are applicable to existing theories and with understanding meanings and behaviours in the research context (Saunders et al., 2009; Bryman and Bell, 2007; Hubermann and Miles, 2002). Moreover, generalizability in qualitative research is rather concerned with whether the situations studied are adaptable to other settings (Guba and Lincoln, 1982; Goetz and LeCompte, 1984). The literature review has demonstrated that the research objectives and propositions have been derived from existing theories about the influence of Credit Guarantee Schemes on the access to finance for SMEs. These theories have been tested by conducting interviews with bank managers to analyse the motivations and rationales for insisting on a guarantee and to deduce the impact of the guarantee bank in Hesse on bank lending. The interview guide that was used ensured that every interview was conducted in the same structured manner. This allows an application to other settings and populations and enables comparability of results with other studies. Moreover, this research includes detailed description of the interviewees, the settings and the interview guideline. This allows comparison with

other research that used similar approaches (Hubermann and Miles, 2002; Goetz and LeCompte, 1984; Guba and Lincoln, 1982).

3.3.3 Piloting the interviews

The subjects and questions to be covered in the interviews were discussed with two university professors, two bank managers and one member of the Chamber of Trade and Industry. Moreover, test interviews were conducted with another two bank managers which took approximately 70 minutes each. As a result, the importance of making additional business by providing instead of denying, loans to SMEs became clear. Therefore, it was decided to add this topic to the interview guide. Apart from that, no changes were made.

3.3.4 Facts about the interviewees

The interviews were conducted with bank managers who are employed in SME financing and who had already worked with guarantees of the guarantee bank in SME financing. When interviewees were chosen, it was considered to be important to find persons who were skilled and experienced in SME financing. To get access to these persons, the guarantee bank Hesse provided a list containing all banks that have applied for a guarantee from 2003 on (this was the first year the guarantee bank recorded such data) as well as the number of guarantees they have applied for in every year. Ten banks that appeared to be frequently engaged in applying for guarantees were chosen and reported to the guarantee bank. The guarantee bank then provided the names and contact details of their contact persons at these banks. The contact persons were called and appointments were made by the researcher herself. Some other things were considered to be important when choosing the interviewees. One was to find interviewees at all three sorts of banks in Germany: the co-operative banks, the savings banks and the private banks. As the private banks are less engaged in SME financing, two private banks were contacted, whereas four savings banks and four co-operative banks were contacted. Moreover, it was intended to talk to banks located all over the federal state of Hesse.

3.3.5 Interviewer and response bias

There are two types of bias that might occur when conducting semi-structured interviews: interviewer bias and interviewee or response bias. The interviewer him- or herself might create bias when interpreting responses of participants as well as in the way of asking questions. To reduce this type of bias, the interviewer avoided enforcing her own beliefs and thoughts about the research topic when asking questions. Moreover, it was considered to be important to prevent influencing answers by the sound of the voice, comments or non-verbal behaviour. In addition, the demonstration of credibility and gaining the participants' trust was used to avoid interviewer bias (Saunders et al., 2009; Easterby-Smith et al., 2008). As opposed to interviewer bias, response bias is not necessarily related to the interviewer. Participants may 'govern' their responses (Saunders et al., 2009). They might endeavour to throw a positive light on their bank and their business practices and, therefore, depict their decision making process in a more positive way. Due to the banking secrecy, they also might withhold some information considered as being sensitive. To reduce this risk to a minimum, the creation of a relationship of trust between the interviewer and the participants as well as the proof of the interviewer's credibility and the assurance of confidentiality was considered as essential in the present research. Nevertheless, response bias cannot be eliminated with absolute certainty.

3.3.6 Analysis of transcripts

Qualitative research is most often inductive (Bryman and Bell, 2007; Patton, 2001). However, the presented research used well-defined research questions and propositions derived from theory and therefore it follows a deductive approach. This is not a contradiction to qualitative research which can be both inductive or deductive (Saunders et al., 2009; Pratt, 2009; Bitektine, 2008). Where a deductive approach is applied, data collection can be conducted with categories and initial code words derived from the propositions. Therefore, the qualitative data analysis is more structured and formalized and more closely oriented towards testing proposition (Saunders et al., 2009). This is exactly the case in the present research. After every interview was transcribed, the data analysis started by reading every transcript without making any notes. In a second step, every transcript was read over again.

This time, notes were made and sentences of certain importance have been marked. Codes were orientated towards categories according to the topics of the propositions like ‘information’, ‘meaning guarantee’, ‘costs’. The next step was producing separate word documents for every category and copying the highlighted sentences from every interview into these documents. The word documents contained tables which consisted of three columns each. The first column contained the label of the interviewee to demonstrate which interviewee made the comment included. The second column contained the sentences marked in the transcripts. In the third column, a summary of key points was produced to compress long statements in to briefer ones. Sometimes only one or two key words were used to summarize the key message of the statements. The next step was to read over every separate word document very thoroughly to make sure that the sentences copied were consistent. Moreover, the sentences were checked for code words which have been used very often. Analysing the statements about the reasons for insisting on a guarantee from a guarantee bank, for example, reveals that most interviewees referred to risk and the meaning of a viable business project. These code words were highlighted in different colours and played an important role in the final analysis.

All interviews were conducted in German as this is the primary language of all interviewees. The transcription and the analysis of the data was conducted in German to avoid the time consuming translation in English as well as to avoid distortions of the data (Bryman and Bell, 2007). For writing up the research those sentences that were directly cited were translated into English language.

4 Survey results

This chapter analyses the results of the web survey carried out in summer 2011 with SMEs that received a guarantee from guarantee bank Hesse. Section 4.1 starts with univariate analyses presenting frequency distributions of those demographic variables that are important for further analyses in the following sections. This gives a first impression about the distribution of these variables. In the subsequent sections propositions will be examined. Section 4.2 is about statistical analyses of the access to bank loans of the respondent firms. Section 4.3 examines the meaning of guarantees from the guarantee bank for SMEs. Whether SMEs that obtained a guarantee from the guarantee bank provide more and more regular information to their banks will be analysed in Section 4.4. Section 4.5 is about the creation or intensification of bank-borrower relationships. Section 4.6 analyses whether credit restrictions can be mitigated due to guarantees from the guarantee bank. Section 4.7 contains the results of the hierarchical cluster analysis. The clustering is based on the variables about the bank-borrower relationship at the time the loans with guarantees from the guarantee bank were provided. This section also contains the analyses of the existing relationships between the clusters and other variables.

4.1 Main demographic characteristics of the sample

This section includes frequency tables with demographic variables of particular importance for the research to provide an impression about the structure of the sample. Figure 4.1 presents the distribution of the legal forms. The figure demonstrates that most SMEs of the sample are either sole proprietors or private limited companies.

Figure 4.1: Frequency distribution of legal forms (PVI, Q1)

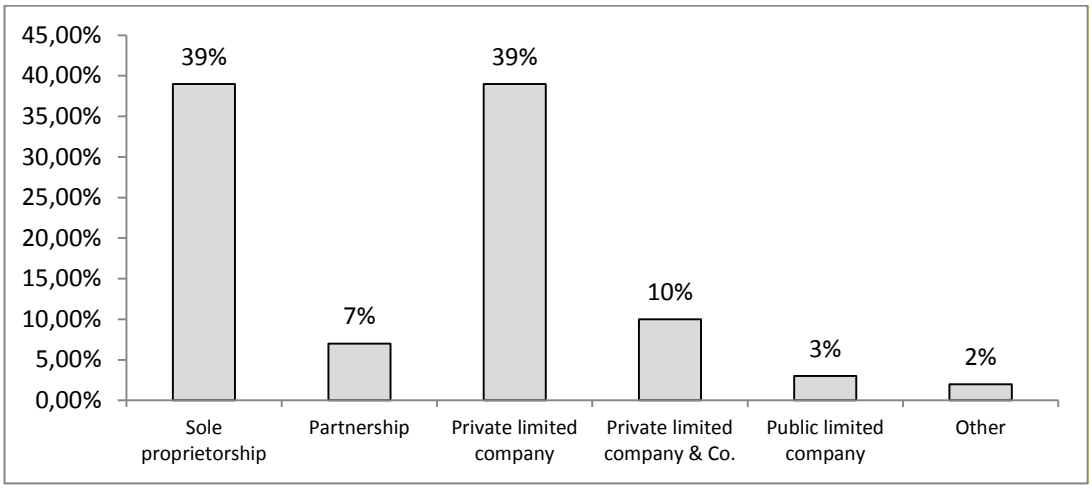


Figure 4.2 presents the distribution of the age of the firms. Since firms that answered the web survey in spring 2011 received the guarantee between 2003 and 2008 it is not surprising that the sample contains only a small number of firms between 1 and 3 years old. To receive a guarantee in 2008 at the latest, respondent firms must have had been established before December 2008. The highest share of all respondents within the sample was more than nine years old.

Figure 4.2: Frequency distribution of age of the firms (PVI, Q2)

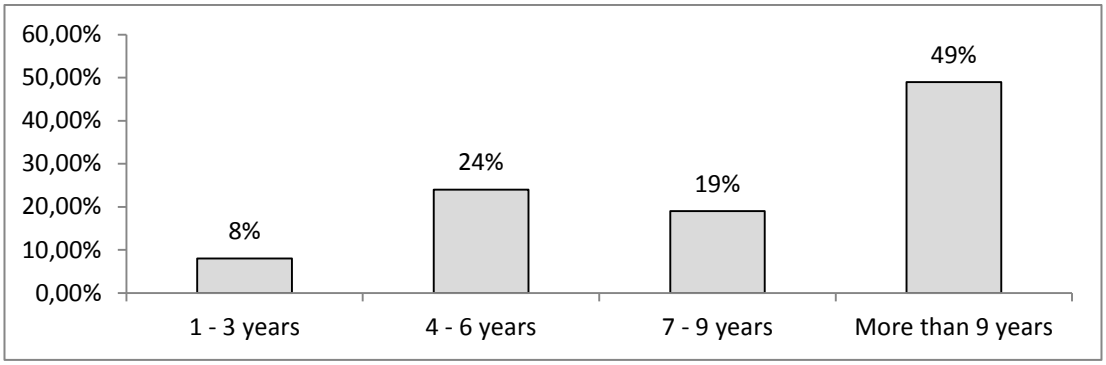
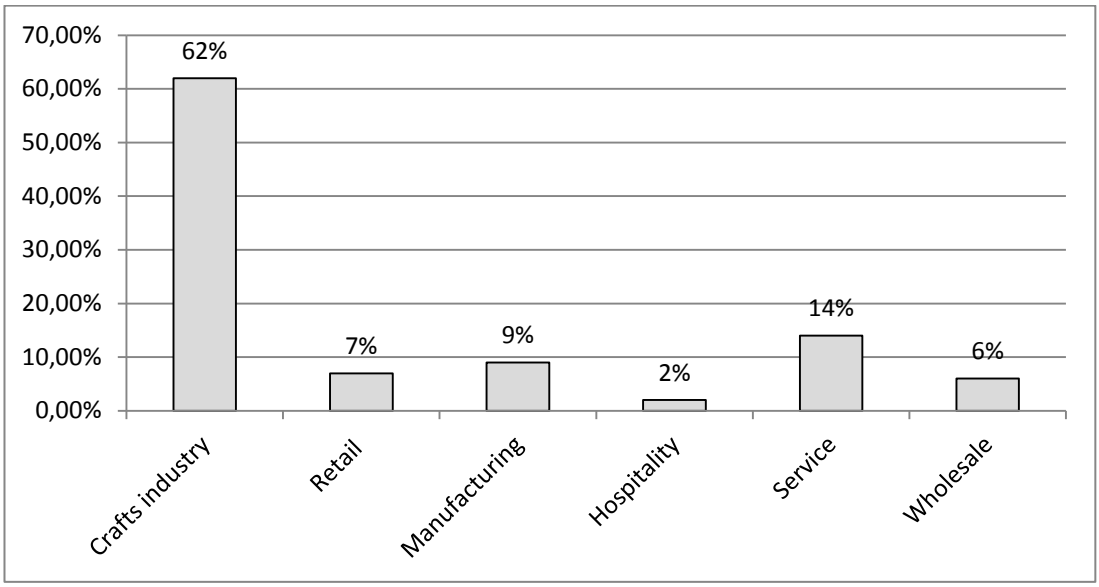


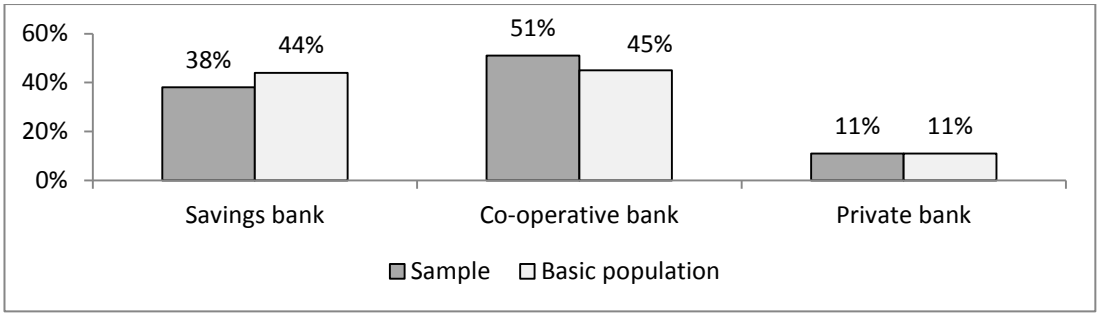
Figure 4.3 contains the distribution of the industrial sectors. The categories have been oriented towards the industrial sectors commonly used by guarantee banks which, for example, do not contain the communications or logistics sector (Association of German Guarantee Banks, 2012). The categories highlighted in Figure 4.3 below demonstrate that the classification is more clustered than the classification used by the Institute of SME Research, the Reconstruction Loan Corporation or the Federal Statistical Office (NACE code), for example. Therefore, a comparison between the sample and the wider population of SMEs in Germany was not possible.

Figure 4.3: Frequency distribution of industrial sectors (PVU, Q3)



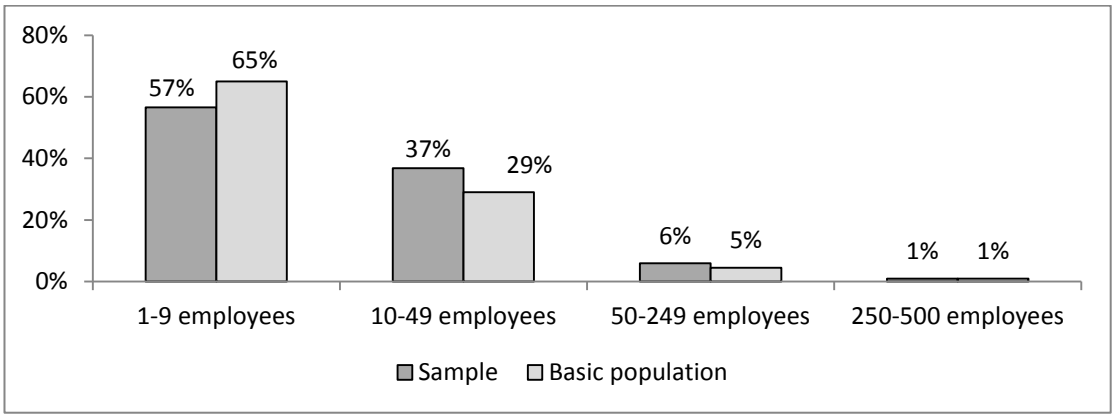
To examine the representative status of the sample, it has to be compared to the basic population of the guarantee bank Hesse. Comparable data about the basic population was only available for two variables: the number of employees of the SMEs and the type of bank the firms received the loans from. Information about the type of bank was calculated from the annual reports of the guarantee bank Hesse. Since the web survey was sent out to SMEs that received a guarantee between 2003 and 2008, the annual reports of these years were analyzed to compute the basic population. Figure 4.4 illustrates the frequency distribution of the type of bank within the sample and the basic population.

Figure 4.4: Frequency distribution of type of bank (PIII, Q5)



Additionally, the guarantee bank Hesse provided information about the number of employees of the supported firms between 2003 and 2008 to the researcher. Figure 4.5 contains the frequency distribution of the number of employees within the sample as well as the basic population.

Figure 4.5: Frequency distribution of number of employees (PVI, Q5)



Since headcount is one important criteria that defines SMEs (European Commission, 2006; Institute for SME Research, 2012), this was used to analyze the representativeness of the sample. To test whether the distributions of the sample are significantly different from those of the basic population, chi-square tests were used for the two variables that allowed a comparison. Table 4.1 demonstrates that no significant difference is perceivable. Regarding the frequency distributions, it cannot be rejected that the sample and the basic population underlie the same distribution. Consequently, no evidence against representativeness could be found.

Table 4.1: Tests for representativeness of the sample

	Sample		Basic population		Total	
Savings bank	57	37.7%	419	44.0%	476	43.2%
Co-operative bank	77	51.0%	428	45.0%	505	45.8%
Private bank	17	11.3%	105	11.0%	122	11.1%
Total	151	100.0%	952	100.0%	1,103	100.0%
$\chi^2 = 2.228$; df = 2; p = 0.328; Sig. ≥ 0.01						

	Sample		Basic population		Total	
1-9 employees	86	56.6%	618	64.9%	704	63.8%
10-49 employees	56	36.8%	276	29.0%	332	30.1%
50-249 employees	9	5.9%	48	5.0%	57	5.2%
≥ 250 employees	1	0.7%	10	1.1%	11	1.0%
Total	152	100.0%	952	100.0%	1,104	100.0%
$\chi^2 = 4.514$; df = 3; p = 0.211; Sig. ≥ 0.01						

Appendix VIII contains frequency distributions of all other questions which are not discussed in this or the following sections. It presents, for example, the frequency distribution of the answers about the respondent's position within the SMEs. The

question was asked to ensure that respondents were adequately qualified to answer the survey. Additionally, it contains questions about the guarantee bank. However, these questions did not contribute to the evaluation of the expected learning effect between the lending banks and the borrowers and were not further analyzed.

4.2 Access to bank loans

The first question within the web survey (Part I) asked how severe the difficulties were in obtaining bank loans (from 1 = not severe to 5 = severe). Analysing the answers to this question allowed an estimation of credit restrictions for SMEs (proposition 1). In a first step, univariate descriptive analyses were conducted. Table 4.2 shows the frequency distribution of the answers given.

Table 4.2: Frequency distribution of problems in obtaining bank finance

Value label	Value	Frequency	Percentage	Valid percentage	Cumulative percentage
Not severe	1	2	1.3	1.3	1.3
	2	16	10.2	10.2	11.5
	3	45	28.7	28.7	40.2
	4	57	36.3	36.3	76.5
Severe	5	36	22.9	22.9	99.4
Missing	0	1	0.6	0.6	100.0
	Total	157	100.0	100.0	

The table above demonstrates that the majority of all respondents confirmed difficulties in obtaining bank loans for SMEs. This is also confirmed by a mean value of 3.68 and a standard deviation of 1.020.

It has already been illustrated that some firm characteristics are widely associated with higher difficulties in receiving bank loans than other. To test whether this also applies for those SMEs that answered the survey, bivariate analyses were conducted. Based on existing literature, higher difficulties were expected for those SMEs that were associated with a higher risk by the lending banks. These are especially younger and smaller firms (Creditreform, 2013; Schwarz and Zimmermann, 2012; Beck et al. 2010; Reize 2011), firms of industrial sectors that have higher default risks (Creditreform, 2010) and firms in a legal form with limited liability (Reize, 2011). Therefore, the relationship between the access to bank finance and the age of

the firm, the industrial sector, the size of the firm and the legal form where analysed by using cross tabulation and chi-square tests. To find out whether difficulties are related to the type of bank the SME applied for a loan, the relationship between the access to bank loans and the type of bank was tested.

Relation between access to bank loans and number of employees

Higher difficulties in obtaining bank loans are expected for the smallest SMEs (Reize, 2011; Schwarz and Zimmermann, 2012). In the web survey, size of the firms was measured by headcount. Table 4.3 highlights the results of the cross tabulation and the chi-square test. To distinguish between the smallest firms and bigger firms within the sample, two categories were created. The first category contains firms with up to 9 employees; the second category is firms with more than 9 employees. The answers about access to bank loans are divided in three categories: those that indicated no severe difficulties (values 1 + 2), those that decided for the neutral position (value 3) and those that indicated severe problems (values 4 + 5). The categorization was intended to improve results of the contingency tables. Without the categorization, the contingency table contained an expected count of less than 5 for more than 20 per cent of all cells.

Table 4.3: Access to bank finance (PI, Q1) vs. number of employees (PIV, Q5)

	Number of employees					
	≤ 9 employees		> 9 employees		Total	
Difficulties in obtaining bank finance						
Not severe	11	12.8%	7	10.6%	18	11.9%
Neutral	25	29.1%	19	28.8%	44	28.9%
Severe	50	58.1%	40	60.6%	90	59.2%
Total	86	100%	66	100%	152	100%
χ^2=0.190; df=2; p=0.909; Sig. ≥0.1						

Other than expected, the results convey that the smallest firms did not indicate more severe problems in obtaining bank loans than older firms. All firms affirmed the existence of financing problems for SMEs. Consequently, the assumed relationship cannot be confirmed.

Relation between access to bank loans and legal form

One could assume that SMEs with a legal form that limits the liability of the owners have more problems in obtaining bank loans than firms with a legal form of

unlimited liability since these firms can unload a part of their default risk upon the lender in the case of an insolvency (Reize, 2011). To test this, the responses to the question about the legal form were categorized. One category contained the legal forms with unlimited liability (sole proprietorship and partnership), and the other category contained legal forms with limited liability (limited company, GmbH limited company & Co., stock company). Table 4.4 shows the results of the statistical tests:

Table 4.4: Access to bank finance (PI, Q1) vs. legal form (PIV, Q1)

	Legal form					
	Unlimited		Limited		Total	
Difficulties in obtaining bank finance						
Not severe	10	14.3%	8	10.0%	18	12.0%
Neutral	21	30.0%	23	28.7%	44	29.3%
Severe	39	55.7%	49	61.3%	88	58.7%
Total	70	100.0%	80	100.0%	150	100.0%
χ^2=0.786; df=2; p=0.675; Sig. ≥0.1						

The table demonstrates that no difference is perceivable between legal forms with unlimited liability and those with limited liability.

Relation between access to bank loans and industrial sector

Industrial sectors are associated with different default risks (Creditreform, 2010). SMEs that are acting within an industrial sector that is connected to a relatively high default risk might have more severe difficulties in receiving bank loans than others (Reize, 2011). To test this, industrial sectors with bad solvency, according to Creditreform 2010, have been identified. The so-called Bonitätsindex (solvency index) of Creditreform is presented in Table 4.5:

Table 4.5: Creditreform solvency index 2010

Industrial sector	**Solvency index 06/2010**
Hospitality industry	276
Building industry	257
Consumption services	257
Automobile trade	256
Traffic/logistic	252
Enterprise services	251
Retail industry	251
Overall economy	250

Table 4.5 (continued)

Industrial sector	Solvency index 06/2010
Agriculture	249
Information and communication	249
Consumer goods	245
Provider and disposer	239
Metal processing	239
Mining	239
Wholesale trade	238
Engineering	236
Electrical industry	234
Financial services	229

(Source: Creditreform 2010a, p. 15)

The definitions of the industrial sectors used in the web survey are oriented toward those used by the guarantee banks (Association of German Guarantee Banks 2012). Therefore, the definitions do not correspond to those of Creditreform, and the index could not be reproduced exactly. Industrial sectors that were contained in both sources are the hospitality industry, the retail industry and the service industry (even though this sector was divided into two parts in the solvency index of Creditreform, both sectors are worse than the overall economy and can be merged). The crafts industry is not represented in the solvency index. However, regarding all sectors presented in the index, it fits mostly to the building industry. In the solvency index, the building industry is worse than the overall economy. For allowing better distinction between those industrial sectors that are related to a solvency better than the overall economy and those related to a worse solvency, two separate groups have been created. Firms of the industrial sectors industry and wholesale were merged to the group 'better solvency' and firms of the crafts industry, retail, hospitality and service were merged to the group 'worse solvency'. The results of the chi-square test and the contingency table for these two groups are presented in Table 4.6.

Table 4.6: Access to bank finance (PI,Q1) vs. industrial sector (PIV,Q3)

	Industrial sector					
	Worse solvency		Better solvency		Total	
Difficulties in obtaining bank finance						
Not severe	14	10.4%	4	18.2%	18	11.5%
Neutral	41	30.6%	4	18.2%	45	28.8%
Severe	79	59.0%	14	63.6%	93	59.6%
Total	134	100.0%	22	100.0%	156	100.0%
χ^2=2.059; df=2; p=0.357; Sig. ≥0.1						

The findings demonstrate that no significant statistical relationship between the two variables was found. It becomes visible that also firms of industrial sectors which are better than the overall economy reported difficulties in obtaining bank loans.

Relation between access to bank loans and age

Another relationship can be expected between the age of the firm and its access to bank loans. It is assumed that younger firms or start-ups have more severe difficulties in receiving bank loans than older firms (Columba et al. 2010; Beck et al. 2010; Berger and Udell, 1998). The results of the analysis are presented in Table 4.7 below.

Table 4.7: Access to bank finance (PI, Q1) vs. age of the firms (PIV, Q2)

	Age of the firm							
	1-3 years		4-9 years		>9 years		Total	
Difficulties in obtaining bank finance								
Not severe	2	16.7%	3	4.5%	13	17.1%	18	11.7%
Neutral	4	33.3%	26	39.4%	14	18.4%	44	28.6%
Severe	6	50.0%	37	56.1%	49	64.5%	92	59.7%
Total	12	100.0%	66	100.0%	76	100.0%	154	100.0%
χ^2=11.210; df=4; p=0.024; Sig. <0.05								

For a descriptive analysis, the results confirm a relationship between the two variables. Younger firms less often stated having more severe difficulties in obtaining bank loans for SMEs than expected whereas older firms more frequently indicated severe problems. This is not in line with the expected outcome. However, due to the fact that 22.2 per cent of the cells had an expected count of less than 5, reliable statistical results cannot be generated.

Relation between access to bank loans and type of bank

SME loans in Germany are primarily provided by either savings banks or co-operative banks. This is due to the central aim of these two banks to support German SMEs. Private banks are more reluctant in providing SME loans. To demonstrate this, cross tabulation and chi-square test for the relationship between bank sector and the number of employees, legal form, industrial sector and age of the firm have been conducted. The results are presented in Table 4.8 below.

Table 4.8: Demographic variables (PIV, Q1,2,3,5) vs. bank sector (PIII, Q5)

	Bank type					
	Savings bank or co-operative bank		Private bank		Total	
Number of employees						
≤ 9 employees	78	59.1%	7	41.2%	85	57.0%
10-49 employees	50	37.9%	5	29.4%	55	36.9%
> 49 employees	4	3.0%	5	29.4%	9	6.0%
Total	132	100.0%	17	100.0%	149	100.0%
χ^2=18.493; df=2; p=0.000; Sig. <0.01						
Legal form						
Unlimited liability	66	50.8%	3	17.6%	69	46.9%
Limited liablilty	64	49.2%	14	82.4%	78	53.1%
Total	130	100.0%	17	100.0%	147	100.0%
χ^2=6.622; df=1; p=0.015; Sig. <0.05						
Industrial sector						
Worse solvency	118	86.1%	13	76.5%	131	85.1%
Better solvency	19	13.7%	4	23.5%	23	14.9%
Total	137	100.0%	17	100.0%	154	100.0%
χ^2=1.111; df=1; p=0.292; Sig. ≥0.1						
Firm age						
1-3 years	9	6.7%	2	11.8%	11	7.3%
4-9 years	58	43.3%	8	47.1%	66	43.7%
>9 years	67	50.0%	7	41.2%	74	49.0%
Total	134	100.0%	17	100.0%	151	100.0%
χ^2=0.817; df=1; p=0.664; Sig. ≥0.1						

The results demonstrate that private banks provide a smaller number of loans to SMEs. No relationship between the bank and the industrial sector or the age of the firms is perceivable. Regarding the size of the firms, the results illustrate that private banks provide more loans to bigger firms which are related to a lower probability of default. Savings banks and co-operatives provided more loans to smaller firms which are related to a higher probability of default (Beck et al. 2010; Cressy, 2006; Leeth and Scott, 1989). The relationship between the bank and the size of a firm is statistically significant (Sig. <0.01). To evaluate the strength of the association, Cramer´s V was calculated (McHugh, 2013; Bühl, 2008; Brosius, 2006). The value of 0.352 demonstrates that the association is not strong. The results illustrated in table 4.8 also demonstrate a statistically significant relationship between the bank

and the legal form (Sig. <0.05). It is perceivable that private banks provide loans more often to firms with a legal form of limited liability. To measure the association of the 2x2 table, Phi was calculated (Malhotra, 2010; Bühl, 2008; Brosius, 2006). The value of 0.212 shows a low association.

To find out whether difficulties in obtaining bank loans are dependent on the bank of a firm, cross tabulation and chi-square test were also run for these two variables. The results are illustrated in Table 4.9 below.

Table 4.9: Access to bank finance (PI, Q1) vs. bank (PIII, Q5)

	Bank							
	Savings bank		Co-operative		Private bank		Total	
Difficulties in obtaining bank finance								
Not severe	9	15.3%	9	11.7%	0	0.0%	18	11.8%
Neutral	16	27.1%	21	26.3%	6	35.3%	43	28.1%
Severe	34	57.6%	47	61.0%	11	64.7%	92	60.1%
Total	59	100.0%	77	100.0%	17	100.0%	153	100.0%
χ^2=3.094; df=4; p=0.542; Sig. ≥0.1								

According to the results, no difference between the banks is perceivable. SMEs have to face the same difficulties in obtaining bank loans from private banks as SMEs face from savings banks or co-operatives. However, the results do not meet the requirements for a chi-square test since 22.2 per cent of the cells have a count of less than 5.

Interim conclusion about access to bank loans

The previous sections have demonstrated that SMEs indeed have to face difficulties in obtaining bank loans. However, the expected relations have not been confirmed statistically. The findings indicate that difficulties exist independently of the legal form, the industrial sector, the number of employees or the type of bank a firm applies for a loan. These findings are widely in line with an analysis undertaken by the Reconstruction Loan Corporation in 2011. It empirically tested loan denials for SMEs and found that the legal form and the industrial sector play a minor part in credit refusals. However, they also found that very small SMEs with not more than five employees have to face higher difficulties in obtaining bank loans (Reize, 2011). The classifications of the single categories are not that acute in the presented

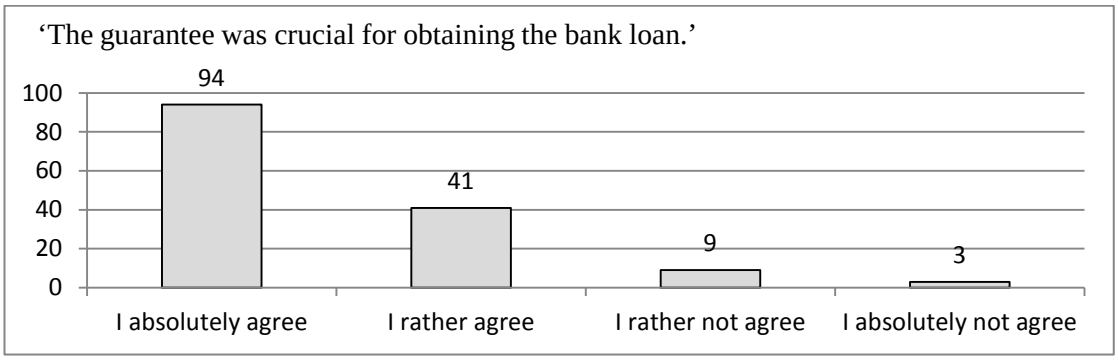
research. The smallest group consists of one to nine employees. That might be one reason for the slightly different results. Another reason might be that the research presented here was addressed solely to SMEs that received a guarantee of a guarantee bank. Those SMEs are more involved in difficulties in obtaining bank loans. Most of them would not even have received a loan without the guarantee which will be demonstrated later.

The results also demonstrated that co-operative banks and savings banks are more important for SME financing since these banks provide more loans to the respondent firms. Moreover, savings banks and co-operative banks provided more loans to smaller and younger firms and firms with unlimited liability.

4.3 Significance of guarantees for the access to bank finance

To assess whether guarantees from the guarantee bank help to mitigate problems in obtaining bank loans of SMEs (proposition 2a), respondents of the web survey were asked to give a statement about the significance of the guarantee for receiving the bank loan (part II, question 3e). Firms had to state whether they 'absolutely agree' (value 1), 'rather agree' (value 2), 'rather not agree' (value 3) or 'absolutely not agree' (value 4) to the statement that the guarantee was crucial for obtaining the loan. As visible in Figure 4.6, the vast majority of all SMEs absolutely or rather agree to the statement that the guarantee was crucial to obtain the loan.

Figure 4.6: Frequency distribution of significance



The high importance of guarantees also becomes visible by the mean value of 1.46 and the standard deviation of 0.705.

It can be expected that the significance of a guarantee is higher for those SMEs that have to face more difficulties in obtaining bank loans. To test this, contingency tables

and chi-square tests have been computed. The appropriate use of the chi-square test requires that no more than 20 per cent of the cells show an expected frequency of less than 5 (Bühl 2008; Brosius 2006). To better meet this prerequisite, the answers about the significance of the guarantee have been categorized. The category 'guarantee was crucial' contains respondents that absolutely agreed and agreed to the statement that the guarantee was crucial for obtaining the loan. Respondents that rather not or absolutely not agreed are pooled in the category 'guarantee was not crucial'.

Relation between significance of guarantee and number of employees

In a first step, the relationship between the significance of a guarantee for obtaining bank loans and the number of employees of the firms are illustrated. It is distinguished between firms with up to nine employees and those with more than nine employees. The classification is related to existing data showing that smaller firms have more severe difficulties in obtaining bank loans due to higher insolvency risk (Creditreform, 2012) or smaller equity ratios (Creditreform, 2013; Zimmermann, 2009). The results of cross tabulation and chi-square test are demonstrated in Table 4.10 below.

Table 4.10: Significance guarantee (PII, Q3e) vs. number employees (PIV, Q5)

	Employees					
	≤ 9 employees		> 9 employees		Total	
Significance guarantee						
Guarantee was crucial	81	96.4%	52	85.2%	133	91.7%
Guarantee was not crucial	3	3.6%	9	14.8%	12	8.3%
Total	84	100.0%	61	100.0%	145	100.0%
χ^2=5.822; df=1; p=0.016; Sig. <0.05						

The results confirm a relationship between the significance of a guarantee for obtaining a bank loan and the number of employees of a SME. Smaller firms more often indicated a high significance of the guarantee than bigger firms. The relationship is statistically significant (p=0.016). To evaluate the strength of the association between the number of employees and the significance of a guarantee (two dichotomous variables; 2x2 table), Phi was computed (Malhotra 2010; Saunders et al. 2009; Bühl 2008). The Phi-value of 0.200 (Sig. 0.016) illustrates that the association is not very strong.

Relation between significance of guarantee and legal form

To find out whether a relationship between the legal form of a firm and the significance of a guarantee exists, the legal forms were divided into two groups: those with unlimited liability and those with limited liability. Table 4.11 shows that the expected relationship cannot be confirmed.

Table 4.11: Significance of guarantee (PII, Q3e) vs. legal form (PIV, Q1)

	Legal form					
	Unlimited		Limited		Total	
Significance guarantee						
Guarantee was crucial	64	92.8%	67	90.5%	131	91.6%
Guarantee was not crucial	5	7.2%	7	9.5%	12	8.3%
Total	69	100.0%	74	100.0%	143	100.0%
χ^2=0.227; df=1; p=0.633; Sig. ≥0.1						

Relation between significance of guarantee and industrial sector

It can be assumed that the significance of guarantees from guarantee banks is higher for SMEs from industrial sectors which are related to high risk. The assumption is that SMEs from industrial sectors with a higher risk have more problems to obtain a loan (Creditreform 2010). Therefore, the guarantee is more important to obtain a loan. To test whether a relationship between the industrial sector and the assessment of the significance of a guarantee exists, contingency table and chi-square test were conducted. The results are demonstrated in Table 4.12 below. According to the Creditreform Solvency Index 2010 the following distinction was applied: firms of the industrial sectors wholesale and industry were merged to the group 'better solvency' and firms of the crafts industry, retail, hospitality and service were merged to the group 'worse solvency' (compared to the overall economy).

Table 4.12: Significance guarantee (PII, Q3e) vs. sector groups (PIV, Q3)

	Industrial sector					
	Worse solvency		Better solvency		Total	
Significance guarantee						
Guarantee was crucial	114	90.5%	21	100.0%	135	91.8%
Guarantee was not crucial	12	9.5%	0	0.0%	12	8.2%
Total	126	100.0%	21	100.0%	147	100.0%
χ^2=0.227; df=1; p=0.140; Sig. ≥0.1						

Within the contingency table, 25.0 per cent of the cells have an expected count of less than 5. Therefore, Fisher's exact test was used. However, the value of 0.216 (2-sided) and the value of 0.145 (1-sided) do not indicate a significant relationship.

Relation between significance of guarantee and age of the firm

As it was supposed that younger firms have more difficulties in obtaining bank loans (Columba et al. 2010; Reize, 2005; Berger and Udell, 1998), it can also be expected that for those firms, guarantees from guarantee banks are more important. Table 4.13 below demonstrates that the expected relationship between the two variables cannot be confirmed. Guarantees from guarantee banks had the same high significance within all groups of firms.

Table 4.13: Significance of guarantee (PII, Q3e) vs. age of the firms (PIV, Q2)

	Age of the firm							
	1-3 years		4-9 years		>9 years		Total	
Significance guarantee								
Guarantee was crucial	11	91.7%	60	92.3%	64	91.4%	135	91.8%
Guarantee was not crucial	1	8.3%	5	7.7%	6	8.6%	12	8.2%
Total	12	100.0%	65	100.0%	70	100.0%	147	100.0%
χ^2=0.035; df=2; p=0.983; Sig. ≥0.1								

Relation between significance of guarantee and types of bank

To evaluate whether the importance of a guarantee from a guarantee bank depends on the type of bank a firm applies for a loan, contingency table and chi-square test were computed with these two variables. The results are highlighted in Table 4.14.

Table 4.14: Significance guarantee (PII, Q3e) vs. type of bank (PIII, Q5)

	Bank							
	Savings bank		Co-operative		Private bank		Total	
Significance guarantee								
Guarantee was crucial	53	94.6%	67	91.8%	13	86.7%	133	92.4%
Guarantee was not crucial	3	5.4%	6	8.2%	2	13.3%	11	7.6%
Total	56	100.0%	73	100.0%	15	100.0%	144	100.0%
χ^2=1.137; df=2; p=0.566; Sig. ≥0.1								

Within the contingency table, two cells (33.3%) have an expected count of less than 5, and further categorization is not possible. However, the p-value of 0.566 demonstrates that no statistical significance is perceivable. Regarding the percentage

distribution within the cells, it can be stated that even from a descriptive standpoint a relationship between the significance of a guarantee and the type of bank is not perceivable.

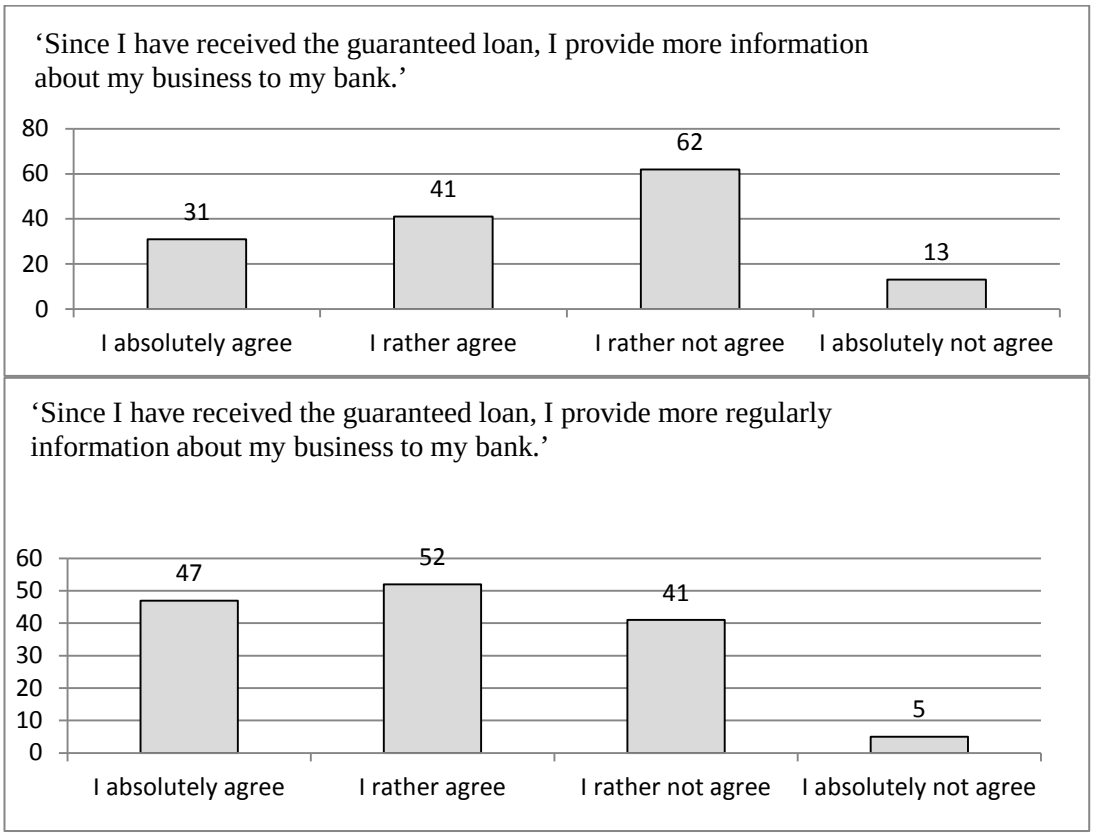
Interim conclusions about the significance of guarantees

The previous sections have demonstrated that guarantees from the guarantee bank are widely considered to be crucial for obtaining bank loans. However, expected relationships between the significance of a guarantee from the guarantee bank and the examined demographic variables were not confirmed statistically. The only exception was that smaller firms indicated a higher importance of guarantees than bigger firms did. Regarding the other demographic variables, the results lead to the interim conclusion that guarantees were important for all respondents independent of the age, legal form, industrial sector or lending bank.

4.4 Provision of information

One aim of the research was to find out whether SMEs that obtained a loan including a guarantee from the guarantee bank Hesse provide more information or more regular information to their bank (see proposition 3a). To test this, SMEs were asked to judge two statements. The first statement was: ‘Since I have received the guaranteed loan, I provide more information about my business to my bank’ (PII, Q 3c) and the second was: ‘Since I have received the guaranteed loan, I provide more regular information about my business to my bank’ (PII,Q 3d). Respondents had to state whether they ‘absolutely agree’ (value 1), ‘rather agree’ (value 2), ‘rather not agree’ (value 3) or ‘absolutely not agree’ (value 4) to the statements. Following the framework which was derived from the literature review (see Section 2.4), it was expected that SMEs provided more information as well as more regular information after they received the loan including the guarantee. This might reduce information asymmetries which are considered to be one reason for credit restrictions (Stiglitz and Weiss, 1981). Moreover, it was expected that SMEs that provided information more regularly also provided more information. The frequency distributions of the answers to the two questions are demonstrated in Figure 4.7 below.

Figure 4.7: Frequency distribution of information provided



The figure illustrates that the ratio between those firms that absolutely or rather agreed to the first statement (amount of information provided) and those that did not agree is nearly equal. Regarding the second statement (regularity of information provided), approximately two-thirds of all respondents agreed and one-third disagreed.

The answers to the two statements define the information behaviour in this research. This was determined by the judgement of the firms about whether they provided more information or/and more regular information to their bank since they received the loan including the guarantee from the guarantee bank. Additional univariate analyses were undertaken to further investigate the information behaviour of the respondent firms. Comparing the means, it becomes visible that the two values differ. The mean value of the statement about the amount of information provided is 2.388 (standard deviation 0.917). This is slightly higher than the mean value of the statement about the regularity of the provision of information which is 2.027 (standard deviation 0.866). The difference of the two values and, therefore, between the answers about the amount and the interval of information provided was also confirmed by running a paired t-test. The results are highlighted in Table 4.15.

Table 4.15: T-test of answers about amount and interval of information

Mean	0.333
Standard deviation	0.757
Standard error	0.063
T	5.282
df	143
Sig.	0.000

The difference between the mean value generated from the t-test (0.333) and the mean value, which would have been expected regarding the means of the two variables (0.361), is explainable by missing values. While the mean value for the variable about the amount of information provided was calculated for N=147 (out of an overall sample of N=157), the mean value for the variable about the regularity of information provided was calculated for N=145. The t-test was calculated for N=144. For the 144 respondents that answered to both questions, the mean values are slightly different (amount of information provided: 2.368; regularity of information provided: 2.035). This results in the above highlighted mean value of 0.333.

To analyse the relationship between the two variables about the provision of information, a chi-square test is run. To ensure consistency with the statistical tests of this section, the answers about the provision of information are categorized for this test. The explanation for the categorization is provided below.

Table 4.16: Amount information (PII, Q3c) vs. interval information (PII, Q3d)

	Interval information					
	More regularly		Not more regularly		Total	
Amount information						
More information	69	70.4%	2	4.3%	71	49.3%
Not more information	29	29.6%	44	95.7%	73	50.7%
Total	98	100.0%	46	100.0%	144	100.0%
χ^2=54.657; df=1; p=0.0000; Sig. <0.01						

The results are statistically significant and confirm a relationship between the amount of information provided and the interval of information provided. The strong association between the two variables is confirmed by the Phi-value of 0.616 (Bühl, 2008).

It was already discussed that SMEs often have to face credit restrictions because of asymmetric information (Berger and Udell, 1998; Ortiz-Molina and Penas, 2008). Within the following sections it is tested whether information asymmetries can be reduced as a result of the provision of a guarantee from the guarantee bank. This is considered as being important especially for those firms that are related to a higher probability of default. Therefore, the relationships between the answers of the two statements concerning the information behaviour and demographic variables that are related to problems in obtaining bank loans were calculated. To ensure that the data better meets the requirements of the chi-square test (less than 20 per cent of the cells within a contingency table shall have an expected count of less than 5), answers about the information behaviour were categorized. SMEs that absolutely agreed or agreed to have provided more information since the loan including a guarantee was obtained were merged in the category 'more information'. Firms that rather not agreed or absolutely not agreed to the statement are grouped in the category 'not more information'. The category 'more regularly' includes firms that absolutely agreed or agreed to have provided information more regularly. The category 'not more regularly' contains firms that rather not agreed or not agreed to the statement.

Relation between information and number of employees

Table 4.17 presents the results about the tests for a relationship between the number of employees of a firm and the information behaviour.

Table 4.17: Information (PII, Q3c,d) vs. number of employees (PIV, Q5)

	Employees					
	≤ 9 employees		> 9 employees		Total	
Amount information						
More information	46	55.4%	24	39.3%	70	48.6%
Not more information	37	44.6%	37	60.7%	74	51.4%
Total	83	100.0%	61	100.0%	144	100.0%
χ^2=3.638; df=1; p=0.056; Sig. <0.1						
Interval information						
More regularly	63	75.9%	34	57.6%	97	68.3%
Not more regularly	20	24.1%	25	42.4%	45	31.7%
Total	83	100.0%	59	100.0%	142	100.0%
χ^2=5.321; df=1; p=0.021; Sig. <0.05						

The results indicate that smaller firms provided more information since they received the loan including the guarantee. To further analyse the statistically significant relationship, Phi was computed (Malhotra, 2010; Bühl, 2008; Brosius, 2006). The value of 0.159 indicates a small association between the two variables.

Considering the regularity, a relationship statistically cannot be rejected. Smaller firms provided information more regularly. The calculated Phi-value of 0.194 indicates a small association between the two variables.

Summing up the results, it can be said that smaller firms provide more and more regular information to their bank. It may be assumed that these firms are related to higher information asymmetries (Berger and Udell, 1998; Ortiz-Molina and Penas, 2008). Therefore, the provision of a guarantee might contribute to a reduction of asymmetric information.

Relation between information and legal form

It was tested whether firms with limited liability had to provide more or more regular information after receiving a guarantee from the guarantee bank. The results are presented in Table 4.18 below.

Table 4.18: Information (PII, Q3c,d) vs. legal form (PIV, Q1)

	Legal form					
	Unlimited		Limited		Total	
Amount information						
More information	33	48.5%	38	51.4%	71	50.0%
Not more information	35	51.5%	36	48.6%	71	50.0%
Total	68	100.0%	74	100.0%	142	100.0%
χ^2=0.113; df=1; p=0.737; Sig. ≥0.1						
Interval information						
More regularly	52	78.8%	45	60.8%	97	69.3%
Not more regularly	14	21.2%	29	39.2%	43	30.7%
Total	66	100.0%	74	100.0%	140	100.0%
χ^2=05.298; df=1; p=0.021; Sig. <0.05						

The results demonstrate that no relationship between the amount of information provided and the legal form exists. Regarding the results about the regularity of information provided, SMEs with unlimited liability more often agreed to have provided information more regularly. For these firms, information asymmetries

might be reduced. The results are statistically significant. The association between the two variables is low (0.195).

Relation between information and industrial sector

To test whether SMEs of industrial sectors which are related to a higher probability of default provide more information or more regular information, contingency tables and chi-square tests were conducted. The results are illustrated in Table 4.19.

Table 4.19: Information (PII, Q3c,d) vs. industrial sector (PIV, Q3)

	Industrial sector					
	Worse solvency		Better solvency		Total	
Amount information						
More information	60	47.6%	12	57.1%	72	49.0%
Not more information	66	52.4%	9	42.9%	75	51.0%
Total	126	100.0%	21	100.0%	147	100.0%
χ^2=0.653; df=1; p=0.419; Sig. ≥0.1						
Interval information						
More regularly	86	69.4%	13	61.9%	99	68.3%
Not more regularly	38	30.6%	8	38.1%	46	31.7%
Total	124	100.0%	21	100.0%	145	100.0%
χ^2=0.460; df=1; p=0.498; Sig. ≥0.1						

The table demonstrates that no statistically significant relationship has been found. SMEs that were engaged in industrial sectors related to a higher probability of default did not provide more information nor did they provide information more regularely after having received a guarantee from a guarantee bank.

Relation between information and age of the firm

Young SMEs often have more problems with providing sufficient information due to their short business history (Zimmermann, 2007; Craig et al., 2008; Columba et al., 2010). This section is about testing whether these SMEs provided more information and more regular information since they received the loan with guarantee. Table 4.20 presents the results of the contingency tables and chi-square test.

Table 4.20: Information (PII, Q3c,d) vs. age of the firms (PIV, Q2)

	Age of the firm							
	1-3 years		4-9 years		>9 years		Total	
Amount information								
More information	5	45.5%	35	53.8%	32	45.7%	72	49.3%
Not more information	6	54.5%	30	46.2%	38	54.3%	74	50.7%
Total	12	100.0%	65	100.0%	70	100.0%	146	100.0%
χ^2=0.963; df=2; p=0.618; Sig. ≥0.1								
Interval information								
More regularly	11	91.7%	45	72.6%	43	61.4%	99	68.8%
Not more regularly	1	8.3%	17	27.4%	27	38.6%	45	31.3%
Total	12	100.0%	62	100.0%	70	100.0%	144	100.0%
χ^2=5.103; df=2; p=0.078; Sig. <0.1								

The table demonstrates that no relationship between the amount of information provided and the age of the firms exists. Regarding the interval of information provided, it can be stated that younger firms more often indicated to have provided information more regularly after the guarantee from the guarantee bank was obtained. For these firms, information asymmetries might have been reduced. To further analyse the statistically significant relationship, Cramer's V was computed (Malhotra, 2010; Bühl, 2008; Brosius, 2006). The value of 0.188 indicates a small association between the two variables.

Relation between information and bank

An interesting question is whether the information behaviour differs according to the bank an SME received a loan from. Table 4.21 contains the results of the contingency tables and chi-square tests of the variables about the information behaviour and the bank.

Table 4.21: Information (PII, Q3c,d) vs. type of bank (PIII, Q5)

	Bank							
	Savings bank		Co-operative		Private bank		Total	
Amount information								
More information	31	55.4%	33	45.2%	6	40.0%	70	48.6%
Not more information	25	44.6%	40	54.8%	9	60.0%	74	51.4%
Total	56	100.0%	73	100.0%	15	100.0%	144	100.0%
χ^2=1.804; df=2; p=0.406; Sig. ≥0.1								

Table 4.21 (continued)

	Bank							
	Savings bank		Co-operative		Private bank		Total	
Interval information								
More regularly	43	76.8%	46	63.9%	8	57.1%	97	68.3%
Not more regularly	13	23.2%	26	36.1%	6	42.9%	45	31.7%
Total	56	100.0%	72	100.0%	14	100.0%	142	100.0%
χ^2=3.315; df=2; p=0.191; Sig. ≥0.1								

The table illustrates that no statistically significant relationship exists between the information behaviour and the bank a SME receives a loan from.

Interim conclusion about the information behaviour

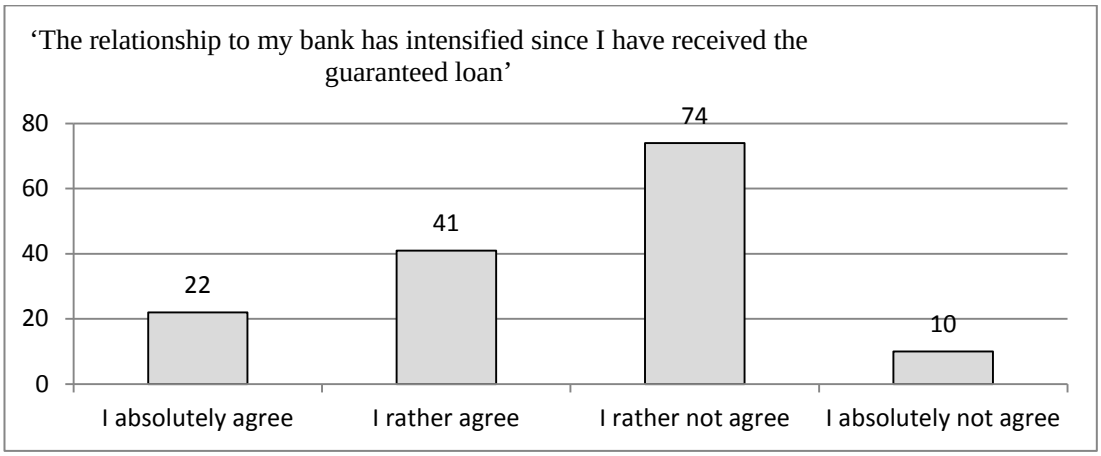
To evaluate whether the provision of a guarantee from a guarantee bank can reduce existing information asymmetries contingency tables and chi-square tests were computed. The statistically significant results indicated that smaller firms provided more information since they received the loan including the guarantee. Regarding the interval of information provided, statistically significant relationships can be confirmed for smaller firms, firms with a legal form of unlimited liability and younger firms. Younger and smaller firms especially had problems in obtaining bank loans due to information asymmetries (Berger and Udell, 1998; Zimmermann, 2007; Craig et al. 2008; Ortiz-Molina and Penas, 2008; Columba et al. 2010). The results have demonstrated that for these firms, guarantees from a guarantee bank can be considered as beneficial instrument to mitigate asymmetric information.

4.5 Bank-borrower relationships

To test whether guarantees from the guarantee bank can alter the lending behaviour of banks in a sustainable way (proposition 3b), special attention was paid to the creation of bank-borrower relationships. The literature review has demonstrated that lending relationships have a direct impact on the availability of loans for firms (Petersen and Rajan, 1994; Harhoff and Körting, 1998; Cole, 1998). Therefore, the respondent firms were asked to state whether they ‘absolutely agree’ (value 1), ‘rather agree’ (value 2), ‘rather not agree’ (value 3) or ‘absolutely not agree’ (value 4) to the statement: ‘The relationship to my bank has intensified since I have received the guaranteed loan’ (Part II, Q 3f).

In a first step, univariate analyses have been conducted to find out whether lending relationships were intensified or created. The frequency distribution of the answers to the statement concerning the lending relationship revealed that only a low number of the respondents agreed. Figure 4.8 shows the number of answers to the statement mentioned above.

Figure 4.8: Frequency distribution of intensification of relationship



For the majority of all respondents the relationship to their bank was not intensified since the loan including the guarantee was received. This is also demonstrated by the mean value of 2.49 (standard deviation 0.831). Although the share of respondents that confirmed an intensification of the bank-borrower relationship is rather low, the following sections will analyse whether relationships between demographic factors and the creation of a lending relationship exist. It is expected that especially firms that are related to a higher probability of default had the opportunity to establish a better relationship to the bank to demonstrate their credibility. These firms would not have obtained this opportunity if the guarantee had not been provided. Therefore, it will be tested whether the guarantees established a basis for a sustainable reduction of credit restrictions for these firms. This follows the assumption that relationship lending can reduce information asymmetries (Berger and Udell, 2002) which are considered to be a main problem of restricted access to bank loans for SMEs (Berger and Udell, 1998). The expected relationships were tested by computing cross tabulations and chi-square tests. The answers to the question about the lending relationship were categorized. Firms that absolutely or rather agreed to the statement that the relationship had intensified were labeled under the category 'intensified'. The category 'not intensified' contains those firms that did rather not or absolutely not agree to the statement.

Relation between bank-borrower relationship and number of employees

Smaller SMEs are associated with a higher probability of default (Creditreform, 2012, 2009; Waschbusch and Straub, 2008) which might make banks more reluctant in providing loans to these firms. Therefore, the establishment of a lending relationship could be of a certain benefit for these firms. To test whether the loan including a guarantee from the guarantee bank fosters the creation of a bank-borrower relationship for these firms, statistical tests were run. The results presented in Table 4.22 below demonstrate that the expected relationship cannot be confirmed.

Table 4.22: Lending relationship (PII, Q3f) vs. number of employees (PIV, Q5)

	Employees					
	≤ 9 employees		> 9 employees		Total	
Relationship						
Intensified	37	44.0%	25	41.7%	62	43.1%
Not intensified	47	56.0%	35	58.3%	82	56.9%
Total	84	100.0%	60	100.0%	144	100.0%
χ^2=0.081; df=1; p=0.776; Sig. ≥0.1						

Smaller firms did not indicate a stronger intensification of the relationship to the lending bank than bigger firms. For all firms, more than half of all respondents denied an intensification of the lending relationship.

Relation between bank-borrower relationship and legal form

A more intense relationship to the lending bank could be beneficial for firms with limited liability because these firms are associated to a higher risk for the bank. Table 4.23 shows the results of the chi-square test and the contingency table which were run to test whether a relationship between the legal form and the creation of a lending relationship can be assessed.

Table 4.23: Lending relationship (PII, Q3f) vs. legal form (PIV, Q1)

	Legal form					
	Unlimited		Limited		Total	
Relationship						
Intensified	31	44.9%	31	42.5%	62	43.7%
Not intensified	38	55.1%	42	57.5%	80	56.3%
Total	69	100.0%	73	100.0%	142	100.0%
χ^2=0.087; df=1; p=0.768; Sig. ≥0.1						

The presented results show no relationship between the legal form and the lending relationship. This indicates that the creation of a lending relationship was not related to the legal form of a firm.

Relation between bank-borrower relationship and industrial sector

Whether SMEs of industrial sectors which are associated to a higher risk show a stronger agreement with the statement about the intensification of the lending relationship is presented in Table 4.24.

Table 4.24: Lending relationship (PII, Q3f) vs. industrial sector groups (PIV, Q3)

	Industrial sector					
	Worse solvency		Better solvency		Total	
Relationship						
Intensified	54	42.9%	9	42.9%	63	42.9%
Not intensified	72	57.1%	12	57.1%	84	57.1%
Total	126	100.0%	21	100.0%	147	100.0%
χ^2=0.000; df=1; p=1.000; Sig. ≥0.1						

There is no perceivable difference between firms of industrial sectors that are riskier than the average and those which are less risky than the overall economy. Again, no relationship between the two variables was found.

Relation between bank-borrower relationship and age of the firm

To test whether young firms perceive an intensification of their lending relationship after they have obtained the loan, contingency table and chi-square test were run between these two variables. The results are illustrated in Table 4.25 below.

Table 4.25: Lending relationship (PII, Q3f) vs. age of the firms (PIV, Q2)

	Age of the firm							
	1-3 years		4-9 years		>9 years		Total	
Relationship								
Intensified	5	41.7%	27	41.5%	31	44.9%	63	43.2%
Not intensified	7	58.3%	38	58.5%	38	55.1%	83	56.8%
Total	12	100.0%	65	100.0%	69	100.0%	146	100.0%
χ^2=0.168; df=2; p=0.919; Sig. ≥0.1								

The results indicate that no relationship between the age of a firm and the creation of a lending relationship exists. Through all categories of firm age, the majority of all SMEs denied that the relationship to the bank had intensified.

Relation between bank-borrower relationship and bank

Whether the intensification of the bank-borrower relationship depends on the bank a SME received the loan from is presented in Table 4.26.

Table 4.26: Lending relationship (PII, Q3f) vs. type of bank (PIII, Q5)

	Bank							
	Savings bank		Co-operative		Private bank		Total	
Relationship								
Intensified	26	45.6%	31	42.5%	5	33.3%	62	42.8%
Not intensified	31	54.4%	42	57.5%	10	66.7%	83	57.2%
Total	57	100.0%	73	100.0%	15	100.0%	145	100.0%
χ^2=0.737; df=2; p=0.692; Sig. ≥0.1								

The results indicate that no relationship can be assessed.

Relation between bank-borrower relationship and information behaviour

It is worth analysing the relation between the information behaviour and the bank-borrower relationship. The collection of information about the borrower helps banks to learn about the borrower's creditworthiness and financial outlook. This information is considered to be crucial for making a lending decision (Berger and Udell, 2002; Diamond, 1984; Elyasiani and Goldberg, 2004). Table 4.27 illustrates the results of the statistical tests.

Table 4.27: Lending relationship (PII, Q3f) vs. information (PII, Q3c,d)

	Amount information					
	More information		Not more information		Total	
Relationship						
Intensified	43	60.6%	19	25.3%	62	42.5%
Not intensified	28	39.4%	56	74.7%	84	57.5%
Total	71	100.0%	75	100.0%	146	100.0%
χ^2=18.528; df=1; p=0.000; Sig. <0.01						

Table 4.27 (continued)

	Interval information					
	More regularly		Not more regularly		Total	
Relationship						
Intensified	48	49.0%	15	32.6%	63	43.8%
Not intensified	50	51.0%	31	67.4%	81	56.2%
Total	98	100.0%	46	100.0%	144	100.0%

χ^2=3.409; df=1; p=0.065; Sig. <0.1

The results confirm a relationship between the information behaviour and the bank-borrower relationship. Firms that provided more information to their bank also indicated an intensification of the lending relationship. However, the positive association between the two variables is not very strong (0.356). Firms that stated that information was not provided more regularly after the loan was received also show a high agreement with the statement that the relationship to the bank has not intensified. The association between the two variables is very small (0.154). These results confirm the assumption that lending relationships can mitigate information asymmetries (Behr et al., 2011; Cole, 1998).

Interim conclusion about bank-borrower relationships

The results have not confirmed the assumption that SMEs which are related to a higher probability of default take the opportunity to create a more intense relationship to their bank after receiving the loan including a guarantee from the guarantee bank. This was expected to be one mechanism to sustainably mitigate credit restrictions for SMEs. However, the results indicate that a positive relation between the information behaviour and the lending relationship exists. Accordingly, the provision of information can foster the relationship between a bank and a SME which is expected to have a positive impact on loan availability (Behr et al. 2011; Cole 1998).

4.6 Mitigation of credit restrictions

For facilitating the statistical analyses about whether guarantees from guarantee banks help to mitigate credit restrictions for SMEs (proposition 4), the web survey contained a question about the need for a follow-up loan as well as a question about the need for a follow-up guarantee for this loan (Part II, Q 4 and 5). Out of 152 respondent firms, 61 firms stated that they applied for another loan after they

received the initial loan including the guarantee. These 61 firms were asked to indicate whether they needed another guarantee for the follow-up loan. This question was designed to allow an assessment about the mitigation of credit restrictions. It was suggested that firms that needed no guarantee for the follow-up loan indeed have 'graduated' to borrowers without a guarantee like presented in the framework about the learning process in Section 2.4. In the present sample, only 6 SMEs (9.8%) out of the overall 61 firms that applied for a follow-up loan needed a follow-up guarantee from the guarantee bank. Due to the fact that the sample size for bivariate statistical tests about the mitigation of credit restrictions reduced to 61 whereas only 6 respondents needed a guarantee, representative status of statistical analyses cannot be achieved. This has to be considered when discussing the results. The main aim of this section is to find out whether the information behaviour and the lending relationship had an impact on the decision about the need for a follow up-guarantee. To test this, chi-square tests were conducted and will be presented. To complete the analyses, the relationships between the demographic variables and the need for a follow-up guarantee were also tested but no crucial relation was found. The results of these tests are shown in Appendix XI.

Mitigation of credit restrictions and information

Information asymmetries are considered to be one reason for credit restrictions (Graham, 2004; Stiglitz and Weiss, 1981). Therefore, the investigation about the mitigation of credit restrictions starts by analysing whether those firms that needed a follow-up guarantee provided more or more regular information to their banks. One could assume that those firms that provided more/more regular information would not need a follow-up guarantee since asymmetric information could have been reduced. Table 4.28 presents the results of contingency tables run for the variables about the information behaviour and the need for a follow-up guarantee.

Table 4.28: Follow-up guarantee (PII, Q5) vs. information (PII, Q3c,d)

	Amount information					
	More information		Not more information		Total	
Follow-up guarantee						
Yes	4	12.9%	2	7.1%	6	10.2%
No	27	87.1%	26	92.9%	53	89.8%
Total	31	100.0%	28	100.0%	59	100.0%
χ^2=0.534; df=1; p=0.465; Sig. ≥0.01						

Table 4.28 (continued)

	Interval information					
	More regularly		Not more regularly		Total	
Follow-up guarantee						
Yes	5	13.2%	1	5.0%	6	10.3%
No	33	86.8%	19	95.0%	52	89.7%
Total	38	100.0%	20	100.0%	58	100.0%
χ^2=0.940; df=1; p=0.332; Sig. ≥0.01						

Within each contingency table, two cells (50.0%) have an expected count of less than 5. Anyway, due to the very small number of SMEs that needed a follow-up loan, no definite statement can be made. Regarding the results above, it rather seems as if the information behaviour did not have any impact on the decision about whether a follow-up guarantee was needed.

Mitigation of credit restrictions and lending relationship

It is also assumed that a close bank-borrower relationship helps to overcome credit restrictions (Cole, 1998; Harhoff and Körting, 1998). To test whether the lending relationship had a positive impact on the reduction of credit restrictions, the relation between the need for a follow up loan and the bank-borrower relationship was tested. Table 4.29 shows the results of the analysis.

Table 4.29: Follow-up guarantee (PII, Q5) vs. lending relationship (PII, Q3f)

	Relationship					
	Intensified		Not intensified		Total	
Follow-up guarantee						
Yes	3	9.7%	3	10.3%	6	10.0%
No	28	90.3%	26	89.7%	54	90.0%
Total	31	100.0%	29	100.0%	60	100.0%
χ^2=0.007; df=1; p=0.931; Sig. ≥0.01						

Again, the number of those SMEs that needed a follow-up loan is too small to allow for reliable conclusions. Moreover, two cells (50.0%) within the contingency table have an expected count of less than 5. Those SMEs that reported an intensification of the relationship to their bank indeed needed follow-up loans. This suggests the assumption that no relationship is perceivable.

Interim conclusion about mitigation of credit restrictions

No conclusion about the impact of the lending relationship or the information behaviour can be made due to the small sample size. However, as the vast majority of firms did not need a follow-up guarantee, one could assume that between the first loan application and the second some things must have changed. Otherwise, the banks would not have been willing to provide the future loans without a guarantee. However, it cannot be said that this was because of a reduction of information asymmetries or because of relationship lending. Other reasons could, for example, be that the firm had grown in the meantime and that for the follow-up loan sufficient tangible assets could have been provided for collateral. Thus, no concluding assessment about the ability of guarantees from the guarantee bank to mitigate credit restrictions in a sustainable way can be made at this stage.

4.7 Cluster analysis of variables about existing relationships

Further analyses were undertaken by clustering the respondent firms according to the bank-borrower relationship. Within the web survey, firms had to state how long the relationship to their bank already existed at the time they applied for the loan (part III, question 1), how often they were in contact with their bank (part III, question 2) and how often their bank-managers (=contact persons) changed in the past (part III, question 3). The answers to these questions allowed an assessment about the intensity and stability of the existing relationships between the banks and the borrowers.

Hierarchical cluster analysis of the three variables was conducted by using Ward's method. In the Ward's procedure, means for all variables are calculated for each cluster. In a next step, the squared Euclidean distance to the means of the clusters is computed and the sums of the distances are built for all cases. Those clusters are merged that show the smallest growth of the squared within cluster distance. In the agglomerated schedule, the coefficient is the within cluster sum of squares at that step. Table 4.30 below contains the last twenty rows of the agglomerated schedule of the present cluster analysis.

Table 4.30: Results of the hierarchical cluster analysis

Agglomeration schedule

	Cluster combined			Stage cluster first appears		
Stage	Cluster 1	Cluster 2	Coefficients	Cluster 1	Cluster 2	Next Stage
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
127	4	49	28,721	118	113	143
128	6	129	31,491	96	24	136
129	2	9	34,467	112	85	137
130	24	88	37,667	102	34	135
131	3	15	40,900	116	123	140
132	11	61	44,283	115	74	137
133	13	18	47,697	119	121	142
134	19	28	51,447	103	89	140
135	10	24	56,839	81	130	145
136	6	51	62,267	128	122	138
137	2	11	69,392	129	132	139
138	6	8	78,920	136	125	141
139	2	5	89,762	137	124	143
140	3	19	103,567	131	134	142
141	6	17	121,911	138	126	145
142	3	13	141,826	140	133	144
143	2	4	163,013	139	127	144
144	2	3	213,418	143	142	146
145	6	10	272,214	141	135	146
146	2	6	487,782	144	145	0

The coefficients of the agglomerated schedule and the main branches of the dendrogram presented in Appendix IX show that different numbers of clusters were conceivable. To decide about the number of clusters that should be analysed, coefficients in the table can be considered (Norusis, 2009; Schendera, 2010; Malhotra, 2010). The highest distance between the clusters can be found between the stages 145 and 146. Therefore, the two-cluster solution was analysed in a first step. However, the results indicated that two clusters did not allow sufficient differentiation between the groups. The groups were not considered to be sufficiently heterogeneous among each other. Accordingly, a three-cluster solution was analysed in the second step. But again, the groups were not considered to be sufficiently heterogeneous among each other. After running analyses for the four-cluster solution

it became clear that the four-cluster solution was appropriate as the groups were sufficiently homogeneous as well as sufficiently heterogeneous among themselves. Regarding the results of Table 4.30, it becomes visible that between the stages 143 and 144 the value increases by 50,000 points. This is the first 'higher' increase perceivable. Therefore, the decision for four clusters can not only be justified by the composition of these clusters but also by the distances at which the clusters are combined.

To demonstrate the characteristics of the four clusters, chi-square tests were run for the ordinal variables used for the hierarchical cluster analysis. The results of two of them are presented in Table 4.31.

Table 4.31: Clusters vs. relationship (PIII, Q1) and contact frequency (PIII, Q2)

	Cluster									
	Cluster #1		Cluster #2		Cluster #3		Cluster #4		Total	
Duration bank-borrower relationship at the time of applying for the loan										
No relationship	0	0.0%	0	0.0%	29	80.6%	23	85.2%	52	35.4%
1-3 years	0	0.0%	5	11.9%	7	19.4%	4	14.8%	16	10.9%
4-9 years	13	31.0%	15	35.7%	0	0.0%	0	0.0%	28	19.0%
> 9 years	29	69.0%	22	52.4%	0	0.0%	0	0.0%	51	34.7%
Total	42	100.0%	42	100.0%	36	100.0%	27	100.0%	147	100.0%
$\chi^2 = 138.027$; df = 9; p = 0.000; Sig. < 0.01										

	Cluster									
	Cluster #1		Cluster #2		Cluster #3		Cluster #4		Total	
Contact frequency										
No contact	1	2.4%	0	0.0%	6	16.7%	0	0.0%	7	4.8%
1-2 times a year	25	59.5%	0	0.0%	20	55.6%	0	0.0%	45	30.6%
3-5 times a year	16	38.1%	6	14.3%	10	27.8%	0	0.0%	32	21.8%
> 5 times a year	0	0.0%	36	85.7%	0	0.0%	27	100.0%	63	42.9%
Total	42	100.0%	42	100.0%	36	100.0%	27	100.0%	147	100.0%
$\chi^2 = 139.105$; df = 9; p = 0.000; Sig. < 0.01										

More than 20% of the cells within the contingency tables have an expected count of less than 5. However, since the aim was to further characterize the four clusters, categorization of the variables was no option. Table 4.31 illustrates that cluster #1 and cluster #2 are characterized by longer bank-borrower relationships. The majority of all respondent firms within these clusters had a relationship to the lending bank of more than nine years. The opposite applies to cluster #3 and cluster #4. The vast majority of all firms within these clusters did not have an existing relationship to the

lending bank when they received the loan including the guarantee from the guarantee bank.

Regarding the contact frequency, it becomes visible that the majority of the firms in cluster #1 and cluster #3 stated to have less frequent contact to their bank, whereas the firms of cluster #2 and cluster #4 stated to have more than 5 times contact to their bank. Consequently, the contact frequency is stronger for the firms of cluster #2 and cluster #4.

Summarizing the results of the above presented tables allows characterizing and labelling the firms within the four clusters on the basis of the existing relationship to the bank when receiving the loan. Table 4.32 presents the categorization of the clusters.

Table 4.32: Characteristics of the four clusters

Cluster	**Duration relationship**	**Contact frequency**	**Label**
#1	> 9 year	1-2 times a year	Reserved Old Hands
#2	> 9 years	> 5 times a year	Present Old Hands
#3	No relationship	1-2 times a year	Reserved Rookies
#4	No relationship	> 5 times a year	Present Rookies

According to the existing or non-existing bank-borrower relationship the clusters have been labelled either ‘Old Hands’ or ‘Rookies’. Rookies are those firms that had no relationship to the bank at the time they obtained the loan. These firms only just established a relationship to the bank by forging a first link. Old Hands, however, knew the lending bank for a long time and the bank knew them. Another differentiation in the labelling was chosen for the contact frequency. Firms that had more than five times contact to their bank were labelled with the affix ‘present’ as these firms seemed to be more present at their bank. Firms with 1-2 contacts per year were labelled with the affix ‘reserved’. This leads to four different groups according to the clustering: Present Old Hand, Reserved Old Hands, Present Rookies and Reserved Rookies.

In the following, it will be tested whether crucial differences between the four groups exist concerning the variables known from the propositions tests of the prior sections.

Relations between clusters and demographic variables

Whether differences between the four clusters and the number of employees exist can be seen in Table 4.33 below.

Table 4.33: Clusters vs. number of employees (PIV, Q5)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Number of employees										
≤ 9 employees	22	53.7%	18	43.9%	27	75.0%	16	59.3%	83	57.2%
> 9 employees	19	46.3%	23	56.1%	9	25.0%	11	40.7%	62	42.8%
Total	41	100.0%	41	100.0%	36	100.0%	27	100.0%	145	100.0%
$\chi^2 = 7.879$; df = 3; p = 0.049; Sig. < 0.05										

As the results indicate, Old Hands had a higher share of bigger firms. By contrast, Rookies tended to be smaller firms. Regarding the Present Rookies, three out of four of them had between 1 and 9 employees. Comparing the groups of Rookies and Old Hands among each other, the results demonstrate that those firms that indicated more contacts to their bank (denoted by the affix ‘present’) tended to be smaller firms. Consequently, it can be assumed that smaller firms were more often in contact with their bank. The results are statistically significant. The association between the two variables is low (0.233).

To find out whether a relationship between the four clusters and the legal form for the groups exists, contingency table and chi-square test were run for these variables. The relationship expected in this context is that within both groups, the Rookies and the Old Hands, firms with limited liability would have more frequent contact with the bank (denoted by the affix ‘present’). This would be due to the higher risk perceived for these firms. One could assume that banks would be more interested in more frequent contact to obtain a deeper knowledge of the business success of these firms. The results of the analysis are presented in Table 4.34 below.

Table 4.34: Clusters vs. legal form (PIV, Q1)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Legal form										
Unlimited liability	22	56.4%	10	23.8%	21	60.0%	13	48.1%	66	46.2%
Limited liability	17	43.6%	32	76.2%	14	40.0%	14	51.9%	77	53.8%
Total	39	100.0%	42	100.0%	35	100.0%	27	100.0%	143	100.0%

$\chi^2 = 12.832$; df = 3; p = 0.005; Sig. < 0.01

The statistically significant results demonstrate that the expected relationship cannot be confirmed. By contrast, Present Old Hands as well as Present Rookies show a higher share of firms with unlimited liability compared to their 'reserved' counterparts. Consequently, the expected relationship cannot be confirmed. The association between the two variables is not very strong (0.300).

Another relationship expected is between the contact frequency and the industrial sector of the firm. Again, this is associated with the risk perception of the banks. Firms in the industrial sector with a worse solvency than the average detected by the solvency index of Creditreform (Creditreform, 2010) are expected to have closer contact to their bank. Whether this applies for the firms of the sample can be gathered from Table 4.35.

Table 4.35: Clusters vs. industrial sector groups (PIV, Q3)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Industrial sector										
Worse solvency	37	88.1%	35	83.3%	33	91.7%	22	81.5%	127	86.4%
Better solvency	5	11.9%	7	16.7%	3	8.3%	5	18.5%	20	13.6%
Total	42	100.0%	42	100.0%	36	100.0%	27	100.0%	147	100.0%

$\chi^2 = 1.844$; df = 3; p = 0.605; Sig. $\geq$ 0.1

The findings illustrate that the vast majority of all four clusters were engaged in industrial sectors that were worse than the overall economy. However, no statistically significant relationship between the clusters and the industrial sector is found.

As Rookies are new customers to the bank, a relationship between the age of a firm and the clusters can be expected. Regarding the contact frequency, it can be expected that younger firms would have closer contact to the bank because of the higher

perceived risk. Table 4.36 demonstrates the results of the statistical analysis about the expected relationships.

Table 4.36: Clusters vs. age of the firms (PIV, Q2)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Age of the firm										
1-3 years	2	4.8%	1	2.4%	3	8.3%	4	14.8%	10	6.8%
4-9 years	14	33.3%	11	26.2%	26	72.2%	12	44.4%	63	42.9%
> 9 years	26	61.9%	30	71.4%	7	19.4%	11	40.7%	74	50.3%
Total	42	100.0%	42	100.0%	36	100.0%	27	100.0%	147	100.0%
$\chi^2 = 27.153$; df = 6; p = 0.000; Sig. < 0.01										

The results can only be explained from a descriptive perspective since 33.3 per cent of the cells have a count of less than 5. While Old Hands contain a higher number of firms older than 9 years, Rookies show a higher share of younger firms. To further investigate these results, the purpose of the loan was analysed. Table 4.37 illustrates the relationship between the purpose of the loan (PII, Q1) and the clusters. The relationship is illustrated by a contingency table. Multiple answers were allowed. Therefore, results of the chi-square tests for all of the three options are demonstrated separately.

Table 4.37: Clusters vs. purpose of the loan (PII, Q1)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Purpose of the loan										
Investment	14	25.9%	14	27.4%	9	23.7%	8	27.6%	45	26.2%
Start-up	22	40.7%	16	31.4%	25	65.8%	17	58.6%	80	46.5%
Working capital	18	33.3%	21	41.2%	4	10.5%	4	13.8%	47	27.3%
Total	54	100.0%	51	100.0%	38	100.0%	29	100.0%	172	100.0%
Investment: $\chi^2 = .839$; df = 3; p = 0.840; Sig. ≥ 0.1										
Start-up: $\chi^2 = 8.653$; df = 3; p = 0.034; Sig. < 0.05										
Working capital: $\chi^2 = 19.421$; df = 3; p = 0.000; Sig. < 0.01										

The results demonstrate that Rookies show a higher share of start-up loans while Old Hands more often received loans for financing working capital. Present Old Hands also show a relatively high share of start-up loans that might be used for mergers or acquisitions, for example. For the statistically significant relationships, Cramer's V

was calculated. For start-up loans, the association is low (0.243). For working capital, the association is not very high (0.363), too.

Finally, the relationship between the clusters and the type of bank an SME obtained the loan from was analysed. The results are highlighted in Table 4.38.

Table 4.38: Clusters vs. type of bank (PIII, Q5)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Bank										
Savings bank	21	50.0%	14	35.0%	11	30.6%	8	29.6%	54	37.2%
Co-operative bank	18	42.9%	19	47.5%	20	55.6%	18	66.7%	75	51.7%
Private bank	3	7.1%	7	17.5%	5	13.9%	1	3.7%	16	11.0%
Total	42	100.0%	40	100.0%	36	100.0%	27	100.0%	145	100.0%

$\chi^2 = 8.459$; df = 6; p = 0.206; Sig. ≥ 0.1

To analyse the relationship between the duration of the relationship to a bank and the type of bank, the rows of the contingency table need to be considered. Overall 54 SMEs (=100.0%) received their loans from savings banks. Out of these 54 firms, 19 firms were Rookies. This is equivalent to 35.2 per cent. Out of the overall 75 firms that obtained the loan from a co-operative bank, 38 firms (50.7%) were Rookies. Regarding the customers of private banks, 37.5 per cent were Rookies. These figures demonstrate that SMEs that are looking for a new bank when applying for a loan tend to switch over to a co-operative bank. Old Hands also show high shares of co-operative banks. It also becomes visible that Present Old Hands show the highest share of savings banks within the sample. However, due to the fact that 33.3 per cent of the cells had an expected count of less than 5, reliable statistical results cannot be generated.

Relation between clusters and access to bank loans

Regarding the relationship between the clusters and the access to bank loans it is expected that Rookies would report more difficulties in obtaining bank loans because these firms had to find a new bank to receive the loan that did not have any information about them. The results of the chi-square test are presented in Table 4.39 below.

Table 4.39: Clusters vs. access to bank loans (PI, Q1)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Difficulties in obtaining bank loans										
Not severe	8	19.0%	5	11.9%	4	11.1%	1	3.7%	18	12.2%
Neutral	9	21.4%	11	26.2%	8	22.2%	13	48.1%	131	29.9%
Severe	25	59.5%	26	61.9%	24	66.7%	13	48.1%	12	59.9%
Total	42	100.0%	42	100.0%	36	100.0%	27	100.0%	143	100.0%

χ^2= 9.225; df = 6; p = 0.161; Sig. ≥ 0.1

The table above indicates that the expected relationship cannot be confirmed. Rookies did not report more difficulties in obtaining bank loans than Old Hands. While Reserved Rookies show the lowest percentage of severe difficulties, the differences between the other clusters are only marginal. This leads to the conclusion that no crucial relationship between the clusters and the judgement about the access to bank loans exists.

Relation between clusters and significance of guarantees

Section 4.3 has demonstrated that a vast majority of all respondents in this sample confirmed a high significance of guarantees from the guarantee bank to obtain a bank loan. Whether this also applies for all four clusters is presented in Table 4.40 below.

Table 4.40: Clusters vs. significance guarantee (PII, Q3e)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Significance guarantee										
Guarantee was crucial	36	87.8%	35	89.7%	36	100.0%	24	88.9%	131	91.6%
Guarantee was not crucial	5	12.2%	4	10.3%	0	0.0%	3	11.1%	12	8.4%
Total	41	100.0%	39	100.0%	36	100.0%	27	100.0%	143	100.0%

χ^2 = 4.505; df = 3; p = 0.212; Sig. ≥ 0.1

Within each contingency table, four cells (50.0%) have an expected count of less than 5. Anyway, the results show that guarantees are important for all four clusters.

Relation between clusters and information behaviour

Table 4.41 presents the contingency tables and chi-square tests of the analysis about the relationship between the four clusters and the provision of information. It is expected that Rookies would provide more information and more regular information

to their bank. As no relationship between the banks and these firms previously existed, one would assume that a reduction of information asymmetries would result.

Table 4.41: Clusters vs. information behaviour (PII, Q3c,d)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Amount information										
More information	19	46.3%	17	43.6%	18	50.0%	16	61.5%	70	49.3%
Not more information	22	53.7%	22	56.4%	18	50.0%	10	38.5%	72	50.7%
Total	41	100.0%	39	100.0%	36	100.0%	26	100.0%	142	100.0%
$\chi^2 = 2.217$; df = 3; p = 0.529; Sig. ≥ 0.1										

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Interval information										
More regularly	28	70.0%	23	59.0%	24	70.6%	22	81.5%	97	69.3%
Not more regularly	12	30.0%	16	41.0%	10	29.4%	5	18.5%	43	30.7%
Total	40	100.0%	39	100.0%	34	100.0%	27	100.0%	140	100.0%
$\chi^2 = 8.872$; df = 3; p = 0.276; Sig. ≥ 0.1										

The results demonstrate that Rookies indeed show a slightly higher agreement that they provided more information and more regular information to the commercial bank since they received the loan including a guarantee from the guarantee bank. However, the differences are not crucial and not statistically significant.

One could assume that SMEs with a higher contact frequency (labelled by the affix ‘present’) would also provide more information and more regular information to their banks. However, this is not completely confirmed by the results of the analysis. While Present Old Hands indeed show a higher agreement with both statements than Reserved Old Hands, Present Rookies show less agreement with the statements about the provision of information than Reserved Rookies.

Relation between clusters and bank-borrower relationship

Since Rookies had no relationship to their banks when receiving the loans, it is expected that these firms would show a higher agreement with the statement about the intensification of the bank-borrower relationship. Moreover, it is expected that Present Rookies as well as Present Old Hands would show a higher agreement as a positive relationship between the contact frequency and the intensification of the

relationship can be assumed. Table 4.4 shows the results of the analysis for testing the expected relationships.

Table 4.42: Clusters vs. lending relationship (PII, Q3f)

	Cluster									
	Present Old Hands		Reserved Old Hands		Present Rookies		Reserved Rookies		Total	
Relationship										
Intensified	17	41.5%	16	42.1%	15	41.7%	12	44.4%	60	42.3%
Not intensified	24	58.5%	22	57.9%	21	58.3%	15	55.6%	82	57.7%
Total	41	100.0%	38	100.0%	36	100.0%	27	100.0%	142	100.0%

$\chi^2 = 0.069$; df = 3; $p = 0.995$; Sig. ≥ 0.1

The results of the table above show that the expected relationships cannot be confirmed. There is neither a sign for more intensification of the lending relationship for the Rookies nor an indication that the Present Old Hands or the Present Rookies show a higher agreement with the statement that the relationship to their bank intensified.

Interim conclusion about clusters

The clustering was based on the existing relationship between the SMEs and their banks at the time the SMEs received the loans including a guarantee from the guarantee banks. The analyses demonstrate that some interesting relationships between the existing bank-borrower relationships and the other variables exist. Old Hands were typically bigger and older firms while Rookies were smaller and younger firms. Rookies mostly received a guarantee for start-up loans. In most cases, these loans were provided from co-operative banks. Present Old Hands also received a high share of start-up loans. However, Old Hands in general and Reserved Old Hands in particular also show the highest share of loans for working capital. SMEs with a higher contact frequency were typically smaller firms with a legal form of unlimited liability. All firms indicated a high importance of guarantees from the guarantee bank for obtaining the bank loan. Regarding the provision of information, the results have demonstrated that Rookies tended to provide more information and more regular information to the lending banks from the time they received guarantees from the guarantee bank.

5 Interview results

The qualitative analysis is guided by the theoretical framework derived from the literature review. The answers of the ten interviewees have been categorized and coded according to the propositions of this study. While the quantitative analysis covers the prospects of SMEs, the qualitative analysis is about the experiences and options of the banks. Table 5.1 illustrates the characteristics of the ten interviewees sorted by the chronological order of the interviews.

Table 5.1: Details about interviewees

No.	Bank	Balance sheet total (2011)	Position	Number customers	Segment	Job experien-ces	Dura-tion
I1	Savings Bank	> 1 bn. €	BCC	160	0.25-1.0 million € turnover	15 years	70 min.
I2	Savings Bank	>1 bn. €	Head of BCC	80	>1 million € turnover	20 years	70 min.
I3	Savings Bank	>3 bn. €	BCC	70	2.5-250 million € turnover	14 years	80 min.
I4	Private Bank	<6 bn. €	BCC	80	2.5-250 million € turnover	6 years	90 min.
I5	Private Bank	<6 bn. €	Head of BCC & BCC	400	>25 million € turnover	10/6 years	90 min.
I6	Co-operative	>1 bn. €	BCC	200	no segmentation	10 years	60 min.
I7	Co-operative	>1 bn. €	Head of BCC	200	Volume >20,000 €	20 years	90 min.
I8	Savings Bank	>1 bn. €	BCC	No statem.	Solely start-ups	14 years	70 min.
I9	Co-operative	>6 bn. €	BCC	No statem.	Venture capital	15 years	70 min.
I10	Co-operative	>1 bn. €	BCC	130-150	Volume >100,000 €	14 years	50 min.

The first column of Table 5.1 contains the number of each interviewee. These numbers insure anonymity and will be used in the direct citations of the interview analysis. The second column illustrates at which bank the interview partner works. The annual reports of the guarantee bank Hesse have demonstrated that within the years 2003 and 2008 most guarantees were provided by either savings banks or co-operative banks. These two bank types provided a more or less equal number of loans that included a guarantee from the guarantee bank and provided around 90 per cent of the overall loans that required a guarantee. The share of all guarantees provided for loans from private banks was relatively stable with 10%. These proportions are reflected as the choice of four interviewees from a savings bank (40%), four interviewees from a co-operative bank (40%) and two interviewees from

a private bank (20%). To provide an impression about the size of the banks the interviewees work for, column three contains the balance sheet total of the year 2011. To ensure maximum anonymity, the exact balance sheet total is not included. Therefore, only rough amounts are illustrated. Column four contains the job titles of the interviewees. All of them were either Business Client Consultants (BCC) or Head of the Business Client Consultants. However, even the Heads of BCC were actively engaged in consulting, and all had provided loans including a guarantee from the guarantee bank. The majority of all interviewees were males. Only I8 and I10 were females. Column five and six contain the number of customers (=firms) a bank manager is responsible for as well as the segment of the customers. The number of customers a single bank manager is responsible for normally is related to the amount of work connected to the customers of certain segments. As the table above demonstrates, the number of firms the interviewees are responsible for vary from 70 up to 400. In German banks, business clients are usually divided into several segments. Segmentation can be defined by business turnover, special types of financial instruments or the overall volume (assets and liabilities) of the firms. Most banks in the sample show segmentation according to the firm's turnover. One interviewee was responsible for special kinds of financing (I9). Interviewee I6 was from a rather small bank. At this bank, no segmentation was made due to the manageable number of business clients. Only two banks within the sample show segmentation according to the overall transaction volume at the bank which includes all loans and money investments (I7 and I10). Column seven demonstrates the working experience of the interviewees. As it can be seen, all interviewees can be considered as highly experienced in SME financing. Finally, the last column contains the duration of each interview in minutes.

The analysis of the interview results is structured as follows: Section 5.1 analyses the answers of the interviewees about the reasons for denying loans to SMEs. Why guarantees from the guarantee bank can make loans available to SMEs is analysed in Section 5.2. Section 5.3 analyses the impact of guarantees on the costs and the profitability of banks. Section 5.4 is about the information banks require or obtain as a consequence of the provision of loans including guarantees from the guarantee bank. Section 5.5 highlights the impact of guarantees on the relationship between the borrowers and the banks. Finally, section 5.6 is about the ability of guarantees from guarantee banks to mitigate credit restrictions for SMEs. Every section starts with

presenting the proposition that was considered and the questions of the interview guide (demonstrated in Appendix VII) that were asked of the interviewees. Where suitable and helpful, tables are presented that show the interviewees' answers categorized by the three types of banks. To underline the conclusions of the answers, some of the interviewees' responses are included in every section. Every section ends with an interim conclusion of the findings.

5.1 Reasons for denying a loan

All bank managers were asked about the reasons for difficulties in obtaining bank loans for certain SMEs. This was intended to find out whether proposition 1, (SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral) applies.

To find this out, all interviews started with the question about the reasons for insisting on a guarantee (part A, question 1). Another question that was typically asked in the beginning of the interview was about the existence of any exclusion criteria which impeded the provision of loans to SMEs even when a guarantee would be provided (part A, question 5). Table 5.2 shows the answers of the ten interviewees sorted by their banks. The table contains the absolute number of respondents as well as the share of the answers of all respondents within one banking group.

Table 5.2: Principles of making a loan decision

	Savings banks		Co-operative banks		Private banks		Total	
Business project is decisive	4	100.0%	4	100.0%	2	100.0%	10	100.0%
No general exclusions exist	4	100.0%	4	100.0%	1	50.0%	9	90.0%

The interviews revealed that the business project is a decisive factor when making a loan decision. All ten interviewees answered that the most important factor for making a loan decision is the business idea of the firm. They all mentioned that it is important that the SME that applies for a loan has a viable and promising business project. The response below demonstrates that it is very important that the bank believes in the future success of the business project.

> "If the concept fails in the forehand, (…) a loan will not be provided. (…) The concept has to be convincing. And we want to do that because we believe that it has a chance on the market, it has a future." [I2]

One difficulty at this stage is to define what makes a business project viable and promising for a bank. The interviewees said they considered the competition in the respective market, the experiences of the business owner, the infrastructure and the location of a business. This is demonstrated by the following statement:

> "Well, I always consider the region. That is a huge advantage simply because I have the market information. I know at which location other businesses previously failed. I have been business client consultant for around 15 years now and have watched a lot of businesses open and close. (…) For me, it is always important to see whether the business owner knows the market situation and the local characteristics. At the end of the day, it is solely the concept or the idea that has to convince me. And then, we can figure out how to collect sufficient collateral." [I8]

Since certain firm characteristics (e.g. the industrial sector) are related to higher probabilities of default and, therefore, to higher risk for the banks (Creditreform, 2012), it was intended to find out whether any general exclusions exist that preclude SMEs from obtaining bank loans. Nine banks out of ten stated to have no general exclusion. The only exception is the experience of the business owners. If the business owner is not qualified enough and this loss of expertise cannot be covered by another person in the business, banks will have no confidence in the business success. However, this can also be the case for firms that are engaged in very successful industrial sectors. The following passage demonstrates the meaning of the viability of the business project and the qualification of the business owner.

> "The industrial sector alone is not an exclusion factor when the business project is feasible. It is slightly different with the qualification of the business owner. If he or she has no business experiences and will not employ someone who has these qualifications, but the business idea requires these qualifications, then the loan will most likely not be provided. Because then, we don't believe in the success of the business project." [I1]

The next quotation illustrates the openness of banks concerning industrial sectors. It demonstrates the awareness of banks of the existence of good borrowers even in bad industrial sectors and the existence of bad borrowers in good industrial sectors. The decisive factor is a good business concept, which is examined very carefully.

> "Well, it is actually not important whether he is already a client, how long and which industrial sector he is engaged in. This is something we examine very thoroughly. We don't even have a general exclusion of industrial sectors. We prefer the good firms of bad industries rather than the bad firms of good industries. Well, we examine this very detailed and make our decision, then." [I3]

That some industrial sectors are indeed not as attractive for banks as others is demonstrated by the response of interviewee I7. However, this does not necessarily leads to the denial of a loan.

> "Well, there are indeed some difficult industrial sectors after which we don't mourn. But we have no general exclusions. We also would never say just because of a certain industrial sector we have to include a guarantee. Every industrial sector has good firms. This is something we examine individually." [I7]

One private bank indeed confirmed general exclusions. This bank is very profit-oriented, and financing SMEs is not considered profitable enough. This becomes visible in the statement of the interview partner.

> "Exclusion criteria are e.g. the personal creditworthiness, lack of equity capital, qualitatively or quantitatively inadequate documents, weak business projects, high liabilities and certain industrial sectors." [I5]

This quotation impressively illustrates the different business strategies of private banks and public banks like savings banks and co-operative banks. The latter are more oriented towards supporting SMEs and the region they are engaged in. For these banks, no general exclusions exist. This is surely due to the regional limitation of these banks (see Section 1.2).

An interim conclusion is that there are some difficulties perceivable in SMEs obtaining bank loans. These difficulties are mainly related to the feasibility of the business project. If the business idea is not promising, the bank will most likely not provide a loan. However, for the vast majority of banks no general exclusions exist. The role of collateral that has already been mentioned by some of the statements above will be examined in detail in the following section.

5.2 The meaning of guarantees

The interviewee responses included in Section 5.1 have illustrated that, first of all, the business project has to be convincing. If the business project is not convincing

and the bank does not believe in the success of the business, the bank will most likely not provide the loan. When the concept is convincing, banks take a deeper look into the inherent risk of a potential loan provision. This is demonstrated by the next statement.

> "We would never say we have grave doubts about the business concept and we just want to share the risk. That is not our business. (…) The concept is decisive. Well, the concept is determining. And in a second step we then look for the risk that we have to take on and whether this fits with our business intention." [I3]

Section 2.6 has illustrated that the overall default risk of a loan is defined by the expected loss and the unexpected loss. The expected loss is calculated by multiplying the probability of default with the exposure of default and the loss given default. The probability of default is defined by the creditworthiness of the borrower. A higher probability of default means a higher expected loss and, therefore, a higher default risk for the lending bank (Schulte and Horsch, 2004). Thus, when the risk related to the probability of default of a borrower appears to be too high, banks have to find a way to reduce the risk. This can be done by including collateral (Stiglitz and Weiss, 1981; Berger and Udell, 1990; Stefanovic, 2009). The following statement underlines these mechanisms. The interview partner talked about financing start-ups.

> "This is the most risky business for a bank. And when the customer has a good idea and I believe in the success of the business but no collateral can be provided, we look for an external partner." [I6]

These statements imply that banks accept higher probabilities of default when they are convinced of the business concept and can find someone who pledges additional collateral, thus takes on a certain amount of the risk. These are interesting statements that can help to explain why and when guarantees from the guarantee bank are needed and whether moral hazard on the part of the banks can occur.

The literature review has demonstrated that collateral can be used to reduce risk for the lender (Berger et al., 2011b; Gonas et al., 2004). According to proposition 2a guarantees from the guarantee bank act as substitute for collateral and, therefore, make loans available to SMEs that could not provide sufficient valuable collateral of their own. In this section, the statements of the interviewees will be analysed to find out why exactly the provision of a guarantee from the guarantee bank facilitates the provision of a loan (part A, question 2). All interviewees referred to the lack of

collateral when being asked about in which cases they insist on the inclusion of a guarantee from the guarantee bank (part A, question 1). As Table 5.3 demonstrates this is something all ten interviewees noted as the main reason for contacting the guarantee bank.

Table 5.3: Impact of guarantees on loan provisions

	Savings banks		Co-operative banks		Private banks		Total	
The guarantee facilitates the provision of a loan as it acts as substitute for collateral	4	100.0%	4	100.0%	2	100.0%	10	100.0%

According to the statements of the interviewees, guarantees from the guarantee bank are required when the firms do not have enough valuable assets to pledge as collateral. When this is the case, the loss given default and, therefore, the expected loss is considered as too high for the bank and partners to share the risk are needed. The importance of collateral to reduce the default risk for the lender becomes again clear in the following statement:

> "The guarantee bank is brought in when the business concept is plausible and all formal requirements for providing the loan are met but not enough collateral is available. So the guarantee reduces the risk for the bank. The aim is to finance liquidity and not risk. Therefore, risk consideration is very important." [I5]

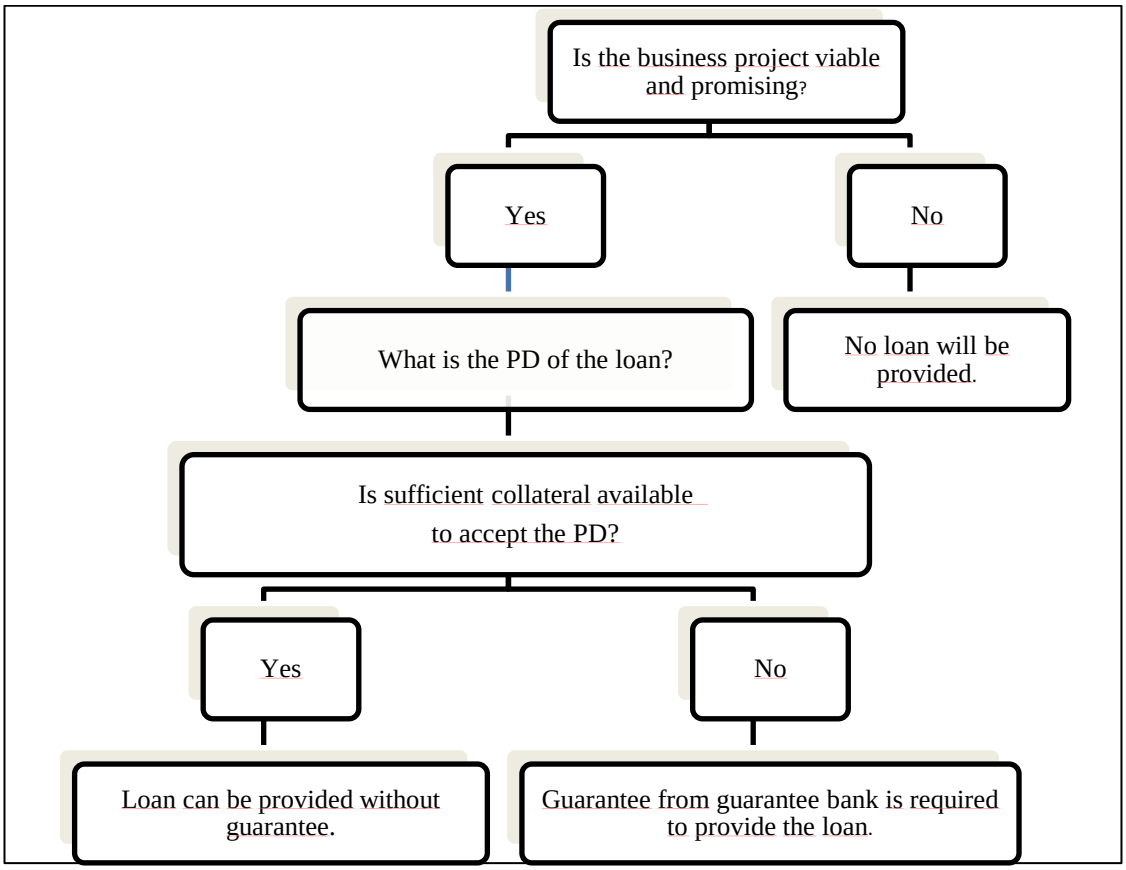
The higher the probability of default is, the higher are the requirements for collateral to reduce the loss given default to an amount that leads to an acceptable expected loss for the bank. This is what the interview partner meant above when he referred to the risk consideration. The significance of the guarantee for reducing the loss given default which otherwise would be too high for the given probability of default is also confirmed by the statement below.

> "Well, we draw on the guarantee bank in those cases in which collateral is insufficient. (…) Apart from that, there are no cases in which we say that we insist on the guarantee. Well, where we can't provide financing otherwise. Normally, it's a question of collateral." [I7]

The statements of the ten interviewees have demonstrated that guarantees from the guarantee bank can be considered as substitutes for collateral. Based on the answers of the interviewees that have been analysed so far, Figure 5.1 has been created which

illustrates the process of deciding whether a guarantee from the guarantee bank is needed for the provision of a loan to a SME or not.

Figure 5.1: Decision making processes



Source: Own illustration

Guarantees from the guarantee bank were mostly included for start-ups. These firms often do not have enough assets to pledge for collateral since business has just started. Moreover, these firms are often related to a higher probability of default (Harhoff and Körting, 1998; Berger and Udell, 1998; Columba et al., 2010). The following statement illustrates the meaning of guarantees from the guarantee bank for start-up financing.

> "We mostly include guarantees for start-ups. When we say, it's a start-up or also the merger of an acquisition of an existing firm where we can only get little collateral... when we see that the firm has no further collateral, our share in blank is too high,… than we include the guarantee bank." [I10]

However, existing firms may also suffer from a lack of sufficient collateral. This is mostly the case when a firm wants or needs to grow, and the existing assets are

already pledged for collateral for older loans. Since the overall risk increases with any additional loan, additional collateral is required to cover that risk.

> "Support from the guarantee bank is also needed when we want to support growth. This means when a firm plans to grow, financing is needed, and the question for collateral and appropriate risk sharing arises. Then we look at how to hedge this. Can the firm manage this out of their own assets or do we have to include a risk partner?" [I8]

The overall amount of risk is always a topic for including a guarantee from the guarantee bank. This is especially the case for smaller banks. Concerning the risk perception of banks, the size of a bank seems to be pivotal. Some savings banks and co-operative banks stated that higher loan amounts are related to higher risk and therefore the loan amount a SME applies for determines how much collateral is required to reduce the risk to a supportable extend.

> "We have always brought in the guarantee bank when the risk was too high for our bank. In fact, too high in terms of our risk-bearing ability. When we get an application for multiple million euro e.g. we check, does this fit to our risk strategy especially against the backdrop of our risk bearing ability? When we see, o.k., which collateral has the applicant, nothing or just a few, than we look for a partner to share the risk. We principally take on the guarantee bank when the collateral is insufficient. (…) Well, we can't provide 30 million euro in blank. The default of such a loan would activate a small earthquake here. For that reason, we look for an additional partner." [I3]

The smaller the bank is the smaller its risk-bearing ability. This is a consequence of the banking supervision law and is demonstrated by the statement of interviewee I6. The balance sheet total of the bank he works for is much lower than the balance sheet total of the other interviewee. As a consequence, the following interviewee referred to a critical loan amount that is much lower than the critical loan amount referred to by interviewee I3 above.

> "Well, we heavily take into account the collateral. (…) We are rather a small bank. For us, 50,000 in blank is an entirely different category than for the bigger banks. And then you indeed search for how to mitigate that somehow." [I6]

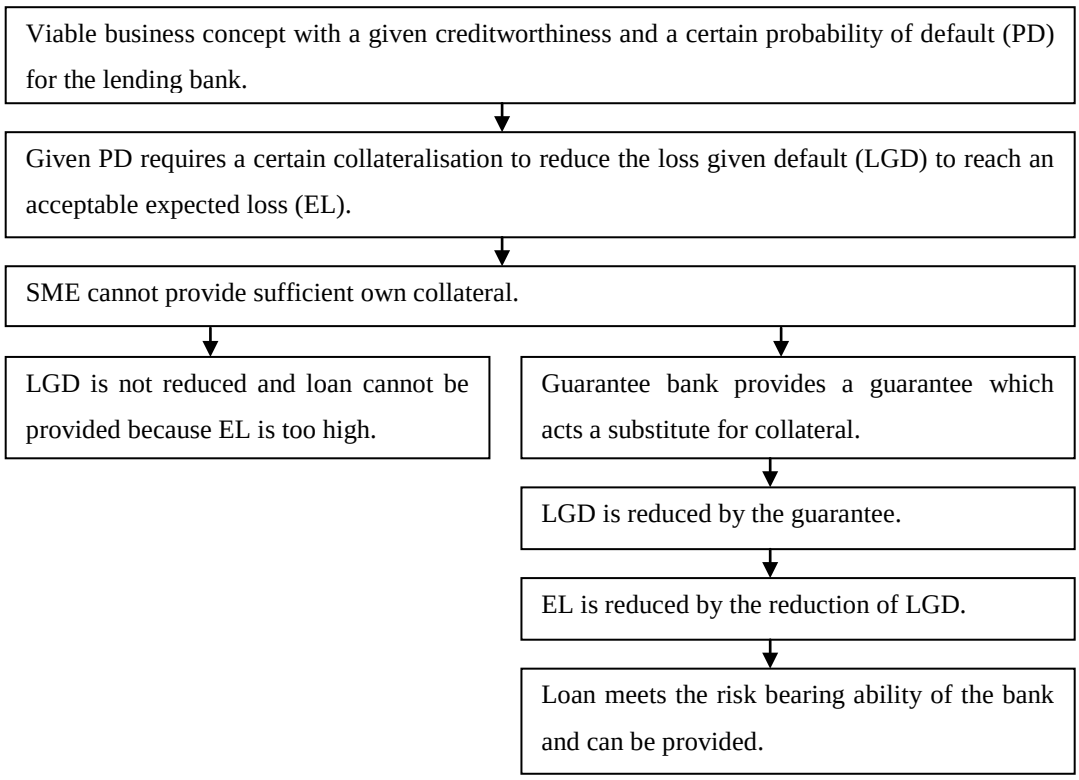
Other banks did not refer to any specific loan amount that is considered to be too high but also referred to the size of the firm that is determining the risk-bearing ability of the bank.

> "We are a relatively small bank, and we don't want to run too high of a risk. This is why we most often involve the guarantee bank. When we say, o.k., that makes sense, that fits, everything is feasible but the collateral doesn't fit. And then we forward this to the guarantee bank." [I10]

The statements cited in this section impressively illustrate that the guarantee bank is a very important partner to reduce the expected loss of a loan. This especially applies to smaller banks. According to the answers of the interviewees it seems not to be such an issue for the private banks or bigger savings banks and co-operative banks.

For an interim conclusion, it can be said that guarantees from the guarantee bank are included when loan applicants show a promising business concept and have a probability of default that is acceptable for the bank under the condition that additional collateral is provided. Without the provision of sufficient valuable collateral, the expected loss would be too high for the given probability of default. The provision of a guarantee from the guarantee bank will reduce the loss given default and, therefore, the expected loss to an acceptable amount for the lending bank and the loan can be provided. These relations are illustrated in Figure 5.2 below.

Figure 5.2: Effect of guarantees from the guarantee bank on SME loans



Source: Own illustration

One could assume that the provision of a guarantee from the guarantee bank could produce moral hazard for the borrower as well as for the banks. If the borrower knows that in case of default the guarantee bank will pay, it might be that a default is not considered to be that bad. Moral hazard on the part of the lending bank might occur when banks accept a higher probability of default when they know that the guarantee bank provides a guarantee (Uesugi et al., 2010). To find out whether moral hazard occurs, the interviewees were asked whether differences of the default rate between loans with guarantee from the guarantee bank and loan without guarantee from the guarantee bank are perceivable (part E, question 19). Five banks stated that they could not estimate this. Obviously, there is no official method to evaluate how loans in default were securitized. Out of the remaining five banks four answered that the default rate is the same whether a guarantee is included or not. The reason for this is that firms always have to pledge private collateral when they want to obtain a guarantee from the guarantee bank. The guarantee bank always requires personal liabilities when providing the guarantee. Therefore, a default will also have a negative impact on the personal financial situation of the firm or the firm owners. This reduces the risk of moral hazard to a minimum on the part of the borrowers. This is demonstrated by the statements below.

> "As a rule, the guarantee bank requires a guarantee of the customer when providing a guarantee. Even for a GmbH *(author's remark: Ltd.)* we had the case where a firm received a guarantee of about 60 per cent of the working capital and the guarantee bank required a personal guarantee of the executive partner. Well, as a rule, the customer is involved anyway. So far, I have not a case where no personal guarantee was required from the owner of the business executive. (…) I can´t say that loans with a guarantee from the guarantee bank are better or worse serviced or more often or less often in default." [I6]

Interview partner I10 also referred to the personal securities borrowers typically have to provide when applying for a guarantee from the guarantee bank. This, indeed, seems to have a positive impact on the repayment behaviour.

> "Loans with a guarantee commonly work well. So far, I have not had a loan in default due to the fact that the customers are always involved personally. Everything they have for security they have provided." [I10]

Interview partner I7 confirmed that the guarantee does not play any role in the default rate.

> "For the default rate, the question of guarantee yes or no is not a topic." [I7]

Another interview partner referred to moral hazard on the part of the banks and the assessment of three parties when a guarantee is provided. First of all, the bank assesses the application. When the business project seems to be viable and the bank believes in the success of the firm but not enough collateral can be pledged, the guarantee bank is asked to provide a guarantee. To decide whether a guarantee can be provided or not, the guarantee bank makes its own assessment. For this assessment, the guarantee bank requires a report of a chamber. In this report, the chamber also assesses the viability and the risk of the project. This demonstrates that three parties have to make an independent assessment about the risk related to a loan and the probability of default. Only if all three parties are convinced of the success of the project, the guarantee and therefore the loan will be provided. According to the quotation below, loan applications are assessed very thoroughly and defaults only occur when the market situation changes. As these changes can happen to any firm, no matter if a guarantee is included or not, there is no difference perceivable between loans with and loans without guarantee.

> "For my cases you can't compare this. Normally, I have assessed it and the chamber and the guarantee bank have also assessed it. Defaults arise when influences from the outside occur. Therefore, one cannot say whether this is more or less. The markets determine this." [I8]

The influence of possible shifts of the marked is not considered by another interviewee who also referred to the different assessments. This person attributes a lower default rate to loans with guarantee due to the three assessments. However, the above statement seems to be more realistic as market changes can have a negative impact on every borrower, and even loans that have been assessed three times can default.

> "The amount of loans in default is lower than for comparable loans without guarantee. This is because of the more intense assessments in the forefront." [I2]

Only five interviewees out of ten made a statement about the default rates of loans that included guarantees from the guarantee bank. The others stated that they could not make a statement about this. This is either an indication of the business client consultants' knowledge about higher default rates that they did not want to reveal or an indication of their lack of knowledge about the default rates. Those that made a

statement indicated that no official statistics are available that differentiate between the collateral pledged for loans that were in default. The interviewees' statements have provided some hint on their acceptance of a higher probability of default when the guarantee bank provides a guarantee. However, no definitive statement about this topic can be made at this point.

Whether the provision of a guarantee from the guarantee bank has an impact on costs and profits of the banks will be analysed in the following section.

5.3 Impact of guarantees on costs and profitability of banks

Since proposition 3a is about the impact of guarantees from the guarantee bank on the profitability of banks, all interviewees were asked about this topic. Part E of the interview guideline contained several questions concerning costs and profitability of banks. The questions were about the impact of the inclusion of a guarantee on the profitability of the loan for the bank (question 15), the meaning of the influence on equity costs (question 16), cross-selling aspects (question 17) and the support of the region (question 18). The cost components that influence the pricing of a firm loan are the market interest rate for the refinancing of the bank, a risk premium, costs for administration, capital costs and a required profit margin.

The answers of the interviewees are highlighted in Table 5.4 below. All questions and the related answers will be discussed in more detail in the following.

Table 5.4: Impact of guarantees on costs and profitability

	Savings banks		Co-operative banks		Private banks		Total	
Loans become more profitable	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Higher effort related to loans with guarantee	4	100.0%	4	100.0%	2	100.0%	10	100.0%
Reduction of equity costs is known	2	50.0%	4	100.0%	2	100.0%	8	80.0%
Reduction of equity costs is not decisive	4	100.0%	4	100.0%	2	100.0%	10	100.0%
Cross-selling is decisive	3	75.0%	2	50.0%	1	50.0%	6	60.0%
Support of the region is important	3	75.0%	2	50.0%	0	0.0%	5	50.0%
Influence on default rate	1	25.0%	0	0.0%	0	0.0%	1	10.0%

The interviewees were asked about the influence of the inclusion of a guarantee from the guarantee bank on the profitability of the loan (part E, question 15). The idea was that the inclusion of a guarantee reduces the risk for the lender and enhances profitability. Existing literature about Credit Guarantee Schemes have revealed some at least theoretical assumptions about how the schemes can enhance the profitability of banks. One was that banks can save costs by transferring the screening and monitoring of the loans to the scheme (Green, 2003).

All ten interviewees indicated that a loan does not become more profitable. They referred to a higher amount of work related to the applications which are completed together with the potential borrower. The commercial bank also forwards the application forms to the guarantee bank. Additional costs also arise from subsequent monitoring and regular reporting to the guarantee bank. This is reflected by the statement below:

> "First of all, we have the work load. The work load is much higher" [I7]

The following statement confirms the higher amount of work and also indicates that profitability is not an issue for including a guarantee from the guarantee bank.

> "Due to the guarantee, the loans do not become more profitable. It is a question of whether one is convinced by the project, not a question of profitability. Anyway, the profitability rather decreases because the amount of work increases." [I1]

Interviewee I6 gave a short description of the additional work that arises. This description illustrates that banks in Germany do not transfer the screening and monitoring to the guarantee bank.

> "It involves a higher work load. One could thrust the application form into the hand of the customer and say: fill out. But this doesn't work. Most of the times, you sit together with him and hold his hand. (…) Especially for public funding we have a higher amount of work for the application and for the monitoring. We have to furnish a usage list, have to prove that the money is exactly used for the purpose stated. Well, this is not only a higher work load with the application. Even when the money is provided, very often the legwork starts for reminding the customer to provide invoices for example. In the overall view, this is a higher amount of work." [I6]

Higher workloads are always related to higher administrative costs. This is confirmed by the following statement:

> "The costs for administration slightly increase because the work load is a bit higher, especially the amount of work for the documentation." [I10]

The statements above demonstrate that the amount of work increases and the administrative costs increase when a guarantee is included. This has a negative impact on the profitability of the loan.

Another issue that was considered was the reduction of capital requirements, as a result of Basel II and Basel III, due to the reduction of the credit risk when including a guarantee from the guarantee bank. All banks were explicitly asked whether the potential reduction of the capital requirements and, therefore, the equity costs is considered when deciding about whether a guarantee should be included or not (part E, question 16). Two interviewees indicated that they do not see the direct impact of the inclusion of guarantee on the costs when calculating the loan. However, the other interviewees stated that they do, indeed, see how the guarantee influences the cost-side of the loan when calculating the loan.

> "I definitively make a pre-calculation. I input the collateral and with a guarantee from a guarantee bank I definitively have another risk which reduces my risk costs and finally reduces my equity costs. (…) I include the guarantee because it is a secure security, not because it reduces the costs of equity. It reduces the interest rate for the customer. The price advantage is passed on to the customer one-to-one. That's why the guarantee does not reduce the costs for the bank." [I3]

When collateral is included in the calculation, the expected loss reduces, according to the intrinsic value of the security. Guarantees of the guarantee bank are considered to be so-called secure securities. This is illustrated by the response of interviewee I8.

> "The equity requirements are not an issue for deciding to include a guarantee. For making the pricing I have to indicate what kind of collateral I have. So I specify this indeed. But the system does not make any difference about whether we have a guarantee or a mortgage for example. Well, there is no distinction between a guarantee and a mortgage. Both are secure securities." [I8]

It seems as if the main point is that secure securities can be provided. According to the standard approach of Basel II, the risk weight (RW) of the collateral taker quantifies the regulated capital. Since guarantee banks can be considered as banks, the RW of a guarantee from the guarantee bank is 20 per cent and therefore requires only 1.6 per cent regulated capital (Brost et al., 2008). This significantly reduces the

costs for tied-up equity. For those SMEs that cannot provide a mortgage, a guarantee of the guarantee bank can act as a substitute.

However, which kind of secure security is provided seems to be secondary since most interviewees stated they do not consider the individual cost components when calculating a loan. In the end it is decisive that the required profit margin is met as demonstrated by the quotation below.

> "This is something I directly see in my calculation when I enter the loan. Well, how the individual costs are constituted. But actually, we rather look at what gets out in the end. What do we earn? How the individual positions, processing costs, risk costs, average costs,… shift, is something we don't pay any attention. We have a fixed guideline for what we want to earn and then it doesn´t make any difference whether it is a loan with or without a guarantee." [I10]

These statements show that, at least for the interviewees, equity requirements or the reduction of equity costs do not play a decisive role when deciding whether a guarantee has to be included or not. The smaller banks especially do not calculate the equity costs for every single loan separately but include a fixed cost component. The main point is the provision of collateral and the reduction of the expected loss. The inclusion of a guarantee, indeed, reduces the expected loss for the lending banks and, therefore, the risk margin. Theoretically, the provision of a guarantee from the guarantee bank can reduce the capital costs. This cost reduction can end up in an increase of the profit for the loan when the previously fixed profit margin is not adopted. However, the answers of the interviewees indicate that when a cost advantage arises by including a guarantee, this is passed on to the SME directly. This means that the decrease of risk and equity costs is passed over one to one by adopting the profit margin. This behavior can be explained by the strong competition in the German banking market. Banks that are limited to a certain region within Germany also have a limited number of existing and potential clients. These banks are stronger engaged in providing services to corporate customers or private persons and less engaged in investment banking (Detzer et al., 2013; Koetter, 2013). Moreover, since German SMEs have more than one house bank (Becker et al., 2013; Hummel, 2011; Hackethal and Gleisner, 2006) they can easily switch to another bank when it provides services to more favourable conditions. Consequently, banks have to struggle for their customers and take advantage of the opportunity to reduce the costs for the customers when a guarantee is provided. The chance to enhance

profitability by demanding a higher margin is not taken as the statements below demonstrate.

> "When I calculate without guarantee and note that I need a margin of two per cent and then include a guarantee and note that I have a margin of only one per cent, I pass the one per cent on to the customer." [I3]

The statement of interviewee I4 again underlines the role of guarantees from the guarantee bank as secure securities and explains why the profitability will not increase.

> "Of course, the risk of the loan reduces enormously due to the guarantee. Well, this is clear. Because we have the creditworthiness of the guarantee bank or the Federal State. But the costs for the bank are by no means reduced. The risk costs decrease but we pass this on one-to-one. Because the customer already pays the 1.5 per cent charge for the guarantee bank. I improve regarding the equity requirements. But since we have a risk-adjusted pricing, we pass this completely on. Otherwise, I would boost the interest rate for the customer to a point that I would say, o.k., then I don't need the guarantee anymore. Well, as a client." [I4]

This statement reveals the reason for passing on the cost advantage. The cost sensitivity of firms and the high competition between banks in Germany requires the adaption. This is also confirmed by the quotation below.

> If we say, o.k., now we have collateral, now we can switch to price range A, B or C, but we demand price range D, then there is always an associated margin. And the margin is higher for a higher price range than for a lower price range. But this is not the rule because we pass this on to the customer. (…) Conceptually, this would be an approach for a bank to generate a higher return. But we don't pursue this approach." [I6]

The results so far indicate that a potential reduction of costs or increase of the profitability is not influencing the decision for or against the inclusion of a guarantee from the guarantee bank. The main point is the reduction of the expected loss as a consequence of the provision of collateral. This is illustrated by the statement interviewee I2 gave when he talked about whether the equity requirements are important:

> "No, definitely not. The firm has to present a convincing business concept. And we want to provide a loan because we believe that the project has a chance in the

> market, has a future. The problem is how to make it because there is no collateral. Then we contact the guarantee bank. That's the only prime mover." [I2]

The provision of the guarantee of course can reduce the risk costs and the capital costs. But this is not explicitly calculated by the banks. Moreover, when calculated, this is passed on to the customer because of the strong competition. The answers of the interviewee, however, revealed some indirect impacts on the profits of the banks that are related to the provision of the loans. By providing additional services to the same customer (cross-selling), additional profits can be generated. The question about the meaning of cross-selling (part E, question 17) was added to the interview guide after the first two interviewees both referred to that topic when asked about profitability. Cross-selling means that besides the initial loan other services will be provided that increase the profit of the lending bank. Interviewee I2 admitted that loans including a guarantee from the guarantee bank may have a profit of zero. However, the bank is willing to provide the loan when additional services can be offered and the overall profit of the customer will become positive.

> "First of all, the margin reduces due to the additional efforts. Therefore, it is an investment in the future. The bank wants to deepen or extend a relationship or start a new relationship. And in the future we can provide additional services and finally have a benefit out of a long-term relationship. Well, first of all we have to invest. Partly with…when we calculate exactly…a profit of zero for the bank. But in the long run it's an investment in the future. Future customers, future firms." [I2]

This is underlined by the quotation of interviewee I5 who also referred to additional services to make the loan profitable.

> "In a second step, the cross-selling potential is also important. If the calculation reveals that additional revenues can be generated besides the costs and the relationship to the customer becomes profitable in a relatively short period of time, the initially higher costs can be accepted. The cross-selling plays in important role since the final decision is made on the basis of the data about the return. If the loan is admittedly supportable by the expected risk, but it would not yield a good return, this would end in the denial of the loan." [I5]

The question below also demonstrates that banks explicitly inform their customers about the intention to provide additional services besides the loan. Moreover, he also mentioned that the loan might be denied when not enough potential for cross-selling can be seen.

> "In the overall view this is an extra effort. For that reason, especially for start-ups, who have a corresponding need for insurances and so forth, we attach great importance to also do this when we provide the loan. This is something we communicate very clearly from the start. And it may be that we deny the loan when we don't come to an agreement on that point." [I6]

Overall, six banks described the cross-selling potential as an important issue when deciding about the inclusion of the guarantee. The other banks answered more generally. According to them, the cross-selling potential is always important but not related to the additional costs for including a guarantee from the guarantee bank.

> "We regularly talk with the customer about his plans for the future, and this naturally includes cross-selling. (…) But I don't calculate which costs I have and which revenues I will most likely have and make my decision in the basis of these information." [I8]

Another interviewee said:

> "We have to do this anyway. This has nothing to do with the guarantee bank that we have to cover additional costs. This is common practice." [I10]

These statements demonstrate that banks always look to solidify a relationship with their customers. When the loan and the potential additional services are considered to not be profitable, the loan would most likely not be provided. Since the inclusion of a guarantee from the guarantee bank rather seems to have a subordinate direct impact on the profit of the banks, cross-selling seems to play an important role in indirectly enhancing the overall revenues. Another point that was mentioned by the interviewees from savings banks and co-operative banks was the central aim of these banks to support the region in which they are located (Hackethal and Schmidt, 2005; Hartmann-Wendels et al., 2007). Section 1.3 has illustrated the special characteristic of savings banks and co-operative banks to have a limited operating area. These banks can only provide services to customers within their respective region. Therefore, the economic vitality of their region is of enormous importance for savings banks and co-operative banks. A question about the meaning of the region (part E, question 18) was also included into the interview guide after the first two interviews were conducted. Five out of the eight savings banks or co-operative banks stated that the support of the region also plays a role when deciding whether or not to provide to loan.

> "We are engaged in that region. We only have that region. We only can be engaged in this region not anywhere else in Germany or the world. Insofar, we depend on giving advice and support to truly interesting start-ups, attractive investments of established businesses. This is always connected to jobs. The employees of these firms are also customers at our bank, have their mortgage here and so on. Well, we only have this region and insofar we are very engaged in that region. We have always been in the lead here regarding guarantee banks and public funding. This is simply the key for the future. Is we spoiled this we would most likely not be where we are today. The inclusion of the guarantee bank is obviously an investment in the future." [I2]

Providing a loan to a firm in the region is always connected to jobs in the region. Since the employees often come from the same region, they might also be customers at the bank. This is also referred to in the next quotation.

> "Our region is out market. Well, it is not as easy for us as for e.g. a high street bank to say we go belly-up. Well, this is difficult for us. Especially for a bigger employer in the region who provides many jobs. The employees are also customers at our bank. This is certainly another strategy then for a private bank that is hundreds of kilometres away. We can only develop in our market here." [I6]

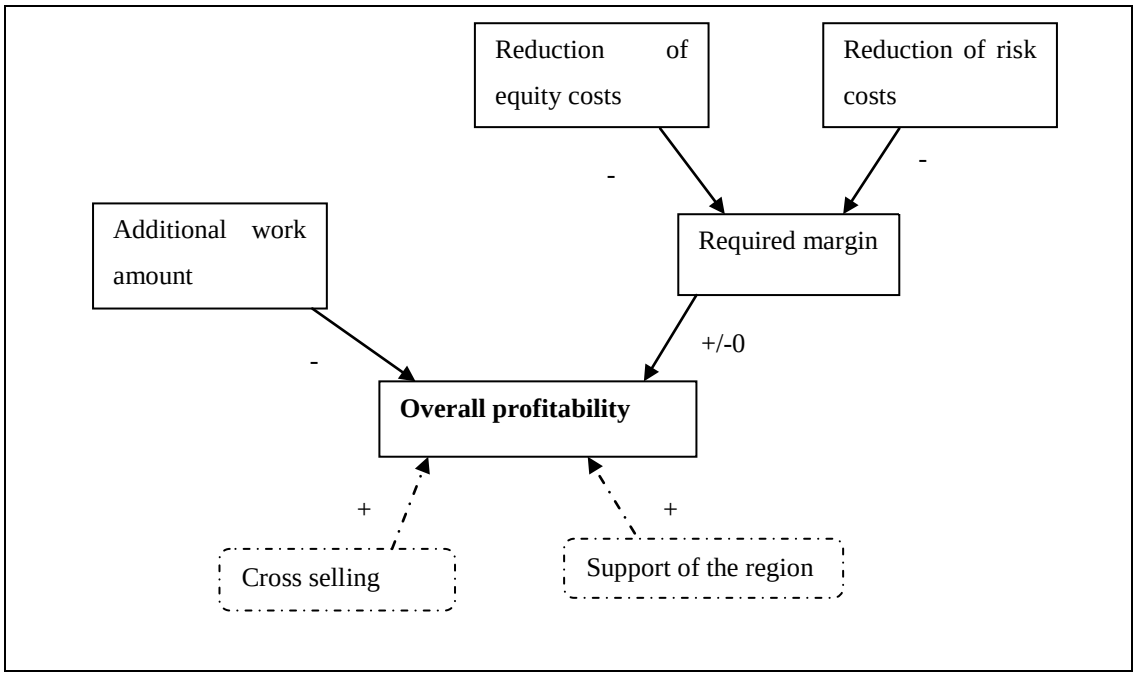
The concentration of one certain region is one of the crucial differences between savings banks or co-operative banks and private banks in Germany. Savings banks and co-operatives to a wider extend consider the welfare of an overall region (Hartmann-Wendels et al., 2007; Hackethal and Schmidt, 2005). For savings banks and co-operative banks, it seems as if much effort is made to make loans available that are considered to be promising and good for the region. Guarantees from the guarantee bank therefore provide a useful instrument to make loans available.

> "Our mission is to support the region and of course we try to pull out all the stops to provide a loan that seems to be reasonable. That can be said without any restrictions. It is not the case that I can further pick out my customers. We simply have a limited number of customers." [I7]

These statements show the reliance of savings banks and co-operative banks on their region. Guarantees from the guarantee bank provide an important means to enable banks to provide loans to SMEs that they otherwise would probably not obtain. Consequently, it is an effective means to support the region and to save the basis for the existence of regional acting banks.

Figure 5.3 has been derived from the interviewees' answers. It shows the impacts on the profitability of SME loans when a guarantee from the guarantee bank is included. Positive impacts on the overall profitability are marked by a '+', negative impacts by a '-'. The broken lines mark indirect impacts on the profit of a SME loan. These impacts are not directly caused by the loan but by external factors.

Figure 5.3: Impacts on the overall profitability of SME loans



Source: Own illustration

As an interim conclusion it can be said that the inclusion of a guarantee has no direct positive impact on the profit of the banks. This is because of the additional amounts of work helping the borrower with the application and monitoring and reporting to the guarantee bank. This all leads to an increase of the loan's administrative costs. By including the guarantee which acts as substitute for collateral, the expected loss for the lender can be reduced. This reduces the risk costs. The provision of a guarantee from the guarantee bank can reduce the capital buffer of the banks and, therefore, reduce capital costs. The answers of the interviewees have shown that the reduction of the capital costs is not decisive for insisting on a guarantee. Regardless, banks stated that they directly pass on the cost advantages to their borrowers when these are calculated. This is most probably caused by the strong competition among the German banks and the cost sensitivity of customers. For making additional profits, cross-selling plays an important role for banks. To increase the overall profit, banks aim for providing additional services like payment transactions or insurances,

for example. If the chance for making additional services is not given, banks will sometimes even deny the provision of a loan including a guarantee from the guarantee bank. Besides the cross-selling potential of the borrower, savings banks and co-operative banks consider the welfare of the overall region when making a loan decision. One of their main targets is the support of their region. As these banks can only act in a certain region, they also consider the impact of a loan denial on the whole region and on their own bank as well. The provision of a loan to a firm can save or create jobs in the region. Since the employees probably come from the same region, they might be customers of the bank who have current accounts, money investments or loans from the bank. This means that the provision of a loan to a firm indirectly might have a positive impact on the profits of other customers as well. The statements of the interviewees have demonstrated that this, indeed, is considered when making a loan decision. In this respect, the inclusion of a guarantee from the guarantee bank might enable the bank to provide the loan in a first place.

5.4 Acquisition of information

In this section the answers of the interviewees about the information obtained from the borrowers are analysed. Since proposition 3b is about the amount and the regularity of information provided by borrowers that received a loan including a guarantee from the guarantee bank, every interview partner was asked whether more or more regular information is received due to the inclusion of the guarantee (part B, question 7 and question 8). The proposition was derived from the theoretical framework. The idea within the theoretical framework was that asymmetric information can be reduced due to the inclusion of a guarantee from the guarantee bank. Since the provision of the guarantee allows providing a loan to SMEs that these otherwise would not have obtained, banks have the opportunity to collect information about the firms and, therefore, might reduce information asymmetries (Craig et al., 2008; Kramer, 2008; Levitsky, 1997a; Vogel and Adams, 1997). This can only be the case when additional information is obtained from the borrower as a consequence of the guarantee. Even though every provision of valuable information reduces information asymmetries, of particular interest is the question of whether the inclusion of the guarantee is especially helpful for overcoming asymmetric information.

The answers of the interviewees are summed up in Table 5.5 below and will be discussed in more detail in the following.

Table 5.5: Assessment of information gathering

	Savings banks		Co-operative banks		Private banks		Total	
More valuable information is received	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Information is received more regularly	2	50.0%	4	100.0%	2	100.0%	8	80.0%

Regarding the amount of information the answers are very conclusive. All ten interviewees generally denied obtaining more information after the inclusion of the guarantee. They mentioned that the bank and the guarantee bank have the same interest in information as demonstrated by the following statement:

> "The guarantee bank does not require any information we do not require as well. Both banks have the same information interest. There is no difference." [I1]

This is confirmed by the citation of interviewee I3 who also referred to the requirements of the guarantee bank.

> "As a rule, we require the same information as the guarantee bank. And I am not under the impression that the guarantee bank bosses us around because it has stronger information requirements…stronger requirements than we have so that we have to contact the firms permanently." [I3]

The assessment of the application and the information that is required is the same independently of whether a guarantee is included or not.

> No. We assess the application very comprehensively and thoroughly. We don´t forward any additional information to the guarantee bank. We assess the application as if we would not include a third party. There is no difference." [I9]

Interviewee I10 confirms the same requirements. She also mentioned that some differences in the information requirements exist based on whether a start-up or an existing customer applied for a loan.

> "Well, I would not say that we get more information. Especially when the guarantee bank is included for a start-up or an acquisition, then we need the information that is also required by the guarantee bank. A CV, budget figures…the information is congruent. It's not more or less information." [I10]

For existing customers, banks might require less information than the guarantee bank. Since the bank already knows the customers and their business, it clearly has an information advantage over the guarantee bank. The guarantee bank in contrast has to understand the business first and needs information about the success and the financial performance of the previous years. As the statement below shows, this is something the bank itself would not require. However, the bank will not obtain more information in these cases even if the guarantee bank needs additional information.

> "Well, it could be that we don't require the same information when we provide the loan alone. This is absolutely possible. Since, in part, we already have the information at our disposal. The same applies for the budget figures or the business plan. I would not ask for them again. But for a new investment, I would ask for them in any case. This is clearly always important for the guarantee bank. They firstly have to understand it completely. Well, we especially have a difference for existing customers. For start-ups, the required information is the same except the assessment of the chamber." [I7]

Concerning the information demand it can be said that banks have fixed requirements for information when assessing a loan application. They all run a credit scoring for every applicant. The extent of information needed is determined by different factors. This is demonstrated by the following statement:

> "The credit scoring is arranged in a staggered manner according to the size of the firm. The smaller the firm, the less detailed are the questions. The bigger the firm, the more detailed are the questions. What is always important is the assessment of the annual report, the profit situation, the cash-flow and the equity. What is also always considered is the account processing." [I2]

Another distinction can be made based on whether it is a start-up or an existing firm.

> "In our rating system we have different segments. Well, start-up have a separate tool because you don't have any historical data. You don't have any balance sheet figures. For these firms you can only decide on the basis of some indicators of the business plan in the end. That means that all the hard facts have only a marginal influence. We stress more on soft facts. (…) Then, we have the normal rating for typical business customers and for large customers we have, based on that rating, some additional and more detailed questions." [I8]

Every interviewee has been asked about their bank's rating tools (part B, question 9) to get a sense of the information that is required to make a loan decision. The

answers show that all banks have different rating tools for different size classes or start-ups and existing customers. The bigger the firm, the more detailed information is required. However, this is not in contrast to the information demanded by the guarantee bank. Therefore, no crucial difference between the required information can be assessed.

The statements so far indicate that banks do not require additional information just because of the inclusion of a guarantee from the guarantee bank. The demand of information is determined by the size or the age of the firm not by the kind of collateral that can be provided. Even if the guarantee bank requires information from the SME that the bank would not require because it is an existing customer, this does not result in additional information for the bank. However, some SMEs said they had provided more information since they received the loan including the guarantee. The reason can be seen in the assessment of the chamber the guarantee bank requires. For making a decision about whether to provide a guarantee or not, the guarantee bank always asks for an assessment from the Chamber of Industry and Commerce or other comparable local organization. The SMEs have to talk to the members of these organisations who also visit the firm to make the assessment. This is something the banks do not require from existing customers. They normally do not even get the reports as the statement below demonstrates.

> "The guarantee bank renders its own opinion by including the local organizations. Such an assessment is not made or required by us. We normally don't even get that report. Anyway, it does not contain any additional valuable information for us. Beyond that, the guarantee bank and we require the same information." [I5]

Consequently, banks cannot generate additional information out of the assessments. This illustrates that the report does not reduce information asymmetries for the banks. Beside the assessment, no additional information or documents are required which the bank does not ask for.

> "Except the report of the Chamber of Industry and Commerce, the guarantee bank does not require any additional documents." [I8]

However, for the SMEs, this is related to a provision of additional information. They have to speak to the members of the visiting organisation and answer many questions. The need for the chamber's assessment from the standpoint of the guarantee bank is explained in the quotation below.

> "What we don't require is the assessment of a local organization. This is something we trust ourselves to do. But this is related to our good knowledge of our region. A guarantee bank provides guarantees to firms within the whole federal state. Insofar, I think that is the reason why they need the report. But beyond that I cannot imagine anything the guarantee bank additionally needs." [I8]

The guarantee bank does not necessarily know the region and its infrastructure and even does not know the customer and its market potential. This is something, the guarantee bank needs to evaluate before a decision can be made. The bank, in contrast, often has this knowledge and, therefore, does not need an additional assessment.

Besides the amount of information provided, another question was whether SMEs provided more regular information to their bank after they received the guarantee from the guarantee bank. The following quotation shows that SMEs have to provide documents in a fixed rhythm which is more or less the same for the guarantee bank.

> "I don't get further additional value of information and the rhythm is also the same. Depending on the creditworthiness we make quarterly business assessments or biannual business assessments. The annual report has to be provided nine month after completion. When the guarantee bank has another rhythm, for whatever reasons, we adopt this. Otherwise we have our rhythm. For the one or other loan we have a monthly rhythm. But this is just for being near the mark in the beginning." [I4]

As the interview partner mentioned, sometimes information has to be provided more regularly. The answers of the other interviewees indicated that this especially applies to new customers or start-ups. Since the bank does not know much about the firm and its business success, information is demanded more regularly to monitor the firm. However, this is independent from the requirements of the guarantee bank and not directly attributable to the inclusion of the guarantee.

> "It is rather the case that the bank requires information more regularly. Especially in the beginning we often demand monthly business assessments whereas the guarantee bank demands quarterly business assessments." [I5]

The reason for insisting on a more regular provision of information might arise from a lack of knowledge about the firm and its business success (Berger and Udell, 1998). However, it might also arise from moral hazard on the part of the banks when they are willing to accept a higher probability of default when a guarantee is

provided (Uesugi et al., 2010). The demand for a more regular provision of information is motivated by the need for up-to-date information for monitoring the development of the firm. Especially for start-up or young firms it is important for the banks to perceive potential irregularities or problems in the early stage. This enables the banks to support the firm in taking countermeasures and trying to prevent a default. For start-ups or young firms, banks have no way to predict their managerial ability (Columba et al., 2010; Craig et al., 2008). When information is required more regularly in the beginning of the relationship this offers the opportunity to the banks to quickly learn about the ability of the firm owners. This is normally not necessary for existing customers as these are known by the banks. This is also highlighted by the following quotation:

> "Well, for start-ups we indeed try to be closer to the customer. Even for smaller loan amounts like up to 100,000 euro maybe, it can happen that we require information quarterly. For an existing customer I would most likely not require information quarterly. For those customers biannually or annually would be sufficient. (…) But I can't see any difference to the guarantee bank." [I6]

While I4 mentioned that it can also happen that the guarantee bank has shorter rhythms, there was only one other interviewee who indicated that the guarantee bank sometimes requires information more regularly.

> "Well, principally it's the same. What is different is that the guarantee bank requires, indeed, quarterly provision of information. Here, we distinguish a little bit according to the size of the engagements. According to § 18 KWG[7], we have to disclose. But this is broadly defined. We have made our own business decision and have established smaller limits. But most of my start-ups are below these limits. This means that they normally are not required to disclose during the year. They only need to present their profit assessment once a year. Well, and for the guarantee bank they, indeed, have to provide it quarterly. That's the reason why it is more." [I8]

The disclosure requirements of the Banking Act were also mentioned by three other interviewees. Because some firms answered on the web survey that they did provide more regular information, all interviewees that denied obtaining more information or more regular information were asked for their thoughts about the firms' conflicting

[7] The KWG is the Banking Act of the Federal Republic of Germany. In § 18 the disclosure requirements are regulated. §18 requires the disclosure of loans of more than 750,000 euro respectively 10 per cent of the liable equity of the bank.

claims (part B, question 8). Five of them had no idea, but three of them referred to the Banking Act.

> "Well, I could imagine that this is because of the scale of the loan. We have §18 and its disclosure requirements. When a customer is below that limit and the bank does not require documents and the customer gets over that limit with the new investments and the bank suddenly requires information. This could be the reason." [I3]

By exceeding the limit for disclosure, SMEs might have to provide more and more regular information than before. This is not due to the inclusion of the guarantee from the guarantee bank. However, the firm has to provide more information. This is also referred to as one possible reason for the answers of the survey respondents by another interview partner.

> "I would explain this to the effect that the overall loan amount exceeds and, therefore, the disclosure requirements automatically increase. Well, this is my estimation. That this has nothing to do with the guarantee bank but with the volume." [I6]

This might be a reason for the answers of the firms who responded to the web survey. One of the other two interviewees explained the answers of the respondent firms with the additional work amount of applying for the guarantee to the guarantee bank.

> "The requirements catalogue of the guarantee bank for applying for a guarantee is enormous. (…) I think, it is due to the application to the guarantee bank." [I4]

The other interviewee could not understand the answers of the respondent firms at first. However, then he explained it by the additional assessment of the chamber. As mentioned before, this, indeed, is related to the provision of more information to the borrower.

> "I can't understand it. Maybe the additional information is required for the assessment of the chamber. This always also involves an inspection of the firm. Considering the figures, banks require more and more information by this time. Business assessments, current confidential information and so on. But I think this is more related to the credit scoring than to the guarantee bank. Maybe this applies for existing customers when these have to provide a CV or target figures. This is something we would not require again." [I10]

In the second part of his statement, the interview partner refers to the guarantee bank's need for more information when a bank's existing customer applies for a guarantee. This has nothing to do with the rhythm of information provided but rather with the amount of information, which has already been discussed above.

This all demonstrates that there are, indeed, reasons why sometimes information is provided more regularly to the bank. However, the central aim was to find out whether information asymmetries can be reduced due to the provision of a guarantee from the guarantee bank. The demand for the provision of information on a more regular manner is not directly related to the inclusion of a guarantee from the guarantee bank but has to do with the need of the bank to learn about a new customer. However, indirectly it is related to the provision of the guarantee. Since the loan would most likely not have been provided without the guarantee, the bank would not have to learn about the firm and require information.

Summing up the results about the acquisition of information and the ability of guarantee banks to reduce asymmetric information for banks, it can be said that banks do not receive additional valuable information about the SMEs due to the inclusion of a guarantee from the guarantee bank. The guarantee bank itself requires more information than needed by the banks since it requires a report from the chambers or local organizations. However, this report is normally not forwarded to the banks. In those cases where a report was forwarded to the banks, the interviewees stated that it did not include any new or valuable information for the borrower. For existing customers, guarantee banks require more information than banks do for assessing the loan application. The banks already know the customers and have had experiences with the dependability of the firm owner and its previous business success. For the guarantee bank, on the contrary, the customer is new and absolutely no information exists about his or her reliability or its past business experiences. It can be said that the higher information requirements of the guarantee bank are supposed to compensate the information disadvantages of the guarantee bank than to reduce information asymmetries of banks. Regarding the rhythm of providing information, the majority of all interviewees denied that the guarantee bank requires information more regularly. Most interviewees even stated that compared to the need of the guarantee bank the bank requires information more often. This is especially true for start-ups or new customers and might be an indication for moral hazard on

the part of the banks. The intention of the banks is to learn about the reliability of the borrower and the managerial abilities very quickly. This, indeed, helps to overcome information asymmetries. However, this is not directly related to the inclusion of the guarantee from the guarantee bank since the information is not needed on behalf of the guarantee bank. However, it can be said that the guarantee bank indeed supports the reduction of information asymmetries by making available the loans in the first place. Without the guarantee, the loans would probably not have been provided. The provision of the loans, however, provides the basis for the collection of information and having experiences with the customers. Therefore, the guarantee bank can be considered as an effective instrument to initiate the reduction of information asymmetries.

5.5 Lending relationships

Based on the theoretical framework derived from the literature review, the collection of information is interrelated with the establishment of a lending relationship (Behr et al., 2011; Cole, 1998). Whether lending relationships can be created or intensified as a consequence of the inclusion of a guarantee from the guarantee bank in a loan should be tested according to proposition 3b: 'The more intense provision of information supports the creation of a bank-borrower relationship'.

The answers about the acquisition of information have shown that the banks do not necessarily receive more information as a direct consequence of the inclusion of a guarantee from the guarantee bank. However, due to the fact that the guarantee provides the basis for the provision of the loan, the banks have the opportunity to provide additional services, to collect additional information and to build confidence in the borrower when he or she proves his or her credibility in the course of the credit period. During the interviews all participants were asked to judge the impact of the inclusion of the guarantee on the establishment or the intensification of lending relationships (part C, question 10 and question 11). All interviewees confirmed a positive impact of the guarantee on the lending relationship which is demonstrated by Table 5.6.

Table 5.6: Impact of guarantees on the lending relationship

	Savings banks		Co-operative banks		Private banks		Total	
The provision of a guarantee has a positive impact on the lending relationship	4	100.0%	4	100.0%	2	100.0%	10	100.0%

Albeit, the main reason for the positive impact is not the creation of more information but the fact that the loan can be provided in the first place.

> "Well, if the loan could not be provided without the guarantee bank, a relationship would not be achieved. And if we can provide the loan because of the guarantee bank, this will go down well with the customer. And this is the cornerstone for a relationship in the first place." [I3]

The central point is the provision of the loan. This is also confirmed by the following statement:

> "The basis for the establishment of a relationship is that we can provide the loan in the first place. That we get the opportunity to reduce the risk for our bank." [I4]

This applies for start-ups or new customers as well as for existing customers who need additional collateral for obtaining a loan. For the former, the provision of the loan including the guarantee provides a chance to establish a new lending relationship, while for the latter it provides the opportunity for intensifying an existing relationship. What is always important for the establishment or the creation of a long-lasting lending relationship is building confidence. Seven out of ten interviewees explicitly referred to the importance of trustworthiness for the lending relationship. This is demonstrated in Table 5.7 in more detail.

Table 5.7: The role of trust in relationship lending

	Savings banks		Co-operative banks		Private banks		Total	
Trust is an important factor for building a relationship	2	50.0%	4	100.0%	1	50.0%	7	70.0%

The role, trust plays for establishing or deepening lending relationships is described in the following statement:

> "If it has to do with new customers or start-ups who would not have got a loan without the guarantee bank, then it *(author´s remark: the provision of a guarantee from a guarantee bank)* pioneers the contact to the customer. And in the course of years, which hopefully do exist, we can acquire positive experiences. The same chance exists for existing customers who plan an expansion investment. We can accompany them, too. We can deepen our relationship and collect additional experiences in the course of the years, deepen our bond of trust. Credit business is always trust. Trust in the person. Obviously, when I know a person for several years then I either have the trust or not, I can assess this appropriately. This is not the case for new customers or start-ups. Insofar, the guarantee bank is clearly the key to realize loans and to develop and deepen a relationship over the course of years." [I2]

Trust is important for the whole lending relationship. It is not the duration of a relationship that creates bonds between a bank and its customers but the question of whether the two parties trust each other. To build trust, information and experience about the borrower are very important.

> "The relation is important, of course. I need to have trust in the person, trust in the entrepreneur, in the products and their abilities to even manage difficult situations. If someone has successfully managed a firma for fifteen or twenty years and then finds himself in a bad situation for whatever reasons one day we as his house bank will never let him fall but accompany him further on. This is out of the question. And insofar it plays a role. Do I know a customer and what experiences have we had so far? When we have a customer who has not the interest of full disclosure, who did not lay it on the line… such a customer will have a rough ride. Insofar, the experiences we have had in the past are an important factor." [I2]

During a lending relationship, borrowers can demonstrate their reliability. This is an enormous advantage when applying for a loan (Zimmermann, 2006; Petersen and Rajan, 1994). The trustworthiness a borrower has signalled, by timely repayment of previous loans, for example, can act as valuable asset for the decision about the provision of a loan. As the statement above shows, this is indeed related to the provision of information. Information is needed to learn about the ability of the entrepreneur to manage his or her business and to learn about the financial situation of the borrowers. This all helps to evaluate the creditworthiness of the borrower which is important for making a loan decision.

> "This is very important as this is the general creditworthiness. I need to have trust in the entrepreneur. At the end of the day, when we make our decision, there always remains some risk for the bank no matter if a guarantee is included or not. And we

> are only willing to bear the risk when we can estimate it. And for this estimation, the economic side as well as the personal side of the entrepreneur is important. And when I have no trust in his ability to be successful, I can't provide the loan." [I9]

As the answers of the interviewees show, trust is important for providing loans. Customers can build trust by repaying back loans but also by providing all information necessary and in time to the bank. This is also demonstrated in the following statement:

> "I know how successful the customer was in the past and how he manages his firm. Partly, we also know his clients. This provides us with a very comprehensive picture. We need to get an impression of his financial circumstances. This has much more validity when we have obtained this information for a long time. Assume someone with a new concept or a new market applied for a loan. Then, I may not have the impression that this could be a good thing. Or I get into it but do not really have a feeling for it. This is much easier with an existing customer. There, we have a lot of information. And information creates trust." [I7]

All the statements above have demonstrated the importance of a trustful relationship for a positive credit decision. For new customers or start-ups, the provision of a guarantee from the guarantee bank builds the basis for the creation of a lending relationship. To get the chance to build a trusting relationship, the underlying circumstances play a crucial role. This means that the bank can prove its expertise and provide the services that are desired by the customer, as seen in the following statement.

> "It is definitely a chance when we make the loan possible thanks to the guarantee bank. Yes, indeed, it certainly is. Without the guarantee bank such relationships could not be achieved. If you give the customer the opportunity to get to know the bank and if we present our bank as we aspire to, then a relationship of trust can start out of this in a relatively early phase. Yes, this is a very good way to begin a relationship." [I9]

Four of the ten interviewees mentioned that the creation or the deepening of a lending relationship is not a fast-selling item. Besides the basic provision of the loan, it is important that the clearing and settlement goes off without any problems and the customer is content with the bank and finds the bank cooperative and pleasant. Moreover, the bank gets the opportunity to provide additional services to the customer. These are key factors for establishing a long-lasting relationship.

> "We could provide the loan only because the guarantee bank substituted collateral and, therefore, reduced the risk. The fact that the bank could consequently realize the loan can have a positive impact on customer loyalty and gratitude. Important for that is that we as bank work well. That following services like the payment transactions are processed without any problems and the customer appreciates the collaboration with the bank. In those cases, long-time lending relationships can be established by the door opener guarantee bank." [I5]

The statement illustrates that lending relationships are characterized by reciprocity. Both the bank and the customer have to prove themselves to be trustworthy and reliable partners. Only then can long-lasting lending relationships be generated.

> "Well, I really think that is like this. When we include the guarantee bank and everything is positive, the customer is very confident for the following years and committed himself to the house. And the contract would not have been happened without the guarantee bank. (…) Accordingly, one has to admit that, especially for start-ups and business takeovers, when the guarantee bank is included and everything goes well, the customer is very thankful and most often a long-lasting relationship can be established." [I10]

The guarantee from the guarantee bank is the door opener. Since the inclusion of the guarantee enables the provision of the loan in the first place, most borrowers are very thankful at that stage. This also provides a good basis for cross-selling. When everything goes well in the following month or years, a trustful relationship can be established as demonstrated by the quotation below:

> "When we as a bank provide access to the loan for a customer in that package, he will appreciate this for a whole lifetime as long as nothing goes wrong. Insofar, the guarantee bank makes a major contribution when a guarantee is provided and the provision of the loan is made possible. And then, we get access to the customer. Definitely." [I3]

For summing up the answers about the relation between the provision of a guarantee from the guarantee bank and the creation or deepening of lending relationships, it can be said that the provision of a guarantee acts as a cornerstone for the establishment of a bank-borrower relationship. The loan would not have been provided without the guarantee. When the guarantee and, therefore, the loan are provided, the bank has the opportunity to make its own relationship with the borrower. It can collect information about the managerial experiences of the business owner and the success of the business project. Information is always needed to learn about the borrower.

Insofar, the statements of the interviewees have demonstrated that information is, indeed, important for the establishment or deepening of a lending relationship. Most of them referred to the importance of trust in this context. A stable and long-lasting lending relationship can only exist when the borrower provides valuable information to the bank which enables the bank to assess current situation and the potential success of the borrower. The creation and adherence of a trustful relationship is not only in the hands of the borrower. The bank for its part has to work well and has to provide its services to the satisfaction of the borrower. When the borrower is confident he or she will probably also be willing to provide all necessary information in return. This is what constitutes a trusting lending relationship. Trust in the reliability of the borrower can also reduce the risk of moral hazard on the part of the borrower. When banks know their customers for a long time and borrowers have proved to be reliable and honest, the risk of shifting to more risky projects after receiving the loans seems to be rather small. Moreover, a steady exchange of information which defines a good lending relationship would result in the detection of the moral hazard. Thus, the provision of the guarantee from the guarantee bank builds the basis for a trustworthy relationship. But it is up to the behaviour of the bank and the borrower to let the relationship grow.

5.6 Mitigation of credit restrictions

Finally, it shall be assessed whether guarantee banks help to overcome credit restrictions for SMEs (proposition 4). To evaluate this, the interviewees were asked whether credit restrictions can be mitigated by the instrument guarantee bank (part D, question 13). Eight of them gave an assessment. The others stated not being able to assess this. As Table 5.8 shows, they all confirmed the ability of the guarantee bank to mitigate credit restrictions for SMEs.

Table 5.8: Ability of the guarantee bank to mitigate credit restrictions

	Savings banks		Co-operative banks		Private banks		Total	
Due to the guarantee bank credit restrictions can be mitigated.	2	50.0%	4	100.0%	2	100.0%	8	80.0%

They all argued that some loans indeed would not have been provided without the guarantee bank.

> "The guarantee bank opens the door to customers that one otherwise could not have opened. The guarantee bank gives an opportunity to customers, to purposes, to firms, to obtain a loan, to establish or deepen a business contact that otherwise would not have been possible. And it opens the door for making profit in the future." [I2]

While the interviewee above referred to the additional profit that can be generated in the course of the credit period and the succeeding customer relationship, another interview partner mentioned the jobs that can be created or saved due to the provision of the loan. This underlines the overall importance of the guarantee bank to support firms and a whole region as already discussed in Section 5.3.

> "If the guarantee bank did not exist, many loans would not have been provided and, therefore, many jobs would not have been generated. And I think it is worth fighting for every job. Especially for us as a medium-sized bank, the guarantee bank is an important instrument." [I3]

The guarantee bank is considered to be an important instrument to foster the provision of loans to SMEs. The interviewees indeed mentioned concrete cases in which the guarantee bank was crucial for providing the loan.

> "Well, I, indeed, recall some examples where it was on a knife edge, and we could rescue the firm with the help of the guarantee bank." [I6]

This is also confirmed by the following statement:

> "In those cases in which it is not possible otherwise, it is a very beneficent instrument. And this absolutely should be fostered further on. (…) It is one possibility to make loans just available. It is a very useful instrument." [I7]

However, the statements also underline the assumption that the provision of guarantees by the guarantee bank leads to a provision of loans that are related to a higher default risk. That the guarantee bank enables the provision of loans in the first place is again demonstrated by the statement below.

> "I am very glad about the existence of the guarantee bank because there are some loans that we could not have provided without the guarantee bank." [I10]

How decisive the inclusion of the guarantee is for providing the loan can be deduced from the answers of the interviewees about the consequences of a negative decision of the guarantee bank. The interviewees were asked whether a loan would have been

provided anyway and under which circumstances (part A, question 4). All interviewees answered that the loans will not be provided as the following quotation demonstrates.

> "That depends. I would say that we most likely will not provide the loan. That ought to be such an awesome and promising concept that we would take the risk consciously. But as a rule, when we have decided to provide the loan when a guarantee is provided and the guarantee will not be provided,…then there must be a reason for the denial. And then we have to ask ourselves why the guarantee bank does not provide the guarantee. Well, for us, this is an evidence for not providing the loan then." [I6]

This shows that the assessment of the guarantee bank, indeed, serves as some kind of reassurance for the bank. When the guarantee bank does not provide the guarantee, the expected loss is too high for the bank, and the loan will most likely not be provided. This is again an indication for the willingness of banks to accept higher probabilities of default when the guarantee bank provides a guarantee. For a given probability of default, the provision of the guarantee reduces the expected loss for the bank. When no guarantee is provided, the expected loss is not reduced. This ends up in an overall default risk that is too high for the bank.

Regarding the refusals of the guarantee bank, the answers have revealed that the guarantee bank rarely or never rejects an application. This is demonstrated by the following statement:

> "Should the guarantee bank reject the provision of the guarantee, we will not provide the loan. But this has never happened so far." [I5]

This is also confirmed by the following statement:

> "Fortunately, a rejection of the guarantee bank is very rare. I have checked that for the last two years. During this time we've had no rejection. Basically, we agree upon the collateralisation with the customer in advance. And it is important for us that we reach this collateralisation. If we don't achieve that, we will have to reject the loan." [I9]

The low number of refusals by the guarantee bank is related to the intensive assessment of the loan application of the bank. Only if the bank believes in the success of the concept it will apply for a guarantee. This has already been discussed in Section 5.1 and is underlined by the following citation:

> "So far, I have not had a rejection. They have backed everything so far. But this is something you can judge from the beginning on. When we as a bank see, that the whole project makes no sense we will not send an application to the guarantee bank. Well, we, indeed, prove whether the application makes sense or not." [I10]

Moreover, the contact between the guarantee bank and the banks seems to be very close. The following statement illustrates the relation between the close cooperation and the low rate of rejection.

> "So far, I haven't had the case where the guarantee bank has rejected a guarantee. I work very closely with the colleague from the guarantee bank. Everything that could be critical is discussed in advance on the phone. I do this because I think it makes no sense for the customer to pay money for the application when the guarantee bank is not generally interested." [I8]

The close relationship between the guarantee bank and the banks is certainly one central key for the success of the instrument. Only when the collaboration is perceived as being uncomplicated and pleasant will banks get in contact with the guarantee bank to include a guarantee. The answers of the interviewees demonstrated that many questions can be cleared up in a straightforward manner through official channels. This facilitates the decision of the banks to ask for a guarantee from the guarantee bank when they have a loan for a promising business project but not enough valuable collateral.

Another question that arises is whether credit restrictions can be mitigated sustainably due to the guarantee bank. The idea behind this is that a SME that needs a guarantee for an initial loan gets the opportunity to provide information and establish a lending relationship with the bank (Craig et al., 2008; Green, 2003). In this way, asymmetric information can be reduced. As a result, it does not need a guarantee again when applying for another loan later on (Vogel and Adams, 1997). Asked about this (part D, question 14), all ten interviewees denied such a relationship. When a SME applies for a follow-up loan, the banks assess the business project and the creditworthiness of the firm again. Only when a firm has developed successfully, sufficient collateral can be provided and the default risk is acceptable for the bank can the loan be provided without the inclusion of a guarantee from the guarantee bank. However, this is not dependent on the former provision of the guarantee or the relationship that has been established as the following quotation demonstrates.

> "If the collateral or the assets e.g. due to the growth or the necessary investments, do not grow in an equal ratio, it can by all means be that a guarantee is again needed, especially when innovations or new products have to be developed. This takes time. In these cases it is a conventional practice to include the guarantee bank again." [I2]

This is underlined by the other interviewees that also referred to the importance of the current situation of the firm as being decisive for the decision.

> "The profitability of the customer is always decisive. For every follow-up application we again make a new credit scoring. And when the customer can demonstrate a good profitability and has enough valuable collateral, then a loan can be provided without a guarantee from the guarantee bank." [I5]

The financial and economic situation and, therefore, the creditworthiness of the firm need to have changed since the initial loan had been provided. When the borrower shows the same probability of default then at the time of the initial loan application, the expected loss will again be considered as being too high. When this is the case, a guarantee from the guarantee bank will again be needed to reduce the expected loss and, therefore, the default risk for the bank to an acceptable level. This is illustrated by the following statement:

> "We can only abandon a guarantee when the economic situation has ameliorated in such a way that totally different financial qualities can be presented and collateral has been built up that we now can consult. If the situation is equal to the situation at the time of the first application, we would include a guarantee again." [I7]

Thus, it is absolutely unimportant whether a guarantee from the guarantee bank was included in the initial loan or not. The starting situation is the same. The bank assesses the business project and the probability of success of the planned investment. When the concept seems to be promising, the risk for the bank and the collateral that can be provided to reduce the expected loss are assessed. When the borrower cannot provide enough valuable collateral to reduce the risk to an acceptable amount according to the risk bearing ability of the bank, a guarantee from the guarantee bank will be required again to provide the loan.

> "The decision is independent of the initial guarantee. We have to assess what is the customer planning and how can I best finance this. How can I best finance this under the aspects of risk and profitability?" [I8]

The answers indicate that information that can be collected and relationships that can be established since the provision of the initial loan including a guarantee are not determining the decision of whether to include a guarantee again or not. It is rather a question of collateral, the financial or economic situation respectably the creditworthiness and the expected loss at the current state.

Summing up the interviewee responses, it can be said that guarantees from the guarantee bank, indeed, help to mitigate credit restrictions for SMEs. The guarantees act as substitute for collateral and allow loans to SMEs that they would otherwise not have obtained. Without the loan, businesses could not have been founded or continued and jobs could not have been generated or saved. Therefore, banks consider the guarantee bank to be an efficient instrument to support SME financing. The answers of the interviewee have underlined the high importance of the guarantee bank for SME loans. They stated that those loans that include a guarantee would most likely not have been provided if the guarantee bank had rejected the provision of the guarantee. Without the guarantee the expected loss and, therefore, the default risk for the lender would have been perceived as too high. However, related to a very close and unproblematic cooperation between the guarantee bank and the banks, applications for a guarantee are rarely or never refused. This is related to the thorough assessment of the loan application by the bank in the forefront. Only when a concept seems to be promising is the application for the guarantee submitted. Moreover, banks often discuss the loan application with the guarantee bank before they apply for the guarantee. This helps to answer questions and assess the probability of success of the application. Only when an application seems to be promising will it be forwarded to the guarantee bank.

The provision of a guarantee from the guarantee bank for an initial loan has no impact on the provision of a follow-up loan. For every loan application, the banks assess the concept and the financial and economic situation of the firm. When a concept seems to be promising, the creditworthiness has increased and enough collateral is available to reduce the default risk to an amount that is consistent with the risk-bearing ability of the bank, the loan can be provided without the need for a guarantee from the guarantee bank. If the business project may be promising but the borrower’s creditworthiness has not increased, a guarantee from the guarantee bank will again be needed. Therefore, it cannot be said that the provision of a guarantee

from the guarantee bank mitigates credit restrictions in a sustainable way for SMEs. This is always dependent on the business project, the current situation of the firm and its ability to pledge assets for collateral.

6 Merging survey and interview results

This section is about the implications of the survey and interview results for the propositions and research questions. To allow comparison, the quantitative and qualitative findings were merged (Creswell and Plano Clark, 2007; Plano Clark et al., 2010). In Sections 4 and 5 above, the two data sets have been analysed separately, according to the order of the research questions and respective propositions. The results of each data set are briefly presented in Table 6.1. The table contains the research questions as well as the corresponding propositions and the associated quantitative and qualitative results.

Table 6.1: Results of the quantitative and qualitative analyses

Research Question	**Propositions**	**Results web survey**	**Results semi-structured interviews**
For what reasons and in which situations are guarantees from the guarantee bank important for the provision of loans to SMEs?	P1: SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral.	Difficulties in obtaining bank loans can be confirmed (Sections 4.2).	SMEs without viable business projects have problems in obtaining bank loans (Section 5.1).
		No clear differences between the demographic variables associated with higher default risk and the access to finance can be found (Section 4.2).	No general exclusions for e.g. certain industrial sectors exist (Section 5.1).
	P2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan.	The enormous importance of guarantees from guarantee banks for SMEs can be confirmed (Section 4.3).	Guarantees from the guarantee bank act as substitute for collateral and reduce the default risk for the lenders. This enables banks to provide loans to SMEs that these otherwise could not provide (Section 5.2).
		A significant relationship to the size of the firms has been found (Section 4.3).	
	P2b: Including a guarantee from a guarantee bank makes SME loans more profitable for banks.	-	Guarantees rather reduce the profit for the lender because of increasing processing costs. The reduction of capital costs and risk costs is passed on to the customers and therefore has no impact on the profitability. The overall profitability can be increased by indirect impacts like cross-selling effects and the support of the region (Section 5.3).

Table 6.1 (continued)

Research Question	Propositions	Results web survey	Results semi-structured interviews
Can the provision of a guarantee from a guarantee bank help to reduce information asymmetries between the lending bank and the borrower?	P3a: SMEs provide more information and more regular information to their bank as a consequence of obtaining the guarantee from the guarantee bank.	SMEs tend to provide information more regularly but not necessarily more information (Section 4.4).	SMEs may provide more information for the assessment required by the guarantee bank. However, the information is not valuable for the banks (Section 5.4).
		Significant relationships between demographic factors and the provision of information were found (Section 4.4).	A more regular provision of information is possible but is not necessarily a consequence of the inclusion of the guarantee (Section 5.4).
Has a new lending relationship been created due to the loan with guarantee?	P3b: Increased information supports the creation of a bank-borrower relationship.	The majority of all SMEs denied that the relationship has intensified (Sections 4.5).	The fact that the loan can be provided in the first place makes the creation of lending relationships possible (Section 5.5).
		Significant relationship between information and lending relationship was found (Section 4.5).	
Do German guarantee banks help to overcome credit restrictions for SMEs?	P4: Guarantee banks help to mitigate credit restrictions for SMEs.	No concluding assessment possible, due to the small number of firms that did not need a follow-up guarantee (Sections 4.6).	The guarantee bank indeed helps to overcome credit restrictions by making available loans to SMEs in the first place. However, it does not help to sustainably overcome credit restrictions (Section 5.6).

Source: Own illustration

The table facilitates the direct comparison of the results. It becomes visible whether the results of the two different data sets are similar or different from each other. Except proposition 2b, all other propositions have been analysed using data from the web survey and the semi-structured interviews. These results have to be merged to provide a complete picture of the opinions and experiences of SMEs as well as of commercial banks. Since both data sets are considered to be equally important within the present research, it was decided to not follow a predetermined order for comparing the results. The comparison of the results follows the order of the research questions. Section 6.1 contains the merged results about the driving forces of including a guarantee from the guarantee bank. Section 6.2 combines the results about the amount and frequency of providing information since a loan with guarantee from the guarantee bank was provided. The quantitative and qualitative results about

the impact of the relationship between the borrowers and the banks are merged in Section 6.3. Finally, Section 6.4 combines the results about the ability of the guarantee bank to mitigate credit restrictions of SMEs.

6.1 Driving forces for the inclusion of guarantees

The first research question is about the reasons and situations in which the provision of a guarantee from the guarantee bank becomes necessary. To evaluate the reasons commercial banks insist on the provision of a guarantee from the guarantee bank, three different topics derived from the framework have been investigated: difficulties in obtaining bank loans for SMEs, the role of collateral and risk, and the profitability of SME loans for banks. According to these topics, three propositions have been built.

Starting with proposition 1, “SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral”, the central aim was to determine whether and why some SMEs have difficulties in receiving bank loans. The answers of the respondent SMEs have demonstrated that difficulties indeed exist (Part I, Q 1: mean value 3.68, standard deviation 1.020). No significant relationship has been found from analysing the relationship between the presence of difficulties and demographic factors that are widely associated with higher default risks like age, size, industrial sector and legal form. These results are consistent with the findings of the KfW-medium sized panel 2011 (Reize, 2011) which exclusively analysed the link between demographic factors and loan availability for SMEs and also found no relationships. Moreover, the findings are consistent with the interview results. All interviewees were asked to specify the general exclusions that exist for SME loans (part A, question 5). Nine of them (90.0%) denied the existence of general exclusions. According to these answers, the demographic factors are not decisive for accepting a loan. However, the answers of the interviewees demonstrated that the business project is a decisive factor when deciding about the provision of a loan. If a business concept is not convincing and the bank does not believe in the future success of the firm, a loan will not be provided. These results demonstrate that at least the first part of proposition 1 can be confirmed at this stage. The present research findings have confirmed that some SMEs have difficulties in obtaining bank loans. This is consistent with the results of the annual surveys of enterprises

conducted by the KfW (Bauer and Zimmermann, 2010; Schwarz and Zimmermann, 2012; Zimmermann and Steinbach, 2011). Additionally, the semi-structured interviews revealed a reason for loan denials of commercial banks which is independent from the demographic factors. The answers of the interviewees have demonstrated that restricted access to bank loans for SMEs often arises from weaknesses of the presented business projects. SMEs with weak business projects will not receive a loan independent of whether the guarantee bank will provide a guarantee or not. In this respect, the interviews provided another reason for credit restrictions for SMEs which has not been recognized by the above cited surveys.

The role of collateral for the provision of a bank loan is considered in proposition 2a: "Providing a guarantee acts as substitute for collateral and allows SMEs to receive a bank loan". This proposition examines why commercial banks insist on the provision of a guarantee from the guarantee bank. Proposition 2a implies that the main role of the guarantee bank is to provide additional collateral. This assumes that the expected loss would otherwise be too high for the commercial bank. In such a situation, the provision of a guarantee from the guarantee bank means additional collateral for the bank. This reduces the expected loss and the loan can be provided (Daldrup, 2005). To evaluate this, the bank managers were asked about the role guarantees from the guarantee bank play in providing loans to SMEs (part A, question 2). All of them (100%) stated that guarantees from the guarantee bank are required when the potential borrowers cannot pledge enough valuable collateral. In these cases, guarantees act as substitutes for collateral and the answers of the interviewees confirmed proposition 2a and the findings of existing literature about that topic (Menkhoff et al., 2012; Berger et al., 2011b). The answers have also confirmed the importance of collateral for SME access to bank loans and are in line with existing literature (Schmidt and van Elkan, 2006; Stefanovic, 2009). Additionally, the answers of the interviewees have revealed another interesting point: the relationship between the size of a bank and the collateral requirements. The answers have demonstrated that the size of a bank is related to the risk-bearing ability of the bank. According to the answers of the interviewees, the risk-bearing ability is positively correlated to the size of a bank. Consequently, smaller banks have a lower risk-bearing ability. A lower risk-bearing ability often leads to a higher requirement concerning the value of collateral even for smaller loan amounts. Due to the provision of a guarantee from the guarantee bank, the banks attain a security that

reduces the expected loss to an acceptable amount, and the loans can be provided. The situation that not enough own collateral can be provided can arise for both, start-ups and existing SMEs. Start-ups often just have not enough valuable assets to pledge since they are in the beginning of their business. For existing firms, collateral is often already pledged for other loans. If an additional loan is needed for financing growth, for example, additional collateral will be needed. This is when guarantees from the guarantee bank can be helpful for obtaining bank loans.

These statements might provide a first indication for the acceptance of higher probabilities of default when a guarantee from the guarantee bank is provided and, therefore, the risk of moral hazard on the part of the lending banks. The provision of a guarantee from a guarantee bank lowers the inherent risk of a loan to an acceptable level for the bank. Without the guarantee, the risk would be considered too high and the loan could not be provided. The provision of a guarantee, therefore, might result in the acceptance of higher basic risks of a borrower (Uesugi et al., 2010; Levitsky, 1993). To further analyse the occurrence of moral hazard, the interviewees were asked about the default rates of loans for which a guarantee from the guarantee bank was obtained. A higher default rate could be a signal for moral hazard related to the provision of the guarantee from the guarantee bank. All interviewees have been asked to compare the default rate of loans including a guarantee with loans without a guarantee (part E, question 19). Not all of them felt able to estimate this. Out of those that answered (50.0%), the majority (80.0%) denied any difference between the two groups. Since the guarantee bank always also requires personal collateral from the borrowers, a default of the loan would also have personal consequences for them. This is considered to reduce at least the risk for the occurrence of moral hazard on the part of the borrower as discussed in the literature review (Uesugi et al., 2010; Stiglitz and Weiss, 1981). However, the existence of moral hazard could neither be excluded nor confirmed; further research about this topic is needed.

The great importance of guarantees from the guarantee bank for obtaining bank loans is confirmed by the responses to the web survey. Overall 86.0% of all respondent SMEs indicated that they absolutely agree or rather agree to the statement that the guarantee from the guarantee bank was crucial for obtaining the loan (Part II, Q 3e). The only statistically significant relationship was found between the significance of a guarantee and the size of a firm. However, the judgement of the firms about the

significance of guarantees from the guarantee bank for obtaining loans and the answers of the interviewees lead to the conclusion that proposition 2a can be confirmed. A guarantee from the guarantee bank provides additional collateral to the banks which reduces the expected loss and is crucial for a positive loan decision.

The last driving force for the inclusion of guarantees from the guarantee bank in SME loans that has been analysed is the impact on the profitability for the lending banks. One reason that is often mentioned for credit restrictions of SMEs is high costs related to relatively small loan amounts SMEs often apply for (Beck et al., 2010; Bosse, 2009; Riding et al., 2007). In the literature, Credit Guarantee Schemes are considered to be an effective means to reduce these costs for the lending banks (Green, 2003; Levitsky, 1997a). Proposition 2b tests the impact of guarantees on the overall profitability of SME loans: “Including a guarantee from the guarantee bank makes SME loans more profitable for banks”. Information about the profitability of banks can only be answered by commercial banks themselves and not by the SMEs. Therefore, profitability was a topic of the semi-structured interviews. The interviewees’ answers have demonstrated that the direct impact of guarantees for SME loans on the banks’ profit is rather negative. The inclusion of a guarantee from the guarantee bank increases the amount of work for the initial application as well as for ongoing monitoring and reporting. This was stated by all ten interviewees (part E, question 15: 100.0%). These results conflict with the conceptual literature of Green (2006) and Levitsky (1997a). Since the guarantee bank is backed up by counter guarantees of the federal states and the federal government, guarantees from guarantee banks are considered as being secure securities (Schmidt and van Elkan, 2006). The inclusion of such a guarantee reduces the equity requirements according to Basel II and later Basel III. This reduces the capital costs for the banks. The provision of additional collateral also reduces the expected loss for the lending banks and, therefore, the risk costs. However, all ten interviewees denied that the costs are a decisive factor for requiring the guarantee (part E, question 16: 100.0%). The reduction of capital costs and risk costs has a direct impact on the pricing of the loan. It reduces the required margin of the bank. However, the German banking sector is highly competitive. Regional banks have only a limited number of customers and are less engaged in investment banking than private banks. Consequently, providing services to corporate clients and private customers is of great importance (Koetter, 2013; Detzer et al., 2013). Due to the limited number of potential customers and the

fact that German SMEs can chose between services of more than one house bank (Hummel, 2011; Hackethal and Gleisner, 2006), banks do not take the opportunity to enhance the overall profitability of a loan. The interviewees stated that due to the high cost sensitivity and the market competition the cost advantage is fully passed on to the borrower. Therefore, the reduction of costs does not increase the bank's profitability; therefore, proposition 2b cannot be confirmed by the present research. Regarding the options for indirectly increasing profitability, six interviewees mentioned that the cross-selling potential plays an important role (part E, question 17: 60.0%). When additional services can be provided, this opens up the possibility for enhancing the long-term profit potential of a customer. A lack of cross-selling potential might lead to a denial of a loan even if the guarantee bank agrees to provide a guarantee. Cross-selling has not been considered in the reviewed literature and provided a new area for evaluating the profitability of loans including a guarantee from a guarantee bank. Another indirect impact on the profitability was mentioned by all three interviewees from savings banks and two out of three interviewees from co-operative banks (part E, question 18: 50.0%). This was the support of the region. Savings banks and co-operative banks are limited to act in a certain region. When the inclusion of a guarantee from the guarantee bank enables the provision of a loan to a SME, this provides an opportunity to support a firm in the region and to save or create jobs. When the lending bank also provides current accounts, money investments or loans to the employees of the supported firms, the overall profit of the bank can be positively influenced. This can be considered as an indirect consequence of the provision of the loan. It also has an indirect impact on the bank's profitability. This was also not mentioned in the reviewed literature about guarantee banks or Credit Guarantee Schemes. However, it offers another incidence for the occurrence of moral hazard on the part of the lending banks. To ensure the economic vitality of their region, savings banks and co-operative banks might accept higher probabilities of default when the guarantee bank reduces the expected loss. The role of cross-selling and the support of the region as well as the impact on moral hazard on the side of the banks have not been analysed in detail in the present research and provide promising areas for further investigation. Summing up, proposition 2b can only be confirmed with restrictions. The results have demonstrated that direct increases of the bank's profitability are hardly achieved by the inclusion of a guarantee. This is caused by the higher amount of work for the banks which is related to the application

for the guarantee and the monitoring and the reporting to the guarantee bank. However, commercial banks, indeed, consider additional services that can be provided. This offers potential for cross-selling and, therefore, for additional profits. These profits are indirectly relatable to the inclusion of a guarantee. This is the case when the loan would not have been provided without a guarantee from the guarantee bank. In such a situation, the additional services would not have been provided as well. Another indirect impact of the overall profitability of a bank can arise out of the limitation of savings banks and co-operative banks to a certain region. However, this can also lead to moral hazard on the side of the banks.

6.2 Ability to reduce information asymmetries

The second research question is about the ability of the guarantee bank to reduce asymmetric information. For evaluating the impact of the guarantee bank on information asymmetries between the lending bank and the borrower, the amount and the frequency of information provided by SMEs after obtaining a loan with guarantee was examined. In this context, proposition 3a tested whether "SMEs provide more and more regular information to the lending bank as consequence of obtaining the guarantee from the guarantee bank". This proposition has been evaluated by asking SMEs as well as by interviewing bank managers about the firms' provision of information. Since it is not only a question of how much or how often information is shared but also of the quality of the information, all interviewees have additionally been asked about the value of information that is provided by the borrowers.

The interviewees stated that no additional information about the borrowers will be collected as a direct consequence of the inclusion of a guarantee from the guarantee bank in a SME loan (part B, question 7: 100.0%). The central reason for insisting on the guarantee is the lack of collateral and not necessarily a lack of information. If not enough information is available to thoroughly evaluate the business idea and the future prospects of a firm, a loan will probably not be provided. This confirms existing literature about the role of information in bank lending (Stiglitz and Weiss, 1981; Grunert and Norden, 2012; Van Caneghem and Van Campenhout, 2012). The interviewees all stated that the inclusion of a guarantee does not enhance the information flow because the guarantee bank demands the same information for their

assessment as the commercial banks do. However, some interviewees, indeed, mentioned that the guarantee bank requires more information because it demands an assessment report from a chamber or other organization. However, these reports contain no additional valuable information for the commercial banks. The answers of the interviewees have demonstrated that in some cases the guarantee bank needs additional information about existing customers of the commercial banks. As opposed to the guarantee bank, commercial banks already have information about the SME's management, financial situation, credit history and past success. The guarantee bank commonly does not know the customers and, therefore, needs additional information to assess the application. Thus, in these cases, borrowers provide more information than required by the commercial banks because of the inclusion of the guarantee. However, since the commercial banks still have the information, it does not mean additional valuable information for them. These results are in contrast to the conceptual literature about the ability of Credit Guarantee Schemes to foster the creation of additional information (Craig et al., 2008; Kramer, 2008; Levitsky, 1997a; Vogel and Adams, 1997). However, the answers of the interviewees have demonstrated that the provision of the guarantee often provides the basis for the provision of a loan. This, in turn, builds the basis for an exchange of information between the lending bank and the borrowers over the course of time. In this regard, interviewees argued that guarantee banks can, indeed, be considered to be helpful institutions to reduce information asymmetries. Without the guarantee, a loan would probably not have been provided and the opportunity to generate further information would not have occurred. Consequently, the above mentioned literature can be confirmed. The provision of a guarantee generally provides the opportunity to the lending banks to collect information about a borrower over time.

Regarding the answers of the SMEs, 49.0 per cent confirmed to provide more information to the commercial bank after they have received the loan including a guarantee from the guarantee bank (Part II, Q 3c: mean value 2.39, standard deviation 0.917). Considering the demographic factors, a statistically significant relationship between the amount of information provided and the size of a firm was found ($p=0.021$, Sign. <0.05). While the majority of small firms indicated to provide more information, the majority of bigger firms denied to provide more information after the loans including a guarantee were received. Since smaller firms especially are related to information asymmetries (Berger and Udell, 1998; Behr and Guettler,

2007; Ortiz-Molina and Penas, 2008) this result indicates that the provision of a guarantee from the guarantee bank is beneficial to overcome credit restrictions for these SMEs. For smaller firms, the assumption expressed in existing studies that more information is provided as a direct consequence of the inclusion of a guarantee from a guarantee scheme (Craig et al., 2008; Kramer, 2008; Levitsky, 1997a; Vogel and Adams, 1997; Green, 2003) can be confirmed.

Considering the answers about the interval of information provided, the majority of all respondents (68.3%) confirmed to provide information more regularly since the loan with guarantee was obtained (Part II, Q 3d: mean value 2.03, standard deviation 0.866). The analyses of the relationship among the demographic factors and the interval of information provided demonstrated that younger firms provided information more regularly after the loans including a guarantee were obtained ($p = 0.056$; Sig. < 0.1). Additionally, smaller firms provided information more regularly after the loans including a guarantee were obtained ($p = 0.078$; Sig. < 0.1). These firms are especially related to be informational opaque (Berger and Udell, 1998; Behr and Guettler, 2007; Ortiz-Molina and Penas, 2008). Consequently, the results have demonstrated that for these firms, guarantees from the guarantee bank can be considered as beneficial instrument to mitigate information asymmetries. The quantitative results are consistent with the qualitative results. Eight out of ten interviewees answered that information is required more regularly after the loan is provided (part B, question 7, 80.0%). This is especially true for new customers or start-ups. Commercial banks know nothing about these customers and have to learn quickly about their ability to manage a business. They monitor the firms more regularly to identify undesirable developments as soon as possible and to be able to react in time. The results of the statistical analysis have also demonstrated that Present Old Hands (long-lasting customers that are often in contact with their bank) show significant agreement with the statement about providing information more regularly (70.6%). The interviewees explained this with the regulations of the German Banking Act. Firms that exceed a certain loan amount have to provide information more regularly. Existing customers often already have other loans when applying for the loan that is provided with a guarantee from the guarantee bank. When the limit mentioned above is exceeded by this loan, they have to provide information more regularly by law (§18 KWG, see Section 5.4). However, in these

cases, the more regular provision of information is not directly related to the inclusion of a guarantee from the guarantee bank itself.

This all demonstrates that sometimes indeed more information is provided by borrowers that have obtained a loan including a guarantee. However, the results have also demonstrated that this often is not a direct result of the guarantee from the guarantee bank as supposed by the conceptual literature (Craig et al., 2008; Green, 2003; Kramer, 2008; Levitsky, 1997a; Vogel and Adams, 1997). However, this cannot necessarily lead to a rejection of proposition 3a. The research findings have demonstrated that the provision of the guarantee from the guarantee bank is crucial for providing the loan. Consequently, the provision of the guarantee helps to overcome information asymmetries. Without the guarantee from the guarantee bank, no loan will be provided, and the borrower and the lending bank will not have the opportunity to exchange information and reduce information asymmetries.

6.3 Impact on the relation between borrower and bank

The third research question is about the ability of Credit Guarantee Schemes to create lending relationships. Out of this research question, proposition 3b was derived: “The more intense provision of information supports the creation of a bank-borrower relationship”. To evaluate this, all interviewees were asked whether lending relationships can be created that would not have been created without the guarantee from the guarantee bank (part C, question 10). All ten of them (100.0%) confirmed this. According to their answers, the provision of the guarantee was a precondition for the provision of the loans, and the provision of the loan was the precondition for the creation of a lending relationship. This means that the provision of the guarantee from the guarantee bank can act as cornerstone for the establishment of the bank-borrower relationship. Without the guarantee, the bank would not have provided the loan. Now the bank has the opportunity to learn about the borrower. As time goes by, a lending relationship can grow and deepen. Regarding the survey results, 42.9 per cent of all respondents agreed with the statement that the relationship with the bank has intensified since they have received the loan with guarantee from the guarantee bank (Part II, Q 3f: mean value 2.49, standard deviation 0.831). No significant relationship has been found between the impact of the loan with guarantee on the lending relationship and the demographic variables. For testing whether the answers

of existing customers differ from those of new customers, the cluster results have been analysed. However, these results were again not statistically significant ($p = 0.995$, Sig. ≥ 0.1). A significant relationship that has been determined is between the lending relationship and the amount of information provided ($p = 0.000$; Sig. < 0.01). SMEs that confirmed that they provide more information to their bank after receiving the loan also answered that the relationship has intensified. Firms that did not provide more information denied the creation of a lending relationship. This confirms proposition 3b. Since the loans would not have been provided without the guarantee from the guarantee bank and the provision of the loan allows the collection of information in the first place, it can be said that the guarantee bank facilitates the creation of bank-borrower relationships.

Summing up the qualitative and quantitative results, a relationship between the provision of a guarantee from the guarantee bank, the collection of additional information and the creation of lending relationship has been confirmed. Existing literature has confirmed a positive impact of lending relationships on the loan availability for SMEs (Harhoff and Körting, 1998; Cole, 1998; Behr et al., 2011). The connection between the provision of a guarantee from a Credit Guarantee Scheme and the creation of a lending relationship has never been tested. Therefore, the present research has confirmed a positive relationship between these two topics, at least for the guarantee bank in Hessen.

6.4 Overcoming of credit restrictions

Following the fourth research question, proposition 4 is: “Guarantee banks help to mitigate credit restrictions for SMEs”. The aim of this proposition is to test whether guarantee banks can reduce credit restrictions for initial loan provisions as well as for follow-up loans which means on a long-term perspective.

To analyse the impact of a guarantee on an initial loan application, all interviewees were asked whether guarantees from the guarantee bank help to overcome credit restrictions (part D, question 13). Eight of them confirmed this (80.0%). Since a guarantee acts as a substitute for collateral for the lending banks, it allows providing loans to SMEs for viable business projects when the expected loss would otherwise be too high. Without guarantees, the loans would not have been provided. The findings are consistent with those of Menkhoff et al. (2012). This effect has been

demonstrated in Figure 5.1 above and shows how the provision of a guarantee from the guarantee bank can reduce credit restrictions for SMEs in individual cases. The major importance of reducing the default risk for the lending banks is also underlined by the statements of the interviewees about the consequences of a denial of the guarantee bank to provide a guarantee (part A, question 4). All of them answered that in case of a negative decision of the guarantee bank the loan would not be provided. Additionally, these findings are confirmed by the results of the web survey. All SMEs have been asked about the significance of the guarantee for obtaining the bank loan (Part II, Q3e). Their answers supported the high significance of the provision of a guarantee from the guarantee bank for the availability of a bank loan (mean value 1.46, standard deviation 0.705).

To test the impact of guarantees on the sustained access to bank loans, all SMEs were asked whether they needed a follow-up loan after they have received the loan including a guarantee from the guarantee bank and whether they needed a guarantee for the later loan (Part II, Q 4 and 5). Out of the 157 respondent firms 61 applied for a follow-up loan (40.1%). From these 61 firms, only 6 (9.8%) needed a follow-up guarantee. This low number, indeed, indicates that something must have changed between the initial and the following loan application. However, these results did not allow a proper statistical analysis for several reasons. First of all, this number is too low to allow a representative analysis. Besides this, no statistically significant relationships between the firms that needed a follow-up guarantee and the demographic factors have been found (see Appendix IX). Moreover, the reasons for the need of the guarantee for the follow-up loan could not be analysed by the web survey.

To assess the ability of the guarantee bank to mitigate credit restrictions in the long term, all interviewees were asked whether the fact that a guarantee was included in an initial loan facilitates the provision of a follow-up loan (Part D, Q 14). They all denied this (100.0%). The answers of the interviewees have demonstrated that each loan application will be assessed in the same way, independently of the inclusion of a guarantee for the initial loan. Whether a guarantee will be needed is again dependent on the probability of default of the borrower and on whether the bank needs a third party to take on a certain amount of risk. The information that might have been collected during the credit term of the initial loan and the relationship and trust that

might have been built during that time, of course, facilitate the loan decision. In this respect, the provision of the guarantee plays an important role since it enabled the provision of the first loan and acted as cornerstone for the collection of information and the building of a lending relationship. These findings are in line with the conceptual studies presented in the literature review (Craig et al., 2008; Green, 2003; Vogel and Adams, 1997). However, the guarantee has no direct impact on the decision about whether a follow-up loan can be provided and, if so, whether it can be provided with or without guarantee from the guarantee bank. For this decision, only the business project and the default risk are decisive factors.

Summing up, it can be said that proposition 4 can only be confirmed partly. Regarding a single credit decision, guarantees from guarantee banks indeed can mitigate credit restriction. However, credit restrictions cannot necessarily be reduced in a sustainable way by guarantee banks. This depends on the collateral that can be provided by the firm and the inherent risk of a follow-up loan.

7 Conclusions and recommendations

This section contains the main findings, limitations and implications of the present research. Section 7.1 starts with highlighting how the present research contributes to the existing literature, transfers the research findings to the framework of the learning process and explains the extent to which the research objective has been fulfilled. Section 7.2 describes a typology of firms that have been supported by the guarantee bank. Section 7.3 makes practical implications for further research to capture and integrate the new findings of the present thesis, to overcome existing limitations and to broaden the research about German guarantee banks.

7.1 Main findings

The present research makes some contributions to the debate about the efficiency of the German Credit Guarantee Scheme. German guarantee banks are supported by the state. Since the federal government and the states take on a major amount of risk when a guarantee is provided, it is important to consistently monitor the efficiency of the guarantee banks. This is crucial for making sure that the desired aim to make available loans to SMEs with promising business concepts but not enough collateral is achieved. The provision of loans enables SMEs to start or carry on a business. This has an enormous impact on the overall economy. It is important that the “right” firms are supported. This means that firms that are too risky should not be supported and firms that are promising should receive financial support. In this context, it is important to ensure that guarantees are allocated to those firms that are really promising and guarantees are not only used to realize more risky loans or generate additional profits. Existing studies have already demonstrated that guarantee banks have a positive impact on the access to bank finance for SMEs (Kramer, 2008; Langer and Schiereck, 2002) and are economically beneficial due to the creation of jobs and having a positive impact on the GDP (Schmidt and van Elkan, 2010; Schmidt and van Elkan, 2006). The present research picks up on some additional issues. It connects a range of research approaches which have not been interrelated so far and adapts them to the German guarantee scheme. The basis of the present research is built from conceptual papers about the ability of Credit Guarantee Schemes to alter the lending behaviour of banks (Craig et al., 2008; Green, 2003; Levitsky, 1997a; Vogel and Adams, 1997). These papers refer to a reduction of

information asymmetries between SMEs and lending banks which can be achieved by the inclusion of a guarantee from a guarantee scheme in a SME loan. Information asymmetries are considered as being one significant cause of the restricted access SMEs have to bank loans (Berger and Udell, 1998; Ortiz-Molina and Penas, 2008). However, it is not the only reason for which banks deny loans to SMEs. Existing literature about credit restrictions have also referred to related risk (Beck et al., 2010; Waschbusch and Straub, 2008; Gudger, 1998), lack of collateral (Harhoff and Körting, 1998; Berger and Udell, 1998; Columba et al., 2010) and relatively higher costs and lower profitability of SME loans (Bosse, 2009; Levitsky, 1997a; Riding et al., 2007). Therefore, the research started with evaluating the reasons for the requirement of a guarantee from a guarantee bank when a loan decision is made by commercial banks. In a next step, the research concentrated on the role the guarantee plays for the provision of a SME loan. It was assumed that guarantees from the guarantee bank are required when the borrower cannot provide their own collateral to reduce the risk for the lending bank. This expectation was derived from general literature about the role of collateral in bank lending (Bester, 1985; Besanko and Thakor, 1987; Gonas et al., 2004; Berger et al., 2011a). So far, only one study has been found that tested the relation between guarantees from a Credit Guarantee Scheme and the significance of collateral for SME loans (Menkhoff et al., 2012). This study is not concentrated on the German guarantee banks (but on the scheme in Thailand). Therefore, the adaption of collateral issues to the analysis of German guarantee banks within the present thesis is an innovative contribution to existing research. Moreover, the present research examined existing papers about market imperfections as one rationale for the existence of Credit Guarantee Schemes (Stiglitz and Weiss, 1981; Grunert and Norden, 2012; Van Caneghem and Van Campenhout, 2012; Akerlof, 1970). Here, again, only one study has been found that concentrates on the relation between information asymmetries and Credit Guarantee Schemes so far (Uesugi et al., 2010). This study analysed the creation of moral hazard of the Japanese guarantee scheme. Additionally, the present research includes the impact of German guarantee banks on the creation of lending relationships. Existing literature has demonstrated that lending relationships help to overcome credit restrictions (Behr et al., 2011; Berger and Udell, 1995; Cole, 1998; Harhoff and Körting, 1998). However, no research about the impact of the inclusion of a guarantee from a guarantee scheme in a SME loan on the establishment of a lending

relationship has been found so far. Finally, the literature review has demonstrated that existing studies did not explicitly analyse the impact of guarantee schemes on mitigating credit restrictions for SMEs in a sustainable way which is considered to be desirable.

The use of different fields of research which had not been applied to Credit Guarantee Schemes and the focus on German guarantee banks present an innovative research framework which is much more complex than many existing studies. The complete framework is illustrated in Section 2.6. The mentioned literature was never combined in a comparable way and the above explained relationships were never tested for the German guarantee banks or another Credit Guarantee Scheme in the world. In this context, the present research provides a new research approach for analyzing Credit Guarantee Schemes in general and the German guarantee banks in particular.

The research has partly confirmed existing research findings. However, it has also presented contradictory findings includes some limitations. Moreover, some additional or new aspects have been discovered which underline the contributions of the existing research. Table 7.1 illustrates the allocation of the present research findings according to the respective research proposition. References to confirming results refer to those studies whose results have been confirmed. References to contradictory results refer to those studies with differing results.

Table 7.1: Research findings

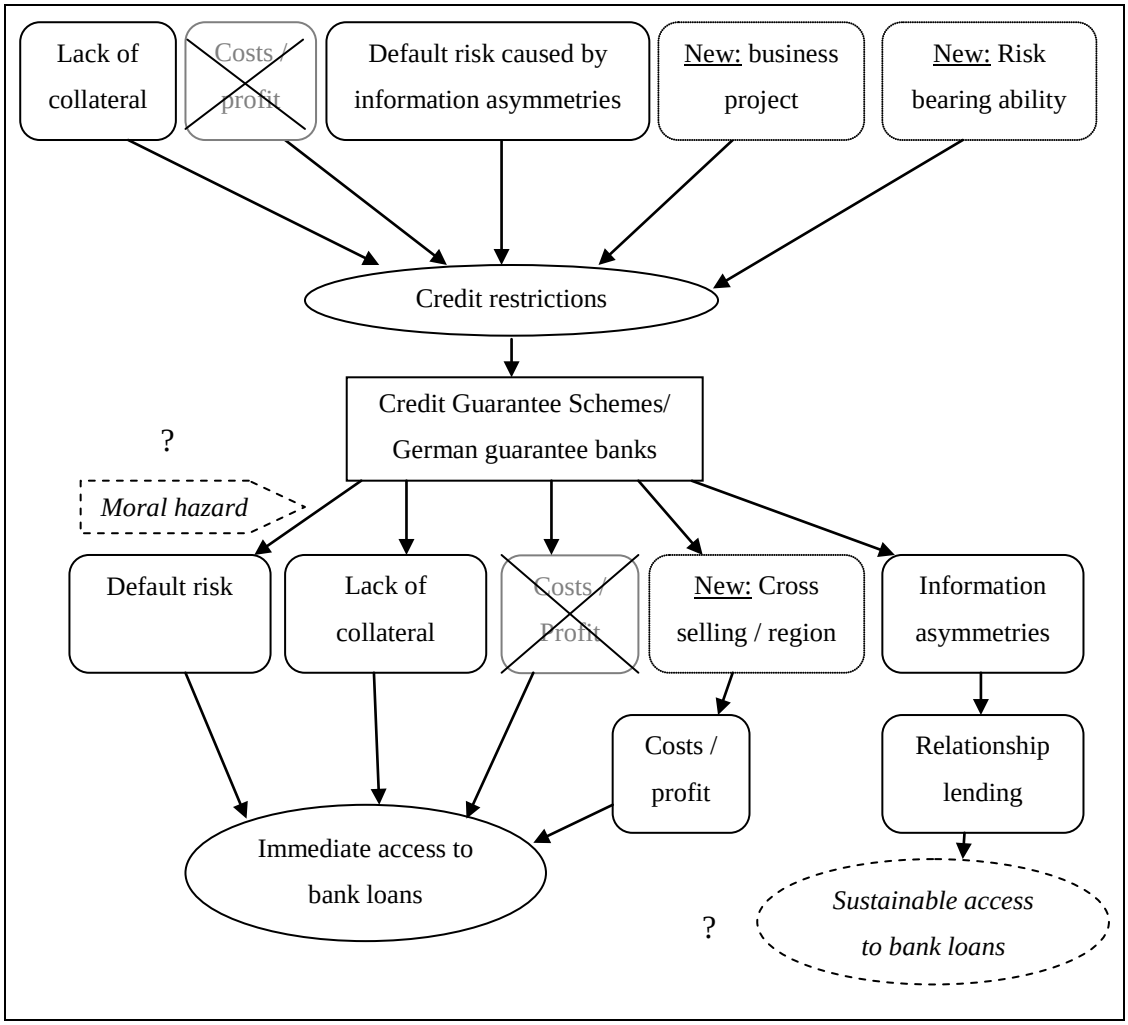
Proposition 1: SMEs have difficulties in obtaining bank loans because of a higher default risk and lack of collateral. Confirmation of existing research Survey results have confirmed that SMEs have difficulties in obtaining bank loans (Reize, 2011). Survey and interviews have revealed no relationship between demographic factors and difficulties in obtaining loans (Schwarz and Zimmermann, 2012; Zimmermann and Steinbach, 2011; Bauer and Zimmermann, 2010). New/additional findings Interviews have revealed the importance of the viability of the business project for loan decisions. Interviews have demonstrated that weak business projects result in loan denials independent of guarantee provision.
Proposition 2a: Providing a guarantee acts as a substitute for collateral and allows SMEs to receive a bank loan. Confirmation of existing research Survey and interview results have confirmed the significance of guarantees and collateral for receiving a SME loan (Schmidt and van Elkan, 2006; Stefanovic, 2009). Interviews have revealed that guarantees act as substitute for a lack of collateral and make available bank loans for SMEs (Menkhoff et al., 2012; Berger et al., 2011b). New/additional findings The interviews have revealed a relationship between the size and the risk-bearing ability of a bank and its collateral requirements as well as the meaning of a guarantee from a guarantee bank for providing a bank loan. Limitations Answers of the interviewees have shown some indications for the potential existence of moral hazard on the part of the commercial banks but this could not be proved.
Proposition 2b: Including a guarantee from the guarantee bank makes SME loans more profitable for banks. Contradictory findings Contrary to existing literature the interviews have demonstrated that the inclusion of a guarantee from a guarantee bank produces a higher amount of work and higher costs for the banks (Green, 2003; Levitsky, 1997a). New/additional findings Interviews have revealed a connection between the expected cross-selling potential and the decision about providing a loan that includes a guarantee from a guarantee bank. Interview results have shown that cross-selling prospects and the support of a certain region might lead to commercial banks taking a greater risk (moral hazard).

Table 7.1 (continued)

Proposition 3a: SMEs provide more information and more regular information to their bank as a consequence of obtaining the guarantee from the guarantee bank. Confirmation of existing research Smaller and younger SMEs provided more information and/or more regular information to the commercial banks after they have received the loans including guarantees from the guarantee bank (Levitsky, 1997a; Green, 2003; Craig et al. 2008). Contradictory findings Survey and interviews demonstrated that the inclusion of a guarantee from a guarantee bank itself does not necessarily generate additional valuable information for the commercial banks but, indeed, builds the basis for reducing information asymmetries (Craig et al., 2008; Kramer, 2008; Levitsky, 1997a; Vogel and Adams, 1997).
Proposition 3b: Increased information supports the creation of a bank-borrower relationship. New/additional findings Survey and interview results have disclosed that the provision of a guarantee helps to improve the relationship between bank and borrower.
Proposition 4: Guarantee banks help to mitigate credit restrictions for SMEs. Confirmation of existing research Survey and interviews confirmed that the provision of a guarantee enables the provision of an initial loan for SMEs (Craig et al., 2008; Green, 2003; Vogel and Adams, 1997). Limitations Survey and interviews could not provide evidence for a reduction of credit restrictions in a sustainable way.

In Section 2.6 the key factors that are assumed to have an influence on the access to bank loans for SMEs in the considered context and their predicted role within the framework of the present research have been presented. Figure 7.1 illustrates the established framework according to the research findings which have been presented in Section 6 and summed up in Table 7.1. It becomes obvious that some relationships can be confirmed while others have to be rejected. The analysis also revealed additional factors that play a role in the overall process. These have been added. For some relationships however, no definitive statement can be made due to data limitations. The findings are discussed in detail below.

Figure 7.1: Main findings about the predicted learning process



Source: Own illustration

The research findings have confirmed that risk, lack of collateral and information asymmetries can lead to credit restrictions for SMEs. It has also been confirmed that the provision of a guarantee from the guarantee bank mitigates these credit restrictions since it lowers the default risk for the lending bank by providing additional collateral. Therefore, the present research has confirmed a positive impact of the guarantee bank on the access to bank loans for SMEs. A provision of a guarantee enables SMEs without adequate collateral to receive a bank loan that otherwise would not have been provided. In this respect, the existence of the guarantee bank seems to be justified.

Regarding the costs and the profitability of commercial banks, the research findings have demonstrated that a guarantee from the guarantee bank does not directly reduce costs and improve profitability for the lending banks. By contrast, the research findings have shown that the inclusion of a guarantee means greater amount of work

for the lending banks and, therefore, reduces the profitability. Hence, the cost aspects mentioned by Green (2003) and Levitsky (1997a) have not been confirmed. However, the research findings have revealed how guarantees from guarantee banks indirectly impact the profitability of lending banks and the access to bank loans: cross-selling and the support of the region. Since existing literature has not considered these factors so far, this will be explained in more detail in the following section.

The research findings have also demonstrated that guarantees from guarantee banks are useful instruments when the risk-bearing ability of a bank would normally not allow the provision of a loan. Up to now, the relation between the inclusion of a guarantee from a guarantee bank in a SME loan and the risk-bearing ability of the lending bank has not been evaluated. Making this relation known is another contribution of the present research, and additional investigation of this area should be considered for further research.

The research findings have demonstrated that the presentation of a viable business project is important when applying for a bank loan. The interview partners stated that they consider the competition in the market, the experiences of the business owner and the infrastructure and the location of a business when assessing the viability of the project. SMEs that cannot provide a convincing business project will probably not receive a bank loan. In these cases even the provision of a guarantee from the guarantee bank will not mitigate credit restrictions. Consequently, the business project has been added to the research framework.

Concerning the ability of the guarantee bank to reduce information asymmetries, the research findings have demonstrated that the provision of a guarantee from the guarantee bank enables the provision of a loan in the first place. This offers the opportunity to the commercial banks to collect information and, therefore, to mitigate information asymmetries over time. This confirms the existence of a learning process initiated by the provision of a guarantee from the guarantee bank as expected by existing literature (Green, 2003; Craig et al., 2008; Levitsky, 1997a; Vogel and Adams, 1997). However, the research has demonstrated that additional information is not consequently generated by the inclusion of a guarantee from the guarantee bank but the provision of the guarantee indeed builds the basis for a more intense exchange of information that might result in reducing information asymmetries.

The research findings have revealed another factor that fosters the reduction of information asymmetries and that has not been analysed before: the creation of lending relationships. The present research has demonstrated that lending relationships can be generated and intensified as a consequence of the provision of a SME loan which could not have been provided without the support of the guarantee bank. This unique finding underlines the importance of the guarantee bank for SME lending.

However, the present research did not find evidence for a direct relation among the provision of a guarantee from the guarantee bank, the reduction of information asymmetries, the building of a lending relationship and the reduction of credit restrictions for SMEs in a sustainable way. The research findings have demonstrated that even if the provision of a guarantee leads to a reduction of information asymmetries and an intensification of the relationship between the lending bank and the borrower, this will not necessarily result in a long-lasting mitigation of credit restrictions. Every loan application will be assessed thoroughly, and the final decision will be dependent on a range of other factors including the risk of a loan and the ability of a firm to provide their own valuable collateral. Therefore, further research is needed to evaluate the relationship between the provision of a guarantee from the guarantee bank and the mitigation of credit restrictions for SMEs in a sustainable manner.

At this stage, a final statement can be made about whether the present research has fulfilled the initial research objective which was:

Research objective:
To reveal whether the provision of a guarantee from a German guarantee bank can initiate a learning process on the side of the commercial bank which helps to mitigate existing information asymmetries concerning SMEs, supports the building of a long-term customer-bank relationship and helps to overcome credit restrictions.

Referring to the research objective, it can be said that the present research has indeed found evidence for the ability of the guarantee bank to initiate a process of learning for the commercial banks by providing the opportunity to collect information and create lending relationships. This is caused by the fact that the provision of a guarantee from the guarantee bank enables the provision of loans that otherwise

would not have been provided since guarantees from the guarantee bank compensate for the borrower's insufficient collateral and reduce the risk for the lending banks. Therefore, the guarantee bank can directly reduce credit restrictions for SMEs. This leads to the conclusion that the guarantee bank is a useful instrument to facilitate the access to bank loans for SMEs.

The literature review has demonstrated that the central aim of all Credit Guarantee Schemes in the world is to support SMEs receiving bank loans. Using the example of the guarantee scheme in Germany, the present research has demonstrated that these schemes can initiate the expected process of learning. Consequently, the research provides evidence for the ability of guarantee schemes to mitigate credit restrictions and build the basis for reducing information asymmetries and creating lending relationships.

However, to evaluate whether Credit Guarantee Schemes help to overcome credit restrictions in a sustainable manner and not foster moral hazard on the side of the lending banks could not be proved by the present PhD thesis. To evaluate this, a longitudinal study seems to be appropriate.

7.2 Types of supportable firms

The findings of the web survey and the semi-structured interviews allowed the development of a classification of those firms that are typically benefitting from the existence of the guarantee bank. Section 1.6 has highlighted the formal prerequisites that exist for obtaining a guarantee from a guarantee bank. These are minimum standards firms have to fulfill to qualify for receiving a guarantee from a guarantee bank like being a SME corresponding to the definition of the European Union and being engaged in particular business sectors (Schmidt and van Elkan, 2006). In analyzing those firms that have already received a guarantee from the guarantee bank, the research has revealed some additional features which can be considered as being characteristic. These features allowed the creation of a typology of firms that receive a guarantee from the guarantee bank. Such a typology dealing explicitly with the characteristics of firms that are eligible for a guarantee from the guarantee bank is a new contribution to the research about guarantee banks. SMEs that are credit restricted and fulfill the formal prerequisites can use this typology to ascertain

whether an application for a guarantee from the guarantee bank can be an option to improve their access to bank loans.

In general, the research findings have demonstrated that firms that receive a guarantee from the guarantee bank typically are small SMEs. Regarding the legal form, most SMEs that receive a guarantee from the guarantee bank are sole proprietors or limited companies. An important requirement for obtaining a guarantee is the viability of the business project. Moreover, guarantees are typically provided to SMEs that cannot provide enough of their own valuable collateral.

Besides these general characteristics, a more detailed distinction can be made according to the existing relationship between the lending bank and the borrower at the time the firm has applied for the loan. The cluster analysis discussed in Section 4.7 has demonstrated that it can be distinguished between firms that have already been customers to the lending banks before they have received the loan including the guarantee and firms that become new customers to the bank when receiving a loan. Firms with an existing relationship have been labelled Old Hands and SMEs that had no relation to the bank were labelled Rookies within the present thesis. Additionally, Old Hands and Rookies have been subdivided according to the contact frequency with their bank. Firms with only few contacts to the lending bank received the notation reserved, firms with frequent contact obtained the notation present. The research results have demonstrated that this classification can also be used for creating the typology. This allows firms seeking a bank loan and facing credit restrictions without the support of a guarantee bank to identify the particular beneficial characteristics for obtaining a guarantee depending on their current relationship and their contact frequency to the bank. The respective typology is subdivided into typical demographic characteristics including the purpose of the loan and the type of the lending bank.

Old Hands

Old Hands are typically SMEs that have been customers to the lending bank for more than nine years at the time they have applied for the loan. This implies that the lending bank had some knowledge about the firms and the business success. The following can be considered as being characteristic for these firms:

Main demographic factors:

Old Hands typically have existed for more than nine years at the time the loan including a guarantee from the guarantee bank was obtained. Old Hands contain SMEs of all sizes. According to the contact frequency a distinction can be made for the legal forms of the firms. While Present Old Hands more often have a legal form of unlimited liability, Reserved Old Hands more often have a legal form of limited liability.

Purpose of the loan:

Present Old Hands often received the guarantee for a start-up loan. Since Old Hands are firms that have already existed for a range of years, the loan is not needed for the foundation of the firms but for mergers and acquisitions for example. Reserved Old Hands more often received the loan for financing working capital and therefore for bridging liquidity shortages rather than for financing growth.

Lending bank:

Most of the loans for Present Old Hands are provided by savings banks while Reserved Old Hands obtain the majority of their loans from co-operative banks. This implies that it is most promising for these firms to apply for a loan at savings banks or co-operative banks.

Rookies

Rookies are firms that had no contact to the lending bank before they applied for the loan. Hence, these SMEs were new customers for the lending banks and the banks usually did not have any information about these firms at the time they applied for the loan.

Main demographic factors:

Rookies are micro firms with 1-9 employees. Moreover, Rookies are younger than Old Hands. Considering the legal form, it can again be distinguished between Present Rookies and Reserved Rookies. The legal form of Present Rookies is typically one with unlimited liability. As opposed to this, Reserved Rookies are typically firms with limited liability.

Purpose of the loan:

Since Rookies are new customers to the banks, they typically apply for a start-up loan. This applies for both, Present and Reserved Rookies.

Lending bank:

The majority of all Rookies received their loan from a co-operative bank. This applies for Present Rookies as well as for Reserved Rookies. This implies that for those SMEs that need a start-up loan, an application at a co-operative bank seem to be promising.

Table 7.2 provides a complete overview about the typology derived from the research findings of the present PhD thesis.

Table 7.2: Typology of supported firms

	Present Old Hands (overall 42 firms)	**Reserved Old Hands** (overall 42 firms)	**Present Rookies** (overall 36 firms)	**Reserved Rookies** (overall 27 firms)
Size	1-49 employees	1-49 employees	1-9 employees	1-9 employees
Legal form	Unlimited liability	Limited liability	Unlimited liability	Limited liability
Age	> 9 years	> 9 years	Young/middle age	Young/middle age
Purpose	Start-up	Working capital	Start-up	Start-up
Bank type	Savings-bank	Co-operative bank	Co-operative bank	Co-operative bank

Source: Own illustration

This typology allows SMEs that are credit restricted to check whether applying for a guarantee from the guarantee bank can be an option. It is designed to provide information for situations in which a guarantee from the guarantee bank can facilitate bank lending for otherwise credit-restricted firms. This shall be demonstrated by two examples:

A SME that already exists for a couple of years and already has received some loans from a bank with which it has a long-lasting relationship suffers from a liquidity shortfall. It needs a loan for working capital but knows that it will not be able to provide additional collateral. The typology demonstrates that the provision of a guarantee from a guarantee bank can typically help these firms to obtain a bank loan by providing the missing collateral. The typology, therefore, would encourage the firm to apply for a guarantee from the guarantee bank and the bank loan.

The same applies for an entrepreneur who wants to establish a new business. So far, he does not have any contact to a commercial bank. Even if the start-up is related to a higher risk for lending banks and not enough collateral can be provided, the typology demonstrates that a loan will not necessarily be denied. The inclusion of a guarantee from the guarantee can substitute the missing collateral. The typology also demonstrates that it will be most promising to apply for the loan at a co-operative bank since co-operatives have already provided loans in comparable situations.

In this regard, the typology that has been developed from the research findings provides a practical guideline for SMEs that have a viable business project but have to face credit restrictions because of a lack of collateral.

7.3 Further research and limitations

The discussion of the research findings has revealed the need for further research. This is mostly true for those factors that have been exclusively disclosed by the research findings. However, the need for further analysis is also related to some limitations of the present research. Consequently, the thesis is finished with providing some concrete recommendations for further investigation.

The analysis of the interviews has demonstrated that an important prerequisite for obtaining a bank loan is the viability of the business project. The interviewees stated that they consider the competition in the respective market, the infrastructure, the location of the business and the experiences of the business owner when assessing a business project. However, to provide SMEs with recommendations about how to successfully apply for a bank loan (either with or without a guarantee from a guarantee bank), a deeper analysis about what makes a business project viable for commercial banks seems to be important. Since the viability acts as the fundamental prerequisite for obtaining a bank loan, SMEs need to learn more about the criteria commercial banks use to determine a project's viability. This can best be done by conducting additional semi-structured interviews with bank managers engaged in SME lending which may be combined with case studies for obtaining concrete statements.

The interview results have illustrated that the inclusion of a guarantee from the guarantee bank increases costs for the lender and, therefore, does not directly

increase the overall profit for the lending banks. However, interviewees referred to two other areas that might indirectly increase the banks' profits. One of these is the cross-selling potential that can accrue from providing a loan to a SME. When additional services can be offered to the firm that receives the loan with a guarantee from the guarantee bank, these services will generate additional profits for the lending bank. This can make the overall customer relationship profitable even if the loan itself will generate no profit. The cross-selling potential can also be included in the loan pricing by reducing the required risk margin for a loan (Brost et al., 2008). In this case, a loan that might not have been profitable with the inclusion of the guarantee might become profitable due to cross-selling. Another direct impact on the profits of a bank can be generated by supporting the region. As mentioned earlier, savings banks and co-operative banks are limited to a certain region. In contrast to private banks, these banks cannot operate outside their region in Germany. Making available a loan to a firm with the support of the guarantee bank might save or create jobs in the region. When employees are also customers of the bank, this might generate profits that are indirectly related to that loan. The relation between the costs and the profit of SME loans, the decision about whether to include a guarantee from a guarantee bank in a loan and the expected cross-selling potential respectively the support of the region have not been analyzed so far. The present research provided the first indication for a close connection. To further evaluate this, more semi-structured interviews with bank managers are needed. A questionnaire approach is not considered to be suitable since it does not allow further questioning. The interviews should explicitly focus on the importance commercial banks ascribe to additional profits related to cross-selling and the regional economy and whether banks consider these indirect profits when making a loan decision.

Related to the assumption that cross-selling and the support of the region enhance the profit of the lending banks, the question arises of whether the banks' knowledge about indirect improvement of the overall profits provides some indication for moral hazard on the part of the banks. The provision of a guarantee from the guarantee bank allows providing a loan to a firm that normally would not have received a loan due to a higher probability of default. When positive external effects are expected to be generated by the support of such firms, banks might be willing to accept the higher probability of default under the condition that the guarantee bank provides a guarantee. The provision of a guarantee from the guarantee bank provides collateral

to the lender that reduces the loss given default for the bank. Consequently, the provision of a guarantee from the guarantee bank ends up in a reduction of the expected loss. If a bank has a fixed maximum expected loss it is willing to accept[8], the inclusion of the guarantee might lead to a provision of a loan for a SME with a worse credit scoring and therefore a higher probability of default when the guarantee reduced the loss given default. Thus, the provision of a guarantee from the guarantee bank has a direct impact on the access to bank finance for SMEs.

The answers of the interviewees that stated that the provision of the guarantee from the guarantee bank was the only way to realize a loan, gave some indication for the willingness to accept a higher probability of default when the guarantee bank is included. This also holds true for the statements of some interviewees about the risk bearing ability of the commercial bank. The interviewees of smaller banks mentioned that sometimes loans could normally not be provided because the inherent risk will not meet the requirements of the risk-bearing ability of the bank. However, the inclusion of a guarantee from a guarantee bank lowers the default risk which offers the possibility to provide a loan. These statements also provided some evidence for moral hazard. With the present research, the existence of moral hazard on the part of the banks cannot be evaluated extensively. However, considering the possibilities for the existence of moral hazard, further analysis about this topic is needed.

To evaluate whether moral hazard occurs when a guarantee from the guarantee bank is included in a loan provision, information about default rates is necessary. Higher default rates of SME loans that included a guarantee from the guarantee bank compared to those of SME loans that did not include a guarantee from the guarantee bank would be an indication for moral hazard. Another way to analyse moral hazard on the part of the banks is to compare the probability of default of loans with guarantees from the guarantee bank with those without a guarantee. When loans that included a guarantee show higher probabilities of default than the others, this could be an indication that banks are willing to accept a higher probability of default under the precondition that the provision of the guarantee reduces the loss given default by the same amount and the expected loss would not increase. This can also provide some additional information about the impact of the regional limitation on moral

[8] The determination of the maximum expected loss is part of the risk strategy of a bank and defined by banking supervisory standards (Schierenbeck et al., 2008).

hazard. To evaluate this, two data sets are needed. One data set including SME loans with guarantee from the guarantee bank and one without guarantee from the guarantee bank. To obtain those data sets is very challenging in Germany. The present research has demonstrated that data about SMEs that obtained guarantees from the guarantee bank is hardly available and no official data exists that contains information about guarantees from a guarantee bank. Therefore, the best way to get access to the data needed would be to cooperate with one or more commercial banks. At this stage it would be wise to use the existing contacts of those banks that already participated in the semi-structured interviews. These banks have proven their willingness to share information. However, the present research has also demonstrated that banks are very reluctant to provide data about their customers due to the German banking secrecy. If the required data was available, the next challenge would be to find suitable peer groups within the data sets which are really comparable (regarding the size and the age of the firm, the loan volume, available own collateral and the time the loan was received). The problems of data availability and the complexity of the related research might be the reason why no study has evaluated the relationship between moral hazard and the provision of guarantees from the guarantee bank until today. However, for an extensive analysis about whether the existence of guarantee banks is justified, it is important to make sure that it does not foster the creation of moral hazard on the side of the lending banks.

The willingness to accept a higher probability of default when the guarantee bank provides a guarantee must not necessarily be considered as being disadvantageous. The decisive factor is the success of these firms after having received the loan. To evaluate whether firms that obtained a loan including a guarantee performed well, an analysis of the business development is needed. Therefore, further research can be conducted by asking the firms of the present sample or other SMEs that have received loans including a guarantee from a guarantee bank to provide financial key figures of the previous years starting with the year in which the loan was obtained. If the results show that firms have grown and can be considered as sound, the decision to provide the loans will be deemed appropriate. This would also mitigate the threat that is perceived to arise from moral hazard.

Analyzing financial key figures is also expected to be a suitable research approach for a further evaluation of the ability of guarantee banks to reduce credit restrictions

in a sustainable way. The question of whether a long-lasting mitigation of credit restrictions can be achieved by the existence of guarantee banks could not be answered by the present research. Therefore, additional research is needed. According to the research framework about the process of learning, credit restrictions are considered as being mitigated in a sustainable way when SMEs have graduated to borrowers without guarantees (compare Section 2.6). There are various reasons why no guarantee would be needed for a future loan. The provision of the initial loan can activate the learning process which can lead to a reduction of asymmetric information and the building of a lending relationship that have a positive impact on a firm's application for future loans. However, firms that could not provide enough collateral for the initial loan might have grown by the time and be able to pledge enough of their own collateral to receive a follow-up loan without the need for a guarantee. Additionally, the probability of default might have decreased in the meantime because of better financial figures, for example, which leads to a better creditworthiness of the firm. To achieve an expected loss that meets the requirements of the bank, less collateral might be demanded. When the firm can pledge enough collateral, a guarantee is not needed. Thus, another suggestion for further research is to analyse financial data and data about the available assets to be able to assess the development of the firm. This might provide evidence for the role of the guarantee bank for later loan applications. The development of the firms that received a guarantee from the guarantee bank may also act as an indicator for the inherent risk of these firms and may refute the existence of what Cowling (2010) called a type 1 error (that the decision to deny the loan turns out to be right in the end).

First, it is important to evaluate whether a guarantee was needed again for a future loan. Second, a comparison of the key financial figures at the time of the initial loan application and the time of the application for a future loan would show if the financial situations of the firms had changed. It is expected that firms that do not need a guarantee for a future loan would have grown since the initial loan application. This supposes that these firms are able to provide enough valuable collateral for the second loan and, therefore, have graduated to borrowing without guarantees. If this is the case, it can be confirmed that guarantee banks help to overcome credit restrictions in a sustainable way.

Moreover, a deeper analysis of what kinds of collateral (business and personal collateral) have been pledged and what kinds of collateral are required by the banks would be helpful to fully understand that relationship between collateral and the necessity for a guarantee. Additionally, it would be helpful to ask SMEs about what collateral was available at the time of the initial loan application and what collateral was available at the time of the application for the future loan. Since financial key figures do not contain information about collateral that has been provided for a loan, the analysis of financial data has to be combined with semi-structured interviews of the respective SMEs. This would reveal which collateral was available and which has been pledged. The analysis would allow two things: to evaluate the growth of firms as well as to find out which collateral is needed to obtain bank loans. The analysis of growth is expected to provide additional evidence for the ability of guarantee banks to mitigate credit restrictions in a sustainable way. A detailed analysis about collateral is anticipated to help SMEs to learn more about the collateral requirements of commercial banks. When SMEs know which collateral is considered as being sufficiently valuable the firms can concentrate on acquiring the required assets over time. This can also help to facilitate access to bank loans for SMEs.

Summing up, the present research has provided some interesting areas for further investigation. As mentioned above, for further research, established contacts should be used and broadened. Since the present research was limited to the federal state of Hessen, the research should be extended to the other federal states of Germany to provide a complete evaluation of German guarantee banks. This implies that firms from other federal states should be contacted and included for further analyses. Future research can be based on the existing guidelines for semi-structured interviews as well as the existing web survey of the present thesis, each expanded by the respective goals of the research project. A detailed overview about the proposed further research approaches is presented in table 7.3 below. Combined with the existing findings of the present thesis, these research approaches are expected to allow a comprehensive evaluation of the ability of German guarantee banks to mitigate information asymmetries, foster the creation of lending relationships and reduce credit restrictions for SMEs. If this is the case and if the occurrence of moral hazard can be excluded, this will result in providing a real justification for the existence of guarantee banks and the risk taking of the federal government and the federal states in Germany.

Table 7.3: Practical implications for further research

Proposed research	Data	Relevance
Analysis of the definition of a viable business project.	Semi-structured interviews with bank managers, case studies.	Allows learning about what is considered as being a viable business project by commercial banks to qualify for obtaining a bank loan.
Evaluation of the relationship between cross-selling potential/support of the region as well as the risk-bearing ability of the bank and the inclusion of a guarantee from a guarantee bank in a loan to a SME.	Semi-structured interviews with bank managers.	Allows further analysis of the issues revealed by the interviews and helps to evaluate the occurrence of moral hazard.
Comparison of default rates/probability of defaults between SMEs that received a guarantee from a guarantee bank and those that did not receive a guarantee from a guarantee bank.	Analyses of bank data about SME loans that have been provided.	Higher default rates or probabilities of default will provide evidence for moral hazard on the side of the lending banks if default rates/probabilities of default are lower or equal to peer groups that did not need a guarantee for obtaining a loan, moral hazard can be excluded.
Analyses of performances of firms that received guarantees from a guarantee bank.	Analyses of financial key figures of SMEs that obtained loans with guarantees from a guarantee bank.	Weak performances will provide indication for moral hazard on the side of the banks; good performances will reduce the suspicion of moral hazard.
Analysis of the growth of SMEs between the time of the initial loan provision with guarantees and the time of the application for a future loan.	Analyses of financial key figures of SMEs that obtained a loan and data about available assets to pledge as collateral.	Firm growth and no need for a guarantee for a future loan will confirm the ability of guarantee banks to overcome credit restrictions in a sustainable way.
Analysis of the assets available to pledge as collateral at the time of the initial loan provision for which a guarantee was needed and the time of the application for a future loan.	Semi-structured interviews with SMEs.	Accumulation of assets to pledge for collateral and no need for a guarantee for a future loan will confirm the ability of guarantee banks to overcome credit restrictions in a sustainable way. A detailed analysis of collateral will help to provide some indication to SMEs for which collateral is needed to obtain a bank loan and allow a better understanding of the relation between collateral and the need for a guarantee.

Source: Own illustration

Appendix I: Web survey

This appendix consists of screenshots of every questionnaire page followed by a translation in English.

Welcome!

The present survey is part of an empirical investigation within the context of a PhD thesis at Technische Hochschule Mittelhessen University of Applied Sciences. The thesis is concerned with bank lending to SMEs. We kindly ask you to invest 10 minutes of your time to answer the survey. By doing so, you will support our efforts to identify possible reasons SMEs encounter when trying to obtain bank loans. Based on your answers, we may find strategies to mitigate these problems.

We kindly ask you to answer each question only about the loan for which you obtained a guarantee from the guarantee bank when completing the survey since we want to concentrate our study on the function and influence of guarantee banks.

We assure you that we will keep your answers anonymous and confidential at all times. Thank you for your cooperation. If you are interested in the survey results, please send an email to: Anke.Valentin@w.th-mittelhessen.de.

Enjoy answering the survey!

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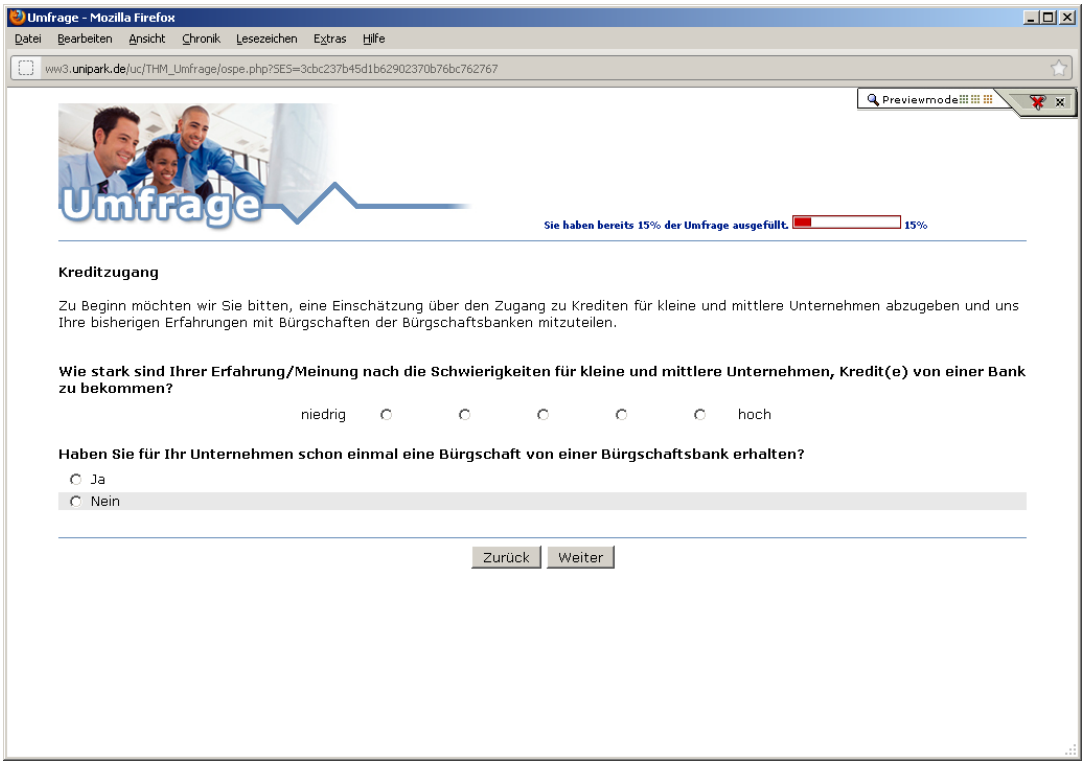


Part I: Access to bank finance

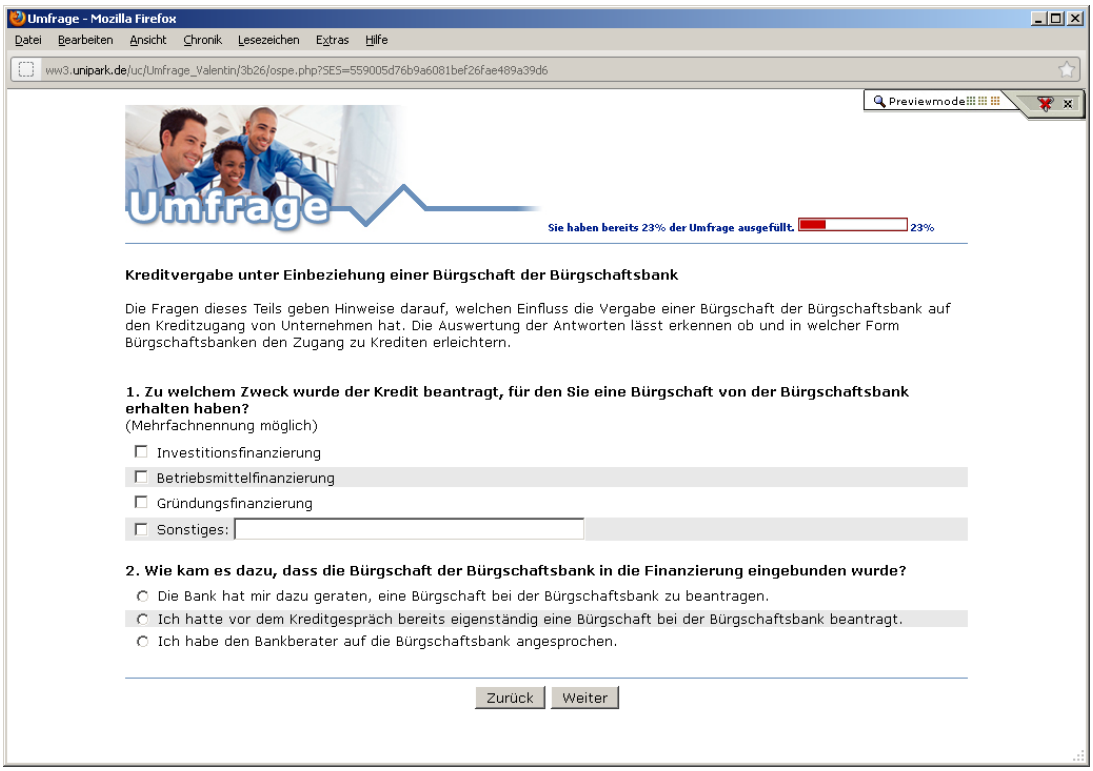
At the beginning we want to learn about your opinion concerning the access to bank finance for SMEs and to inform us about your previous experiences with guarantee banks.

How severe are the difficulties for SMEs to obtain bank loans according to your estimation?

Not severe ○ ○ ○ ○ ○ Severe

Have you ever obtained a guarantee of a guarantee bank?

- o Yes
- o No

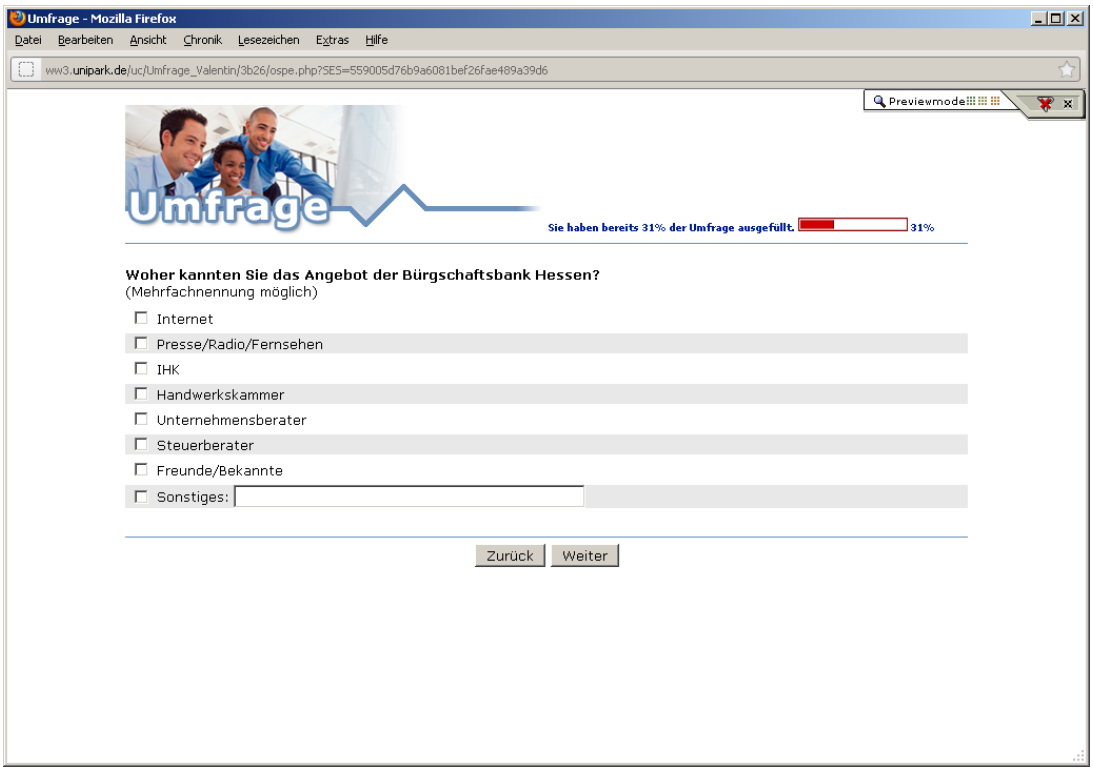


Part II: Loan provision and guarantees of a guarantee bank

The questions of this part will provide an indication about the impact of guarantees from guarantee banks on the access to finance of SMEs. Analyzing the answers will show if and how guarantee banks facilitate the access to bank loans.

1. **For which purpose did you apply for a bank loan?**
   (Multiple selection allowed)
   - ☐ Investment
   - ☐ Start-up
   - ☐ Working capital
   - ☐ Other:

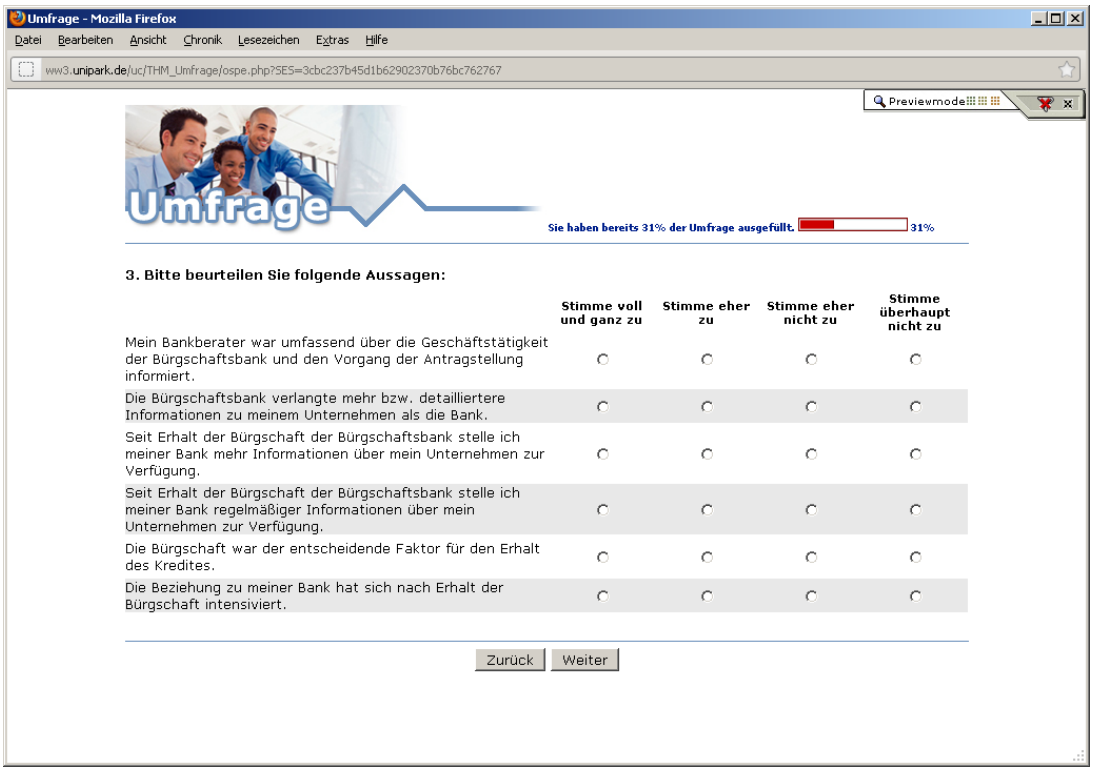
2. **Why have a guarantee been integrated in the loan?**
   - o The bank advised me to apply for a guarantee of the guarantee bank.
   - o I myself applied for a guarantee before talking with the bank.
   - o I asked the bank about integrating a guarantee.



Filter question when respondent himself applied for a guarantee before talking to a bank:

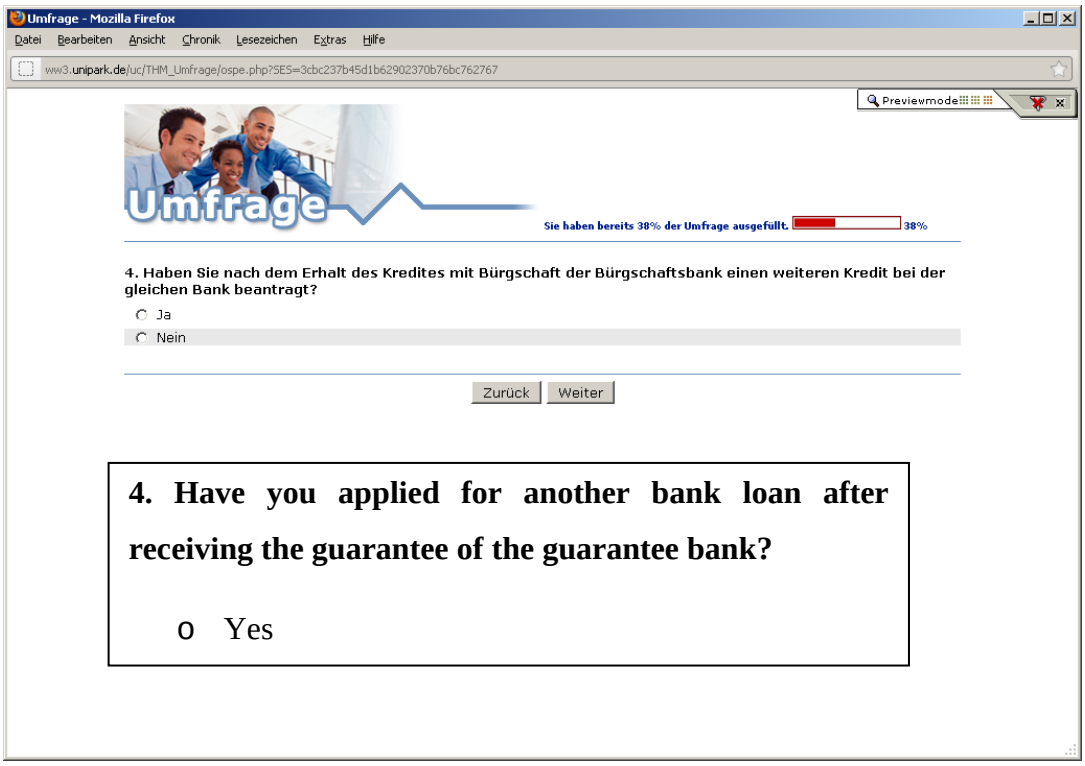
Where did you know the services of the guarantee bank from?
(Multiple selection allowed)

- ☐ Internet
- ☐ Newspapers/Radio/TV
- ☐ IHK (Chamber of Industry and Commerce)
- ☐ Chamber of Trade
- ☐ Management-consultant
- ☐ Tax accountant
- ☐ Friends
- ☐ Other:



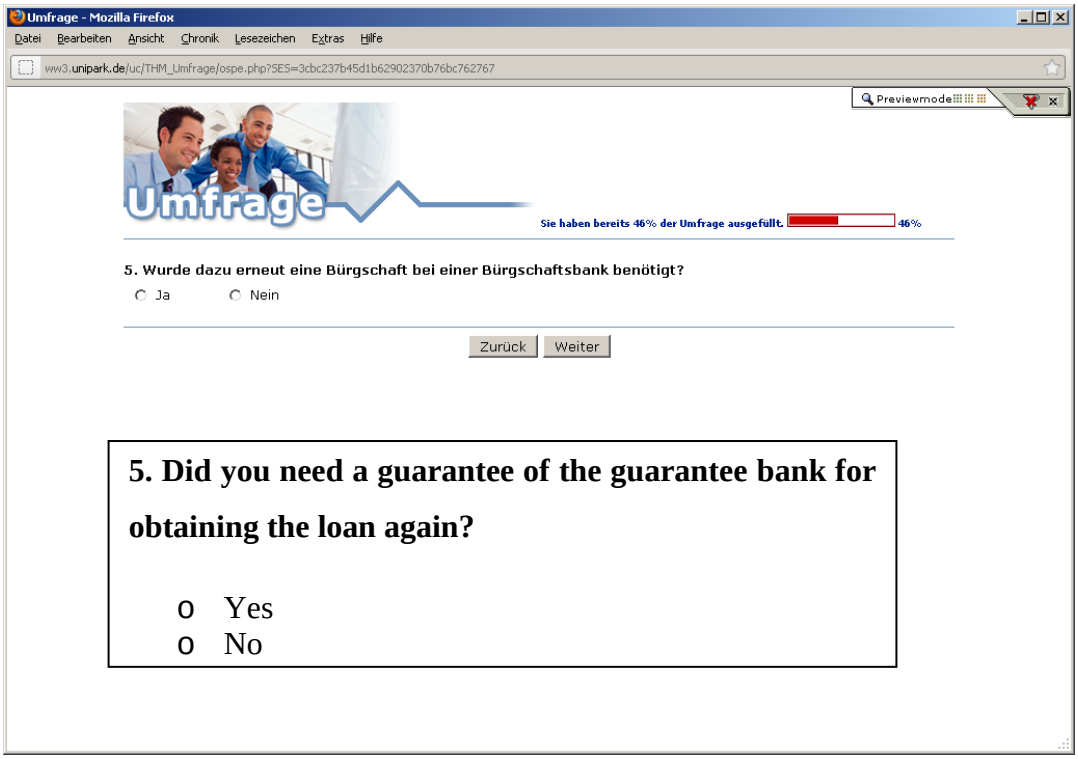
3. Please assess the following statements:

		I absolutly agree	I rather agree	I rather not agree	I absolutly not agree
a)	My bank officer has comprehensively informed me of the business activities of the guarantee bank and the application process.	○	○	○	○
b)	The guarantee bank required more resp. more detailed information about my firm than the bank.	○	○	○	○
c)	Since I have received the guaranteed loan I provide more information about my business to my bank.	○	○	○	○
d)	Since I have received the guaranteed loan I provide more regularely information about my business to my bank.	○	○	○	○
e)	The guarantee was crucial for obtaining the loan.	○	○	○	○
f)	The relationship to my bank has intensified since I have received the guaranteed loan.	○	○	○	○



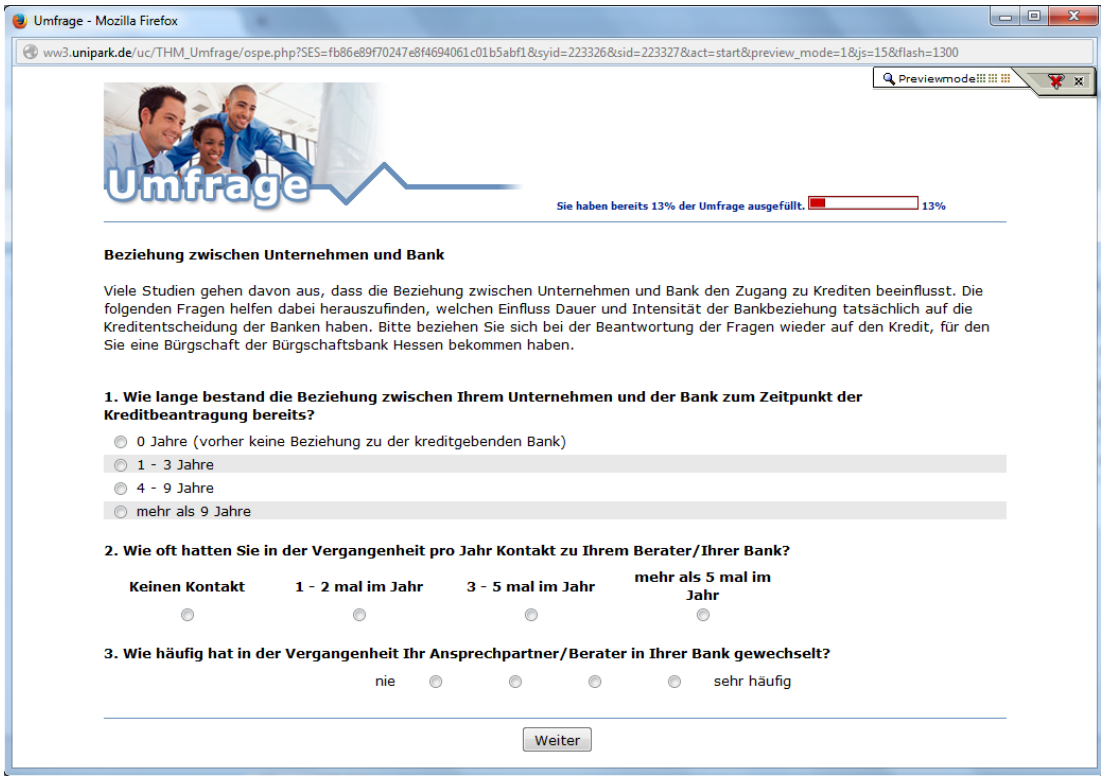
4. Have you applied for another bank loan after receiving the guarantee of the guarantee bank?

- o Yes



5. Did you need a guarantee of the guarantee bank for obtaining the loan again?

- o Yes
- o No



Part III: Bank-borrower relationship

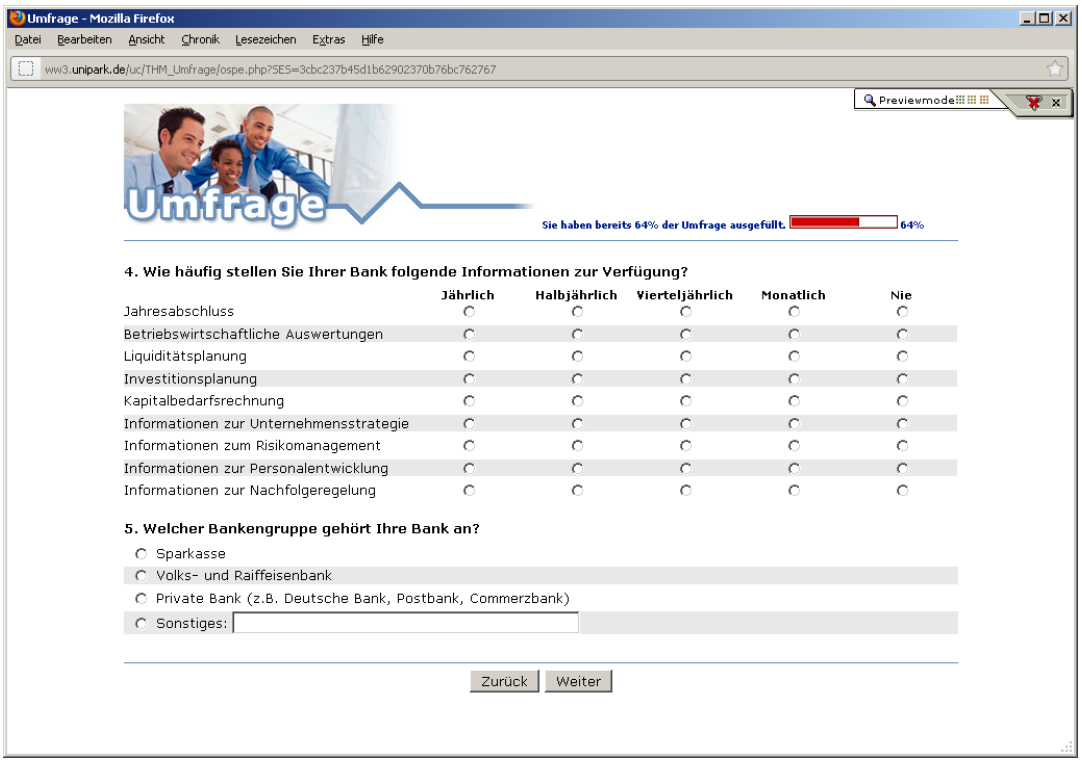
Many studies assume that the relationship beween a bank and a borrower has an important impact on the access to finance. The following questions will help to figure out the actual impact, the duration and strength of a lending relationship has on the bank's decision to provide a loan. Please always refer to the loan for which you received a guarantee of the guarantee bank in Hessen when answering the following questions.

1. **How long did the relationship to your bank already exist when you applied for the loan?**
   - o 0 years (no prior relationship)
   - o 1 – 3 years
   - o 4 – 9 years
   - o more than 0 years

2. **How often have you been in touch with your bank within the past?**
   - o No contact
   - o 1- 2 times a year
   - o 3 – 5 times a year
   - o More than 5 times a year

3. **How often did your contact person in the bank change in the past?**

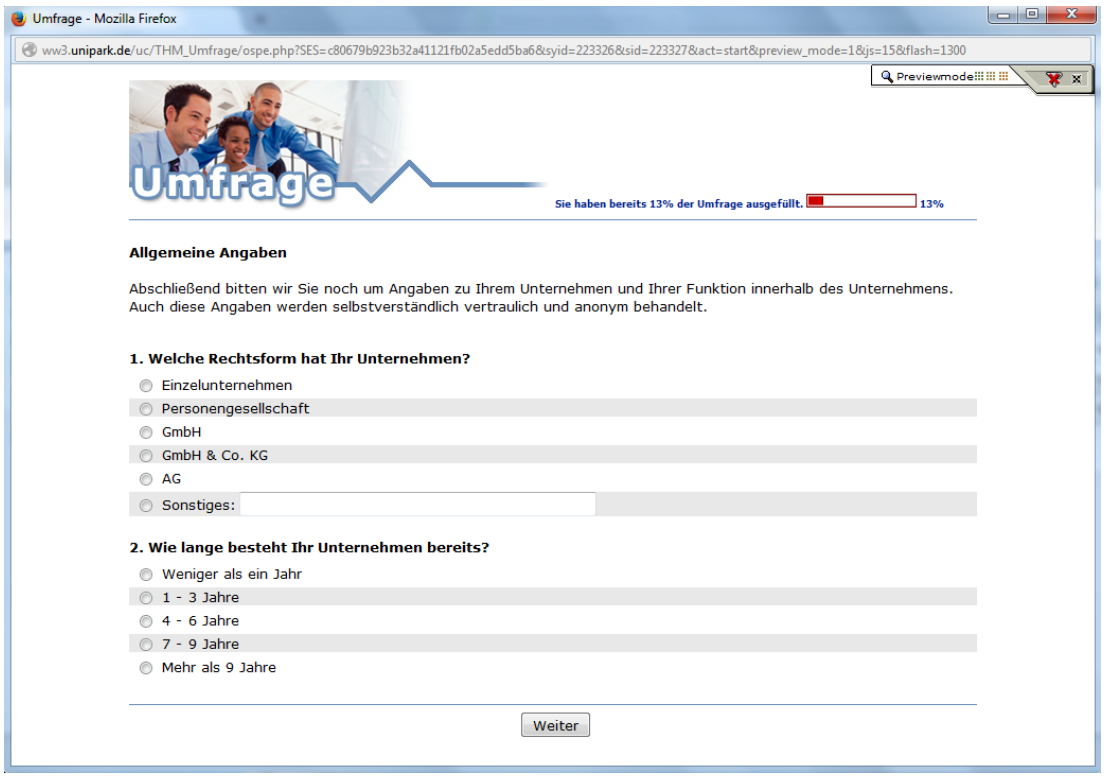
   Never ○ ○ ○ ○ Very often



4. How often do you provide the following information to your bank?

	Annual	Biannual	Quarterly	Monthly	Never
Annual accounts	○	○	○	○	○
Business assessment	○	○	○	○	○
Liquidity details	○	○	○	○	○
Investment planning	○	○	○	○	○
Capital budgeting	○	○	○	○	○
Information about business strategy	○	○	○	○	○
Information about risk management	○	○	○	○	○
Information about human resource management	○	○	○	○	○
Information about order of succession	○	○	○	○	○

5. **Please state your bank:**
    - o Savings Bank
    - o Cooperative
    - o Private bank
    - o Other:

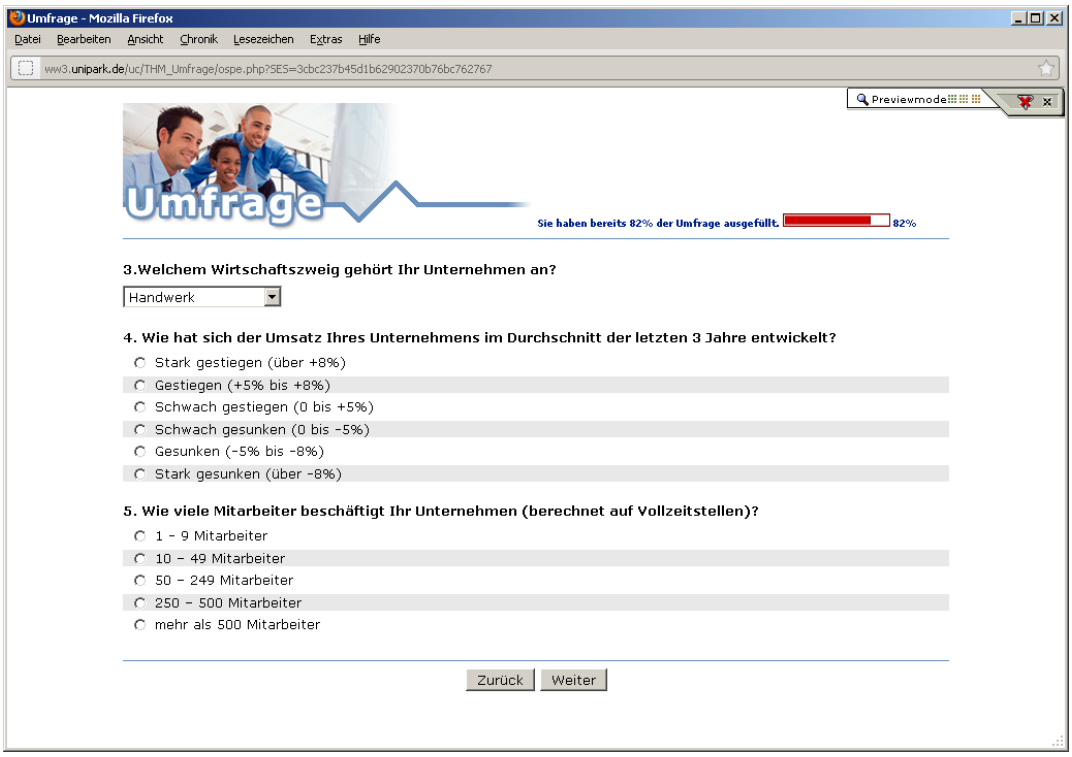


Part IV: General information about the firm

Conclusively, we want to ask you about general information about your firm. We will treat these information as confidential.

1. **Please state the legal form of your firm:**
    - o Sole proprietorship
    - o Partnership
    - o GmbH (Limited company)
    - o GmbH & Co. KG (Limited partnership with a limited company as general partner)
    - o AG (Public limited company)
    - o Other:

2. **How old is your company?**
    - o Less than one year
    - o 1 – 3 years
    - o 4 – 6 years
    - o 6 – 9 years
    - o More than 9 years



3. To which industrial sector does your firm belong?

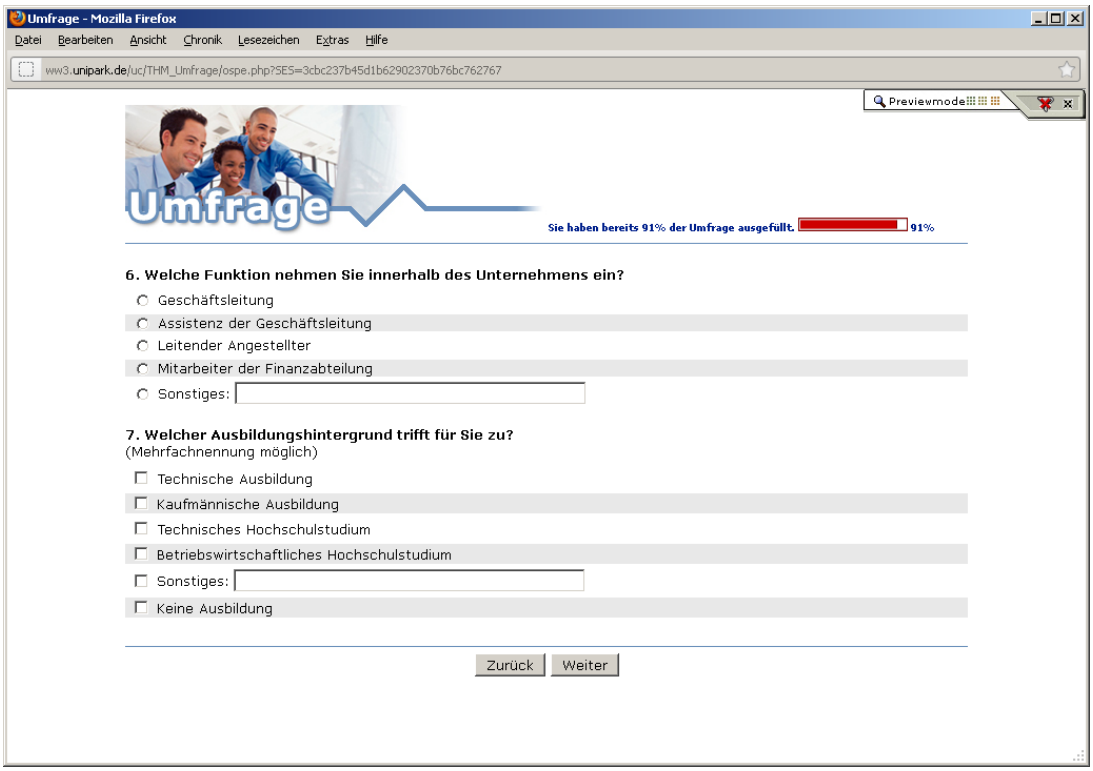
- o Trade industry
- o Retail industry
- o Gardening
- o Manufacture
- o Hospitality industry
- o Other trade
- o Freelance professionals
- o Services
- o Wholesale and foreign trade

4. Please classify the average turnover of your firm within the last three years:

- o Heavily increased (more than +8 per cent)
- o Increased (between +5 and +8 per cent)
- o Slightly increased (0 to +5 per cent)
- o Slightly decreased(0 to -5 per cent)
- o Decreased (between -5 and -8 per cent)
- o Heavily decreased (more than -8 per cent)

5. How many employees does your firm have:

- o 1 – 9 employees
- o 10 – 49 employees
- o 50 – 249 employees
- o 250 – 500 employees
- o more than 500 employees



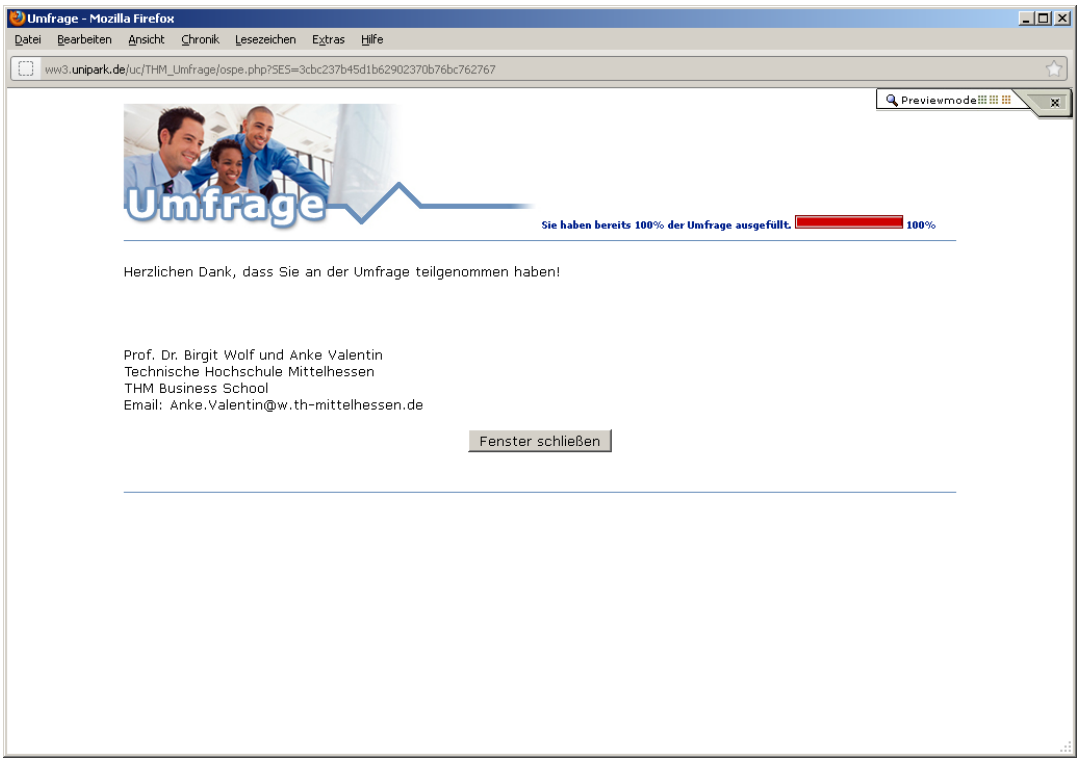
6. Please state your own position within the firm:

- Executive board
- Assistant executive board
- Executive employee
- Employee financial department
- Other:

7. Please state your qualification:

(Multiple selection allowed)

- Technical training
- Business management training
- Technical studies
- Business studies
- Other:
- No qualification



Thank you for your participation!

Prof. Dr. Birgit Wolf and Anke Valentin
Technische Hochschule Mittelhessen
THM Business School
Email: Anke.Valentin@w.th-mittelhessen.de

Appendix II: Cover letter

This appendix consists of the cover letter send out in May 2011 to invite SMEs to attend the research by answering the questionnaire. A rough translation is attached.

THM | CAMPUS GIESSEN
TECHNISCHE HOCHSCHULE MITTELHESSEN

BÜRGSCHAFTSBANK HESSEN

Ansprechpartner:
Herr Schwarz
☎ 0611/1507-26

Mai 2011

Sehr geehrte Damen und Herren,

wir wenden uns heute an Sie mit der Bitte um Unterstützung für ein sehr interessantes Forschungsprojekt, das die Technische Hochschule Mittelhessen (THM) in Kooperation mit der Bürgschaftsbank Hessen durchführt:

Im Rahmen ihrer Promotion untersucht Frau Anke Valentin, wissenschaftliche Mitarbeiterin am Fachbereich Wirtschaft der THM in Gießen, den Einfluss von Bürgschaftsbanken auf den Zugang zu Bankkrediten von kleinen und mittleren Unternehmen. Ziel der Untersuchung ist es, herauszufinden, inwieweit das Bürgschaftsinstrument die Geschäftsbeziehung zur Bank beeinflusst und dadurch der zukünftige Kreditzugang verbessert werden kann. Wesentlicher Bestandteil der Arbeit ist die empirische Untersuchung der Fragestellung aus Sicht der beteiligten Parteien und hier besonders der Unternehmen. Vor diesem Hintergrund möchten wir alle Unternehmen, die zwischen 2003 und 2008 eine Bürgschaft der Bürgschaftsbank Hessen erhalten haben, zu ihren Erfahrungen anhand eines an der THM entwickelten, standardisierten Fragebogens befragen. Ihre als Kunde der Bürgschaftsbank Hessen gesammelten Erfahrungen und Eindrücke sind somit für die beschriebene Erhebung von herausragender Bedeutung. Wir möchten Sie deshalb ganz herzlich bitten, uns zehn Minuten Ihrer Zeit zu widmen und den im Internet verfügbaren Fragebogen auszufüllen.

Den Link zu dem Fragebogen finden Sie auf der Homepage der Bürgschaftsbank Hessen in der Kopfzeile: http://www.bb-h.de/ . Um zu dem Fragebogen zu gelangen, geben Sie bitte das allgemeine Passwort **Umfrage_THM** ein. Ihre Antworten erfolgen anonym und werden selbstverständlich streng vertraulich behandelt.

Wir bedanken uns ganz herzlich für Ihre freundliche Unterstützung. Sollten Sie Interesse an den Ergebnissen der Untersuchung haben, senden Sie bitte eine Email an Anke.Valentin@w.th-mittelhessen.de.

Mit freundlichen Grüßen

Bürgschaftsbank Hessen GmbH

Schwarz Kadau

Bürgschaftsbank Hessen GmbH
Postfach 37 07, 65027 Wiesbaden
Abraham-Lincoln-Straße 38–42, 65189 Wiesbaden
Registergericht: Amtsgericht Wiesbaden HRB 8267
Ust-Nr.: 040 229 86838, FA Wiesbaden
Deutsche Bank AG, Wiesbaden
BLZ 510 700 21, Kto.-Nr. 8 108 722
IBAN: DE 67 51070021 0810872200
BIC: DEUTDEFF510

Telefon: +49 (0) 6 11/15 07-0
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E-Mail: info@bb-h.de
Internet: www.bb-h.de
Nassauische Sparkasse, Wiesbaden
BLZ 510 500 15, Kto.-Nr. 100 018 616
IBAN: DE 54 51050015 0100018616
BIC: NASSDE55

Vorsitzender des Aufsichtsrates:
Volker Fasbender
Geschäftsführung:
Norbert Kadau, Michael Schwarz
Wiesbadener Volksbank e. G., Wiesbaden
BLZ 510 900 00, Kto.-Nr. 504 408
IBAN: DE 22 51090000 0000504408
BIC: WIBADE5W

Dear Sir or Madam,

Today, we contact you to ask for your assistance with a very interesting research project which is conducted by the Technische Hochschule Mittelhessen in cooperation with the guarantee bank Hesse.

As part of her PhD thesis, Anke Valentin is evaluating the impact of the guarantee bank on SME access to bank finance. The aim is to find out to what extent the guarantee bank can facilitate the access to bank finance for SMEs. The main part of the research is the empirical evaluation of the experiences of SMEs. Therefore, we would like to ask all firms that have received a guarantee from guarantee bank Hesse between 2003 and 2008 to answer an online questionnaire. Your experiences as a customer of the guarantee bank Hesse are of great importance for this research project. For this reason, we sincerely ask you to spend ten minutes of your time to complete the questionnaire which is available online at our webpage.

You can find the link directly in the header of our webpage http://www.bb-h.de/. To get access to the questionnaire, please insert the password **Umfrage_THM**. We ensure your anonymity; all answers will be treated confidentially.

We thank you for your kind support. If you are interested in the research results, please contact Anke Valentin (anke.valentin@w.thm.de).

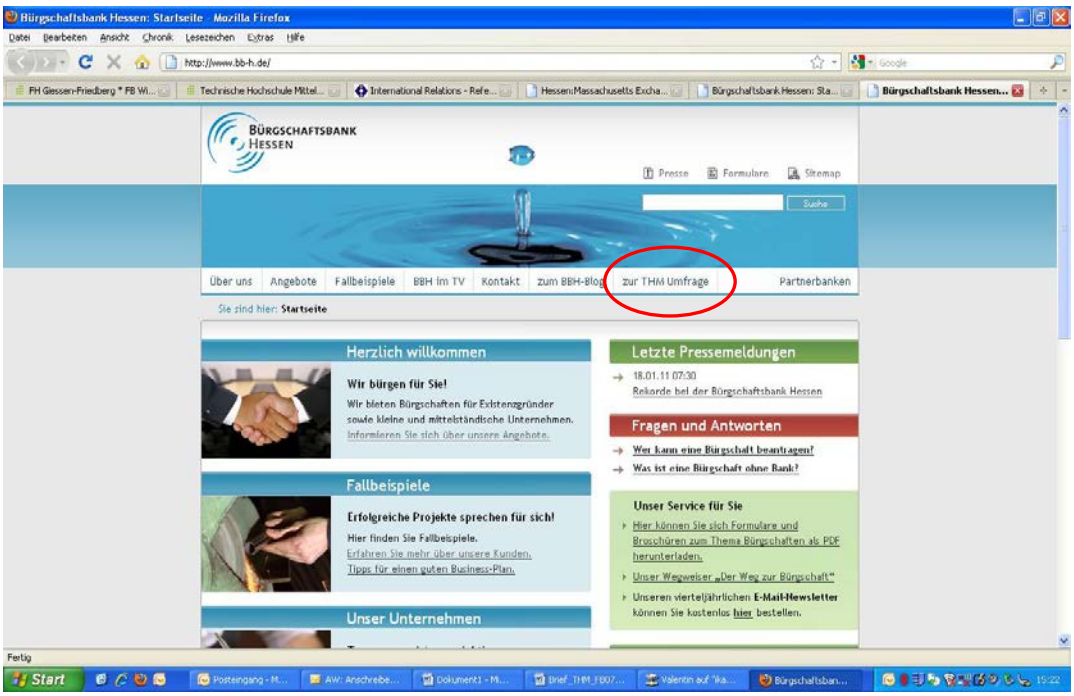
With kind regards

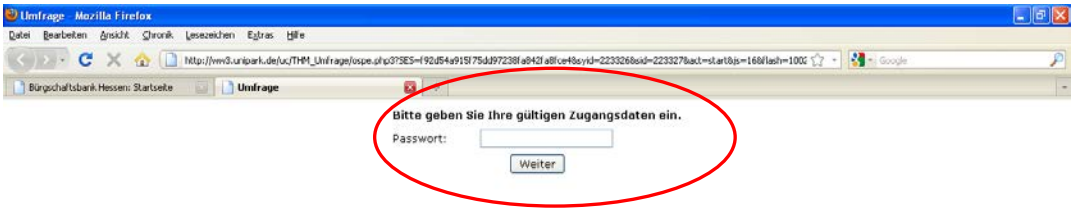
Guarantee Bank HessenGmbH

Schwarz Kadau

Appendix III: Screen shots web survey

This appendix presents a screenshot of the web page of the guarantee bank Hessen showing the link to the web survey and a screenshot of the following page that required the input of the password.





Appendix IV: Follow-up letter

This appendix consists of the follow-up letter that was sent out in June 2011 to all potential respondents of the web survey. A rough Translation is attached.

THM | CAMPUS GIESSEN
TECHNISCHE HOCHSCHULE MITTELHESSEN

BÜRGSCHAFTSBANK HESSEN

Ansprechpartner:
Herr Schwarz
☎ 0611/1507-26

Juni 2011

Sehr geehrte Damen und Herren,

wir hatten Sie im Mai angeschrieben und um Unterstützung für ein Forschungsprojekt der Technische Hochschule Mittelhessen (THM), das in Kooperation mit uns durchgeführt wird, gebeten. Vielleicht haben Sie unser Schreiben übersehen oder keine Zeit für die Beantwortung gefunden – deswegen möchten wir Ihnen das besonders für mittelständische Unternehmen interessante Projekt noch einmal vorstellen:

Im Rahmen ihrer Promotion untersucht Frau Anke Valentin, wissenschaftliche Mitarbeiterin am Fachbereich Wirtschaft der THM in Gießen, den Einfluss von Bürgschaftsbanken auf den Zugang zu Bankkrediten von kleinen und mittleren Unternehmen. Ziel dieser Studie ist es, den Kreditzugang kleiner und mittlerer Unternehmen nachhaltig zu verbessern. Dieses Ziel kann jedoch nur erreicht werden, wenn Sie als Unternehmen Ihre Erfahrungen und Eindrücke äußern. Wir möchten Sie deshalb ganz herzlich bitten, uns maximal zehn Minuten Ihrer Zeit zu widmen und den im Internet verfügbaren Fragebogen auszufüllen. Ohne Ihre Antworten wird es nicht möglich sein, Potentiale zur Verbesserung des Kreditzugangs zu erkennen und auszuschöpfen.

Den Link zu dem Fragebogen finden Sie auf der Homepage der Bürgschaftsbank Hessen in der Kopfzeile: http://www.bb-h.de/ . Um zu dem Fragebogen zu gelangen, geben Sie bitte das allgemeine Passwort **Umfrage_THM** ein. Ihre Antworten erfolgen anonym und werden selbstverständlich streng vertraulich behandelt. Wir möchten Sie bitten, den Fragbogen bis spätestens 22. Juni auszufüllen.
Unter den ersten 30 Antworten verlosen wir 10 Gutscheine von Amazon.de über je 25,00 Euro. Um an der Verlosung teilnehmen zu können, senden Sie bitte, nachdem Sie den Fragebogen vollständig ausgefüllt haben, eine Email an Susanne.Weber@w.th-mittelhessen.de. Sollten Sie den Fragebogen bereits beantwortet haben, können Sie die Email gerne nachträglich senden.

Wir bedanken uns ganz herzlich für Ihre Mithilfe und verbleiben

Mit freundlichen Grüßen

Bürgschaftsbank Hessen GmbH

Schwarz Kadau

Bürgschaftsbank Hessen GmbH
Postfach 37 07, 65027 Wiesbaden
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Volker Fasbender
Geschäftsführung:
Norbert Kadau, Michael Schwarz
Wiesbadener Volksbank e. G., Wiesbaden
BLZ 510 900 00, Kto.-Nr. 504 408
IBAN: DE 22 51090000 0000504408
BIC: WIBADE5W

Dear Sir or Madam,

We contacted you in May to ask for your assistance with a very interesting research project conducted by the Technische Hochschule Mittelhessen in cooperation with the guarantee bank Hessen. You may have not yet found the time to answer the questionnaire. Therefore, we would like to introduce the research project, which is of special interest for SMEs, again.

As part of her PhD thesis, Anke Valentin is evaluating the impact of the guarantee bank on SME access to bank finance. The aim is to find out to what extent the guarantee bank can facilitate the access to bank finance for SMEs. The main part of the research is the empirical evaluation of the experiences of SMEs. Therefore, we would like to ask all firms that have received a guarantee from guarantee bank Hessn between 2003 and 2008 to answer an online questionnaire. Your experiences as a customer of the guarantee bank Hesse are of great importance for this research project. For this reason, we sincerely ask you to spend ten minutes of your time to complete the questionnaire which is available online at our webpage.

You can find the link directly in the header of our webpage http://www.bb-h.de/. To get access to the questionnaire, please insert the password **Umfrage_THM**. We ensure your anonymity; all answers will be treated confidentially. Please fill in the questionnaire before 22 June 2011. The first 30 respondents will participate in a lottery for 10 vouchers for Amazon.de each worth 25.00 euros. To take part in the lottery, please send an email to Susanne.Weber@w.thm.de after completing the questionnaire. If you have already answered the questionnaire, you are also invited to take part in the lottery.

We thank you in advance for your support.

With kind regards

Guarantee bank Hesse GmbH

Schwarz Kadau

Appendix V: Results of the non-response bias tests

This appendix consists of the results of the chi-square tests for each question of the web survey for testing significant differences of the early and late respondents.

P I, Q 1 **Access to bank loans**

Chi-square test	N	χ 2	df	p	Sig.
	156	2.811	4	0.590	-

P II, Q 1 **Purpose of the loan**

Chi-square test	N	χ 2	df	p	Sig.
Investment	157	0.001	1	1.000	-
Working capital	157	0.164	1	0.715	-
Start-up	157	1.409	1	0.307	-
Other	157	2.013	1	0.222	-

P II, Q 2 **P II, Q 2: Initiative for including guarantee**

Chi-square test	N	χ 2	df	p	Sig.
	157	4.061	3	0.255	-

P II, Q 3a **Knowledge bank about guarantee bank** (multiple selection allowed)

Chi-square test	N	χ 2	df	p	Sig.
	157	3.530	4	0.473	-

P II, Q 3b **Requirements guarantee bank**

Chi-square test	N	χ 2	df	p	Sig.
	157	1.392	4	0.846	-

P II, Q 3c **Amount information provided**

Chi-square test	N	χ 2	df	p	Sig.
	147	2.760	3	0.430	-

P II, Q 3d **Regularity information provided**

Chi-square test	N	χ 2	df	p	Sig.
	145	2.336	3	0.506	-

P II, Q 3e **Meaning guarantee**

Chi-square test	N	χ 2	df	p	Sig.
	147	5.052	3	0.168	-

P II, Q 3f **Relationship after receiving guarantee**

Chi-square test	N	χ 2	df	p	Sig.
	147	1.224	3	0.747	-

P II, Q 4	**Need for follow-up loan**					
	Chi-square test	N	χ 2	df	p	Sig.
		152	0.382	1	0.529	-

P II, Q 5	**Need for follow-up guarantee**					
	Chi-square test	N	χ 2	df	p	Sig.
		61	3.494	1	0.069	<0.1

P III, Q 1	**Duration relationship bank when applying for the loan**					
	Chi-square test	N	χ 2	df	p	Sig.
		152	3.589	3	0.309	-

P III, Q 2	**Contact frequency with bank**					
	Chi-square test	N	χ 2	df	p	Sig.
		152	0.736	3	0.865	-

P III, Q 3	**Changes of the contact person in the past**					
	Chi-square test	N	χ 2	df	p	Sig.
		149	3.977	3	0.264	-

P III, Q 4	**Provision of information**					
	Chi-square test	N	χ 2	df	p	Sig.
	Annual accounts	157	1.657	4	0.798	-
	Business assessment	157	1.247	5	0.940	-
	Liquidity planning	157	0.976	5	0.964	-
	Investment planning	157	4.781	5	0.443	-
	Capital budgeting	157	0.984	5	0.964	-
	Business strategy	157	1.184	5	0.946	-
	Risk management	157	6.463	5	0.264	-
	HRM	157	6.635	5	0.249	-
	Order of succession	157	0.535	3	0.911	

P III, Q 5	**Bank type**					
	Chi-square test	N	χ 2	df	p	Sig.
		157	1.963	4	0.743	-

P IV, Q 1	**Legal form**					
	Chi-square test	N	χ 2	df	p	Sig.
		157	1.100	6	0.982	-

P IV, Q 2	**Age of the firm**					
	Chi-square test	N	χ 2	df	p	Sig.
		157	4.641	4	0.326	-

P IV, Q 3 **Industrial sector**

Chi-square test	N	χ 2	df	p	Sig.
	157	7.482	8	0.486	-

P IV, Q 4 **Development turnover within the past three years**

Chi-square test	N	χ 2	df	p	Sig.
	151	10.043	5	0.074	<0.1

P IV, Q 5 **Headcount**

Chi-square test	N	χ 2	df	p	Sig.
	157	3.003	4	0.557	-

P IV, Q 6 **Position within the firm**

Chi-square test	N	χ 2	df	p	Sig.
	157	12.960	5	0.024	<0.05

P IV, Q 7 **Qualification** (multiple selection allowed)

Chi-square test	N	χ 2	df	p	Sig.
Technical training	157	2.890	1	0.111	-
Business management training	157	0.087	1	0.864	-
Technical studies	157	0.028	1	1.000	-
Business studies	157	1.887	1	0.183	-
No qualification	157	1.887	1	0.183	-

Appendix VI: Variables and scales

This appendix presents the variables used for statistical analysis and its corresponding question within the online questionnaire as well as its scales.

Question	Scale
Part I: How severe are the difficulties for SMEs to obtain bank loans according to your estimation?	Interval
Part II, Q 1: For which purpose did you apply for a bank loan?	Nominal
Part II, Q 2: Why have a guarantee been integrated in the loan?	Nominal
Part II, Q 3a: My bank officer was comprehensively informed about the business activities of the guarantee bank and the application process.	Interval
Part II, Q 3b: The guarantee bank required more resp. more detailed information about my firm than the bank.	Interval
Part II. Q 3c: Since I have received the guaranteed loan I provide more information about my business to my bank.	Interval
Part II, Q 3d: Since I have received the guaranteed loan I provide more regular information about my business to my bank.	Interval
Part II, Q 3e: The guarantee was crucial for obtaining the loan.	Interval
Part II, Q 3f: The relationship to my bank has intensified since I have received the guaranteed loan.	Interval
Part II, Q 4: Have you applied for another bank loan after receiving the guarantee of the guarantee bank?	Nominal
Part II, Q5: Did you need a guarantee of the guarantee bank for obtaining the loan again?	Nominal
Part III, Q1: How long did the relationship to your bank already exist when you applied for the loan?	Ordinal
Part III, Q 2: How often have you been in touch with your bank within the past?	Ordinal
Part III, Q 3: How often did your contact person in the bank change in the past?	Ordinal
Part III, Q 4: How often do you provide the following information to your bank?	Ordinal
Part III, Q 5: Please state your bank**.**	Nominal
Part IV, Q 1: Please state the legal form of your firm.	Nominal
Part IV, Q 2: How old is your company?	Ordinal
Part IV, Q 3: To which industrial sector does your firm belong?	Nominal
Part IV, Q 4: Please classify the average turnover of your firm within the last three years.	Ordinal
Part IV, Q 5: How many employees does your firm have?	Ordinal
Part IV, Q 6: Please state your own position within the firm.	Nominal
Part IV, Q 7: Please state your qualification.	Nominal

The distances of the variables of P III, Q 3 a – f were considered to be equal. Therefore, these variables were treated as interval variables (Porst, 2009).

Appendix VII: Interview guide

This appendix consists of the guideline for the semi-structured interviews that have been conducted with bank managers.

Part A: Rationales for insisting on a guarantee

1. When do you insist on the inclusion of a guarantee from the guarantee bank?

2. Why facilitates the guarantee the provision of the loan?

3. Why do sometimes even existing customers and established firms need a guarantee from a guarantee bank? How does the duration of the existing lending relationship influence the access to bank loans?

4. What happens if the guarantee bank rejects the provision of the guarantee? Will the loan be provided anyway? Under which conditions?

5. Are there any exclusion criteria that impede the provision of a loan to a SME even when a guarantee from the guarantee bank is included? Which?

Part B: Information

6. Which information are particularly important for the loan decision?

7. Does the bank receive more information or more regular information about the borrower due to the provision of the guarantee? Which? Why? How valuable are these information?

8. Is it possible to collect additional information about the borrower or firm in the course of the credit period? (If not: Why do some SMES state that they have provided more information or more regular information?)

9. What can you tell me about the credit scoring of SMEs?

Part C: Lending Relationship

10. Can long-lasting bank-borrower relationships be established due to the provision of the guarantee which haven´t been established otherwise?

11. Does the lending relationship become more intense due to the provision of the guarantee?

12. Is there a difference in the contact frequency between borrowers that received a guarantee from the guarantee bank and those that did not receive a guarantee?

Part D: Credit restrictions

13. Can credit restrictions be mitigated by the existence of guarantee banks?
14. Facilitates the provision of a guarantee from a guarantee bank the provision of a follow-up loan?

Part E: Costs

15. How would you explain the influence of the inclusion of a guarantee from the guarantee bank on the overall profit of a SME loan?
16. What is about the potential reduction of equity requirements related to the inclusion of a guarantee? Is this decisive for making the decision to include a guarantee?
17. How important is the cross-selling potential in respect of the inclusion of a guarantee?
18. How important is the support of the region in respect of the inclusion of a guarantee?
19. How many loans with guarantee of a guarantee bank are in default (compared to loans without guarantee)?

According to your opinion and experience, are there any important aspects that should be considered additionally?

Notes:

Position if the interviewee (years of working experiences?):

Bank:

Amount of customers:

Duration of the interview:

Appendix VIII: Frequency distribution of variables

This appendix consists of frequency distributions of the answers to those questions that have not been illustrated in the sections of the statistical analysis.

Part II, Q 2: Why have a guarantee been integrated in the loan?

No statement	7	4.5%
Bank required guarantee	98	62.4%
SME received a guarantee in advance	19	12.1%
SME asked about including guarantee	33	21.0%
Total	157	100.0%

Filter Question: Where did you know the services of the guarantee bank from?

(Multiple selection allowed)

Internet	10	12.7%
Newspaper/Radio/TV	2	2.5%
Chamber of Industry and Commerce	11	13.9%
Chamber of Trade	7	8.9%
Management Consultant	18	22.8%
Tax accountant	11	13.9%
Friends	14	17.7%
Other	6	7.6%
Total	79	100.0%

Part II, Q 3a: My bank officer was comprehensively informed about the business activities of the guarantee bank and the application process.

No statement	7	4.5%
I absolutely agree	69	43.9%
I rather agree	52	33.1%
I rather not agree	26	16.6%
I absolutely not agree	3	1.9%
Total	157	100.0%

P II, Q 3b: The guarantee bank required more resp. more detailed information about my firm than the bank.

No statement	8	5.1%
I absolutely agree	35	22.3%
I rather agree	45	28.7%
I rather not agree	59	37.6%
I absolutely not agree	10	6.7%
Total	157	100.0%

P IV, Q 4: Please classify the average turnover of your firm within the last three years:

No statement	6	3.8%
Heavily increased (more than +8%)	46	29.3%
Increased (between +5% and +8%)	39	24.8%
Slightly increased (0% to +5%)	35	22.3%
Slightly decreased (0% to -5%)	15	9.6%
Decreased (between -5% and -8%)	8	5.1%
Heavily decreased (more than -8%)	8	5.1%
Total	157	100.0%

Part IV, Q 6: Please state your own position within the firm:

Executive board	136	86.6%
Assistant executive board	2	1.3%
Executive employee	4	2.5%
Employee financial department	2	1.3%
Other	10	6.4%
Total	154	100.0%

P IV, Q 6: Please classify the average turnover of your firm within the last three years:

Heavily increased (more than +8%)	46	29.3%
Increased (between +5% and +8%)	39	24.8%
Slightly increased (0% to +5%)	35	22.3%
Slightly decreased (0% to -5%)	15	9.6%
Decreased (between -5% and -8%)	8	5.1%
Heavily decreased (more than -8%)	8	5.1%
Total	157	100.0%

Part IV, Q 7: Please state your qualification:

(Multiple selection allowed)

Technical qualification	37	19.7%
Business management training	66	35.1%
Technical studies	16	8.5%
Business studies	27	14.3%
Other	36	19.1%
No qualification	6	3.2%
Total	188	100.0%

Appendix IX: Further analyses of the need for a follow-up guarantee

This appendix consists of the contingency tables and chi-square tests conducted to analyse the relationships between the variable about the need for a follow-up guarantee and some demographic variables. No clear relationship was found. Interestingly, only firms of a legal sector worse than the overall economy needed a follow-up loan. This might be an indicator that banks tend to require an additional security for these sectors. Moreover, especially SMEs from co-operative banks needed a follow-up loan. However, due to the small sample size, no general assumptions can be made out of these results.

Need for a follow-up guarantee (PII, Q5) vs. number of employees (PIV, Q5)

	Employees					
	≤ 9 employees		> 9 employees		Total	
Follow-up guarantee						
Yes	3	9.7%	3	10.3%	6	10.0%
No	28	90.3%	26	89.7%	54	90.0%
Total	31	100.0%	29	100.0%	60	100.0%
χ^2 =0.007; df=1; p=0.931; Sig. ≥0.1						

Need for a follow-up guarantee (PII, Q5) vs. legal form (PIV, Q1)

	Legal form					
	Unlimited liability		Limited liability		Total	
Follow-up guarantee						
Yes	2	8.0%	4	11.8%	6	10.2%
No	23	92.0%	30	88.2%	53	89.8%
Total	25	100.0%	34	100.0%	59	100.0%
χ^2 = .224; df = 1; p = 0.636; Sig. ≥ 0.1						

Need for a follow-up guarantee (PII, Q5) vs. industrial sector (PIV, Q 3)

	Industrial sector					
	Worse solvency		Better solvency		Total	
Follow-up guarantee						
Yes	6	12.2%	0	0.0%	6	9.8%
No	43	87.8%	12	100.0%	55	90.2%
Total	49	100.0%	12	100.0%	61	100.0%
χ^2 = 1.630; df = 1; p = 0.202; Sig. ≥ 0.1						

Need for a follow-up guarantee (PII, Q5) vs. age of the firm (PIV, Q2)

	Age of the firm							
	0-3 years		4-9 years		More than 9 years		Total	
Follow-up guarantee								
Yes	1	20.0%	2	7.7%	3	10.3%	6	9.8%
No	4	80.0%	24	92.3%	26	89.7%	54	90.2%
Total	5	100.0%	26	100.0%	29	100.0%	60	100.0%

$\chi^2 = 0.713$; df = 2; p = 0.700; Sig. ≥ 0.1

Need for a follow-up guarantee (PII, Q5) vs. bank (PIII, Q5)

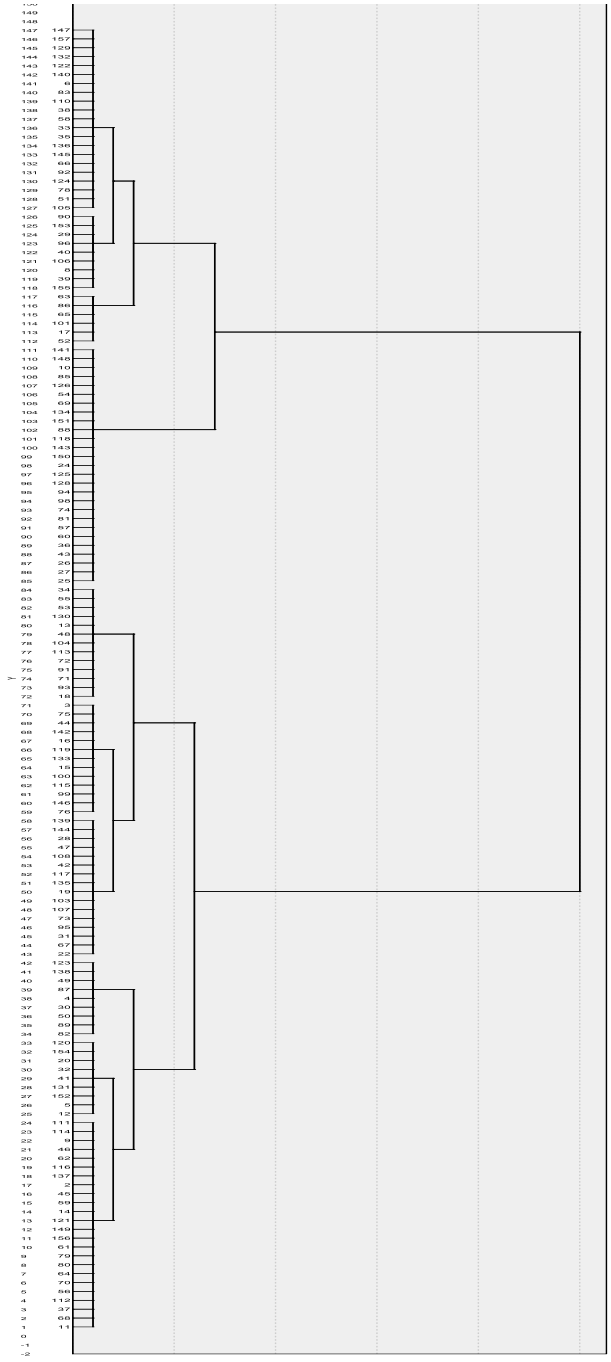
	Bank							
	Savings bank		Co-operative bank		Private bank		Total	
Follow-up guarantee								
Yes	1	4.3%	5	15.2%	0	0.0%	6	10.2%
No	22	95.7%	28	84.8%	3	100.0%	53	89.8%
Total	23	100.0%	33	100.0%	3	100.0%	59	100.0%

$\chi^2 = 2.090$; df = 2; p = 0.351; Sig. ≥ 0.1

Appendix X: Hierarchical clustering results

This appendix contains the dendrogram of the hierarchical clustering results.

Dendrogram of cases using Ward´s method



References

Abernethy, M. A., W. F. Chua, P. F. Luckett, and F. H. Selto. 1999. Research in managerial accounting: Learning from other´s experiences. *Accounting and Finance* 39 (1):1 - 27.

Akerlof, G. A. 1970. The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84 (3):488 - 500.

Arend, J., and V. Zimmermann. 2009. Innovationshemmnisse bei kleinen und mittleren Unternehmen [Innovation Constraints for SMEs]. In *Mittelstands- und Strukturpolitik No. 43*, edited by Kreditanstalt für Wiederaufbau, [reconstruction loan corporation]. Frankfurt/Main, 57 - 95.

Association of German Guarantee Banks. 2012. [Zukunft sichern - Die deutsche Bürgschaftsbanken] Safe Future - The German Guarantee Banks Berlin.

Astebro, T., and I. Bernhardt. 1999. Bank Loans as Predictors of Small Business Start-up survival. Canada: Department of Management Sciences. University of Waterloo,.

Bartholomew, S., and A. D. Smith. 2006. Improving Survey Response Rates from Chief Executive Officers in Small Firms: The Importance of Social Networks. *Entrepreneurship: Theory and Practice* 30 (1):83 - 96.

Bauer, A., and V. Zimmermann. 2010. Unternehmensbefragung 2010 [Survey of enterprises 2010], edited by Kreditanstalt für Wiederaufbau [Reconstruction loan coprporation]. Frankfurt/Main.

Beck, T., and A. Demirguc-Kunt. 2006. Small and medium-sized enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance* 30 (11):2931 - 2943.

Beck, T., L. F. Klapper, and J. C. Mendoza. 2010. The typology of partial credit guarantee funds around the world. *Journal of Financial Stability* 6 (1):10 - 25.

Becker, H. P., and A. Peppmeier. 2013. *Bankbetriebslehre [Banking Management]*. Vol. 9. Herne: kiehl.

Becker, W., and P. Ulrich. 2009a. Mittelstand, KMU und Familienunternehmen in der Betriebswirtschaftslehre [Mittelstand, SME and Family Firms in Business Administration]. *Wirtschafts Wissenschaften* Januar 2009.

———. 2009b. Spezifika des Controllings im Mittelstand - Ergebnisse einer Interviewaktion [Specifics in controlling of SMEs - Results of an interview campaign]. *Controlling & Management* 53 (5):308 - 316.

Becker, W., P. Ulrich, T. Botzkowski, M. Vogt, and L. Zimmermann. 2013. Aktuelle Tendenzen der Kreditfinanzierung im Mittelstand [Current trends in loan financing of SMEs]. In *Bamberger Betriebswirtschaftliche Beiträge 186*, edited by University of Bamberg. Bamberg.

Behr, P., A. Entzian, and A. Güttler. 2011. How do lending relationships affect access to credit and loan conditions in microlending? *Journal of Banking & Finance* 35 (8):2169 - 2178.

Behr, P., and A. Guettler. 2007. Credit Risk Assessment and Relationship Lending: An Empirical Analysis of German Small and Medium-Sized Enterprises. *Journal of Small Business Management* 45 (2):194 - 213.

Benavides, G., and A. Huidobro. 2008. Are Loan Guarantees Effective? The Case of Mexican Government Banks. In *Conference paper presented at Partial Credit*

Guarantee Schemes - Experiances and Lessons, edited by The World Bank. Washington, D.C.

Berger, A. N., M. A. Espinosa-Vega, W. S. Frame, and N. H. Miller. 2011a. Why do borrowers pledge collateral? New empirical evidence on the role of asymmetric information. *Journal of Financial Intermediation* 20 (1):55 - 70.

Berger, A. N., W. S. Frame, and V. Ioannidou. 2011b. Tests of ex ante versus ex post theories of collateral using private and public information. *Journal of Financial Economics* 100 (1):85 - 97.

Berger, A. N., and G. F. Udell. 1990. Collateral, Loan Quality, and Bank Risk. *Journal of Monetary Economics* 25:21 - 42.

———. 1995. Relationship lending and lines of credit in small firm finance. *Journal of Business* 68 (3):351 - 381.

———. 1998. The economics of small business finance: The roles of private equity and debt markets on the financial growth cycle. *Journal of Banking & Finance* 22 (6 - 8):613 - 673.

———. 2002. Small Business Credit Availability and Relationship Lending: The Importance of Bank Onganisational Structure. *The Economic Journal* 112 (2):F32 - F53.

Besanko, D., and A. V. Thakor. 1987. Collateral and Rationing: Sorting Equilibria in Monopolistic and Competitive Credit Markets. *International Economic Review* 28 (3):671 - 689.

Bester, H. 1985. Screening vs. Rationing in Credit Markets with Imperfect Information. *The American Econimic Review* 75 (4):850 - 855.

Bitektine, A. 2008. Prospective case study design: Qualitative method for deductive theory testing. *Organizational Research Methods* 11 (1):160 - 180.

Boocock, G., and M. N. M. Shariff. 2005. Measuring the Effectiveness of Credit Guarantee Schemes: Evidence from Malaysia. *International Small Business Journal* 23 (4):427-454.

Bösch, M. 2009. *Finanzwirtschaft [Financial Economy]*. Munich: Vahlen.

Bosse, D. A. 2009. Bundling governance mechanisms to efficiently organize small firm loans. *Journal of Business Venturing* 24 (2):183 - 195.

Bradshaw, T. K. 2002. The Contribution of Small Business Loan Guarantees to Economic Development. *Economic Development Quarterly* 16 (4):360 - 369.

Brosius, F. 2006. *SPSS 14*. Heidelberg: mitp.

Brost, H., A. Dahmen, and I. Lippmann. 2008. *Corporate Banking*. 6 ed. Frankfurt/Main: Frankfurt School Verlag.

Bryman, A. 2006. Integrating quantitative and qualitative research: how is it done? *Qualitative Research* 6 (1):97 - 113.

———. 2007. Barriers to Integrating Quantitative and Qualitative Research. *Journal of Mixed Methods Research* 1 (1):8 - 22.

Bryman, A., and E. Bell, eds. 2007. *Busienss research methods*. 2nd ed. Oxford, New York: Oxford University Press.

Bryman, A., and D. Cramer. 2009. *Quantitative Data Analysis with SPSS 14, 15 & 16*. East Sussex: Routledge.

Bühl, A. 2008. *SPSS 16*. Vol. 11. München: Pearson.

Cameron, R. 2011. Mixed Methods Research: The Five Ps Framework. *The Electronic Journal of Business Research Methods* 9 (2):96 - 108.

Camino, D., and C. Cardone. 1999. The Valuation and Cost of Credit Insurance Schemes for SMEs: The Role of the Loan Guarantee Associations. *International Small Business Journal* 17 (4):13 - 31.

Cho, H., and R. LaRose. 1999. Privacy Issues in Internet Surveys. *Social Science Computer Review* 17 (4):421 - 434.

Church, A. H. 1993. Estimating the effect of incentives on mail survey response rates: A meta-analysis. *Public Opinion Quarterly* 57 (1):62 - 79.

Coco, G. 2000. On The Use of Collateral. *Journal of Economic Surveys* 14 (2):191 - 214.

Cole, R. A. 1998. The importance of relationships to the availability of credit. *Journal of Banking & Finance* 22 (6 - 8):959 - 977.

Colombo, M. G., and L. Grilli. 2007. Funding Gaps? Access to Bank Loans by High-Tech Start-Ups. *Small Business Economics* 29 (1-2):25 - 46.

Columba, F., L. Gambacorta, and P. E. Mistrulli. 2010. Mutual guarantee institutions and small business finance. *Journal of Financial Stability* 6 (1):45 - 54.

Cowling, M. 2010. The role of loan guarantee schemes in alleviating credit rationing in the UK. *Journal of Financial Stability* 6 (1):36 - 44.

Cowling, M., and P. Mitchell. 2003. Is the Small Firms Loan Guarantee Scheme Hazardous for Banks or Helpful to Small Business? *Small Business Economics* 21 (1):63 - 71.

Craig, B. R., W. E. Jackson III, and J. B. Thomson. 2008. Credit market failure intervention: Do government sponsored small business credit programs enrich poorer areas? *Small Business Economics* 30 (4):345 - 360.

Craig, B. R., W. E. Jackson III, and J. B. Thomson. 2009. The Economic Impact of the Small Business Administration´s Intervention in the Small Firm Credit Market: A Review of the Research Literature. *Journal of Small Business Management* 47 (2):221 - 231.

Creditreform. 2009. Wirtschaftslage und Finanzierung im Mittelstand [Economic Climate and Financing in Mittelstand]. Neuss.

———. 2010. Die Krise als Stresstest - zur Bönität deutscher Unternehmen [The crisis being a stress test - on the creditworthiness of German firms]. Neuss.

———. 2012. Insolvenzen in Deutschland - 1. Halbjahr 2012 [Insolvencies in Germany - 1st half year 2012]. Neuss.

———. 2013. Wirtschaftslage und Finanzierung im Mittelstand [Economic Situation and Finance in the Mittelstand]. Neuss.

Cressy, R. 2002. Funding Gaps: A Symposium. *The Economic Journal* 112 (477):F1 - F16.

———. 2006. Why do Most Firms Die Young? *Small Business Economics* 26 (2):103 - 116.

Creswell, J. W., and V. L. Plano Clark. 2007. *Designing and conducting mixed methods research*. Thousand Oaks: Sage Publications.

Daldrup, A. 2005. Kreditrisikomaße im Vergleich, edited by Institut für Wirtschaftsinformatik. Göttingen: Georg-August-Universität Göttingen . .

De, D. A. 2005. *Entrepreneurship, Gründung und Wachstum von kleinen und mittleren Unternehmen [Entrepreneurship: Founding and Growth of Small to Medium-Sized Firms]*. München: Pearson Education.

de Meza, D., and D. C. Webb. 1992. Efficient credit rationing. *European Economic Review* 36 (6):1277 - 1290.

Detzer, D., N. Dodig, T. Evans, E. Hein, and H. Herr. 2013. The German Financial System. In *Studies in Financial Systems No 3*. Berlin.

Diamond, D. 1984. Financial intermediation and delegated monitoring. *Review of Economic Studies* 51 (3):393 - 414.

Dolnicar, S., B. Grün, and F. Leisch. 2011. Quick, simple and reliable: forced binary survey questions. *International Journal of Market Research* 53 (2):231 - 252.

Easterby-Smith, M., R. Thorpe, and P. R. Jackson, eds. 2008. *Management Research* 3rd ed. Los Angeles, London, New Dehli, Singapore, Washington D.C.: SAGE Publications.

Elyasiani, E., and L. G. Goldberg. 2004. Relationship lending: a survey of the literature. *Journal of Economics and Business* 56 (4):315 - 330.

European Commission. *The new SME definition - User guide and model declaration* 2006 [cited 14.05.2010. Available from http://ec.europa.eu/enterprise/policies/sme/files/sme_definition/sme_user_guide_en.pdf]

European Mutual Guarantee Association. 2003. Guaranteeing Loans for Small and Medium-Sized Enterprises. Brussels.

———. 2010. Pricing Survey: AECM Members´ Description. Brussels.

Federal Ministry of Economy and Technology. *Evaluierung des erweiterten Bürgschaftsprogramms der Bürgschaftsbanken [Evaluation of the extended guarantee programm of guarantee banks]* 2010 [cited 13 September 2011. Available from http://www.nbb-hannover.de/pdf/BMWi_Buergschaftsprogr_rz_%282%29.pdf].

Feilzer, M. Y. 2010. Doing Mixed Methods Research Pragmatically: Implications for the Rediscovery of Pragmatism as a Research Paradigm. *Journal of Mixed Methods Research* 4 (1):6 - 16.

Fischl, B. 2006. *Alternative Unternehmensfinanzierung für den deutschen Mittelstand [Alternatives in Business Finance for the German Mittelstand]*. Wiesbaden: Deutscher Universitäts Verlag.

Freeman, J. V., and M. J. Campbell. 2007. The Analysis of Categorial Data: Fisher´s Exact Test. *Scope* 16 (18):11 - 12.

Gebotys, R. 1999. Handout on Validity. Canada: Wilfried Laurier University.

Geisen, B., and R. Hebestreit. 2009. Mittelstand: Leistung durch Vielfalt [German Mittelstand: Performance by Diversity], edited by Bundesministerium für Wirtschaft und Technologie [Federal Ministery of Economy and Technology]. Berlin.

German Bundesbank. 2013. Finanzstabilitätsbericht 2013 [Financial Stability Report 2013]. Frankfurt/Main.

———. 2014. Bankenstatistik März 2014 [Banking statistics March 2014]. Frankfurt/Main.

Gilbert, T. 2006. Mixed methods and mixed methodologies. *Journal of Research in Nursing* 11 (3):205 - 217.

Gill, J., and P. Johnson. 2010. *Research Methods for Managers*. 4th ed. London: SAGE Publications Ltd.

Gläser, J., and G. Laudel. 2009. *Experteninterviews und qualitative Inhaltsanalyse [Expert interviews and qualitative content analysis]*. Vol. 3. Wiesbaden: VS Verlag

Goeke, M. 2008. Der deutsche Mittelstand - Herzstück der deutschen Wirtschaft [The German Mittelstand - Heart of the German Economy]. In *Praxishandbuch Mittelstandsfinanzierung [Practical Guide for Financing SMEs]*, edited by M. Goeke. Wiesbaden: Springer.

Goetz, E. G., and M. D. LeCompte. 1984. *Ethnography and wualitative design in education research*. Orlando FL: Academic Press.

Gonas, J. S., M. J. Highfield, and D. J. Mullineaux. 2004. When Are Commercial Loans Secured? *The Financial Review* 39 (1):79 - 99.

Graham, T. 2004. Graham Review of the Small Firms Loan Guarantee, edited by HM Treasury. London.

Green, A. *Credit Guarantee Schemes for Small Enterprises: An Effective Instrument to Promote Private Sector-Led Growth?* UNIDO 2003 [cited 22.10.2009]. Available from http://www.unido.org/file-storage/download/?file_id18223].

Greene, J. C., L. Benjamin, and L. Goodyear. 2001. The Merits of Mixing Methods in Evaluation. *Evaluation* 7 (1):25 - 44.

Grunert, J., and L. Norden. 2012. Bargaining power and information in SME lending. *Small Business Economics* 39 (2):401 - 417.

Guba, E. G., and Y. S. Lincoln. 1982. Epistemological and methodological bases of naturalistic inquiry. *Educational Communication and Technology Journal* 30 (4):233 - 252.

Gudger, M. 1998. Credit Guarantees: An analysis of the state of knowledge and new avenues of research. In *Agricultural Services Bulletin 129*, edited by FAO. Rome.

Günterberg, B. 2012. Unternehmensgrößenstatistik [Enterprise Size Statistics]. In *Daten und Fakten Nr. 2 [Data and Facts No 2]*, edited by Institut für Mittelstandsforschung Bonn. Bonn.

Hackethal, A. 2003. German banks - a declining industry? In *CFS Working Paper No. 2003/27*. Frankfurt/Main: Center for Financial Studies.

Hackethal, A., and F. Gleisner. 2006. Kreditprozesse aus Sicht des Mittelstandes Frankfurt am Main.

Hackethal, A., and R. H. Schmidt. 2005. Structural Change in the German Banking System?, Working Paper Series: Finance & Accounting, Johann Wolfgang Goethe-Universität Frankfurt/Main.

Hall, B., and K. Howard. 2008. Conducting Mixed Methods Research With Typological and Systemic Design Considerations. *Journal of Mixed Methods Research* 2 (3):248 - 269.

Harhoff, D., and T. Körting. 1998. Lending relationships in Germany - Empirical evidence from survey data. *Journal of Banking & Finance* 22 (10 - 11):1317 - 1353.

Hartmann-Wendels, T., A. Pfingsten, and M. Weber, eds. 2007. *Bankbetriebslehre*. 4th ed. Berlin: Springer

Harvey, W. S. 2011. Strategies for conducting elite interviews. *Qualitative Research* 11 (4):431 - 441.

Henson, R. K., and J. K. Roberts. 2006. Use of Exploratory Factor Analysis in Published Research. *Educational and Psychological Measurement* 66 (3):393 - 416.

Hesse-Biber, S. 2010. Qualitative Approaches to Mixed Methods Practice. *Qualitative Inquiry* 16 (6):455 - 468.

Heyvaert, M., K. Hannes, B. Maes, and P. Onghena. 2013. Critical Appraisal of Mixed Methods Studies. *Journal of Mixed Methods Research* 7 (4):302 - 327.

Honohan, P. 2010. Partial credit guarantees: principles and practice. *Journal of Financial Stability* 6 (1):1 - 9.

Hubermann, M., and M. B. Miles. 2002. *The Qualitative Researcher´s Companion*. Thousand Oaks: Sage.

Hummel, D. 2011. Mittelstands- und Innovationsfinanzierung in Deutschland [Financing SMEs and innovation in Germany], edited by U. Potsdam. Potsdam.

Hussain, J., C. Millman, and H. Matlay. 2006. SME financing in the UK and in China: a comparative perspective. *Journal of Small Business and Enterprise Development* 13 (4):584 - 599.

Ingersoll, G. M. 2010. Analysis of 2x2 Contingency Tables in Educational Research and Evaluation. *International Journal for Research in Education* 27:1 - 14.

Institut der deutschen Wirtschaft Köln [Institute of German Economy Collogne]. *Neuntes Bundesländerranking [Ninth Federal State Ranking]* 2011 [cited 27 August 2011. Available from http://www.bundeslaenderranking.de/files/pdf/2011_bundeslaenderranking_endbericht.pdf].

Institut für Mittelstandsforschung. *Mittelstand im Überblick [Mittelstand at a glance]* 2013 [cited 25.5.2014. Available from http://www.ifm-bonn.org/statistiken/mittelstand-im-ueberblick/#accordion=0&tab=1].

Johnson, R. B., A. J. Onwuegbuzie, and L. A. Turner. 2007. Toward a Definition of Mixed Methods Review. *Journal of Mixed Methods Research* 1 (2):112 - 133.

Kano, M., H. Uchida, G. F. Udell, and W. Watanabe. 2011. Information verifiability, bank organization, bank competition and bank-borrower relationships. *Journal of Banking & Finance* 35 (4):935-954.

Kanso, A. 2000. Mail surveys: Key factors affecting response rates. *Journal of Promotion Management* 5 (2):3 - 16.

Kinnear, P. R., and C. D. Gray. 2008. *PASW statistics 17 made simple*. Hove Psychology Press.

Kirchhoff, S., S. Kuhnt, P. Lipp, and S. Schlawin. 2010. *Der Fragbogen [The Questionnaire]*. Vol. 5. Wiesbaden: VS Verlag.

Koetter, M. 2013. Market structure and competition in German banking. Frankfurt: German Council of Economic Experts.

Kramer, D. 2008. *Bürgschaftsbanken als Instrument zur Überwindung von Kreditrationierung in Deutschland? [Guarantee Banks as an Instrument to Overcome Credit Rationing in Germany?]*. Stuttgart: ibidem.

Krämer, W. 2003. *Mittelstandsökonomik - Grundzüge einer umfassenden Analyse kleiner und mittlerer Unternehmen [SME Economics - Aspects of a Comprehensive Analysis of Small and Medium-Sized Enterprises]*. München: Vahlen.

Langer, T., and D. Schiereck. 2002. Kreditvergaben über Bürgschaftsbanken: Eine theoretische Analyse zur potentiellen Vorteilhaftigkeit [Bank lending via Guarantee Banks: A theoretical analysis about the potential advantageousness]. *Zeitschrift für Betriebswirtschaft* 72 (2):141 - 164.

Le, N. T. B., and T. V. Nguyen. 2009. The Impact of Networking on Bank Financing: The Case of Small and Medium-Sized Enterprises in Vietnam. *Entrepreneurship: Theory & Practice* 33 (4):867 - 887.

Leeth, J. D., and J. A. Scott. 1989. The incidence of secured debt: Evidence from the small business community *Journal of Financial and Quantitative Analysis* 24 (3):379 - 394.

Lelarge, C., D. Sraer, and D. Thesmar. 2008. Entrepreneurship and Credit Constraints - Evidence from a French Loan Guarantee Program. In *Technical report*, edited by University of California.

Levenson, A. R., and K. L. Willard. 2000. Do Firms Get the Financing They Want? Measuring Credit Rationing Experienced by Small Businesses in the U.S. *Small Business Economics* 14 (2):83 - 94.

Levitsky, J. 1993. Credit guarantee funds and mutual guarantee systems. *Small Enterprise Development* 4 (2):4 - 15.

———. 1997a. Credit guarantee schemes for SMEs - an international review. *Small Enterprise Development* 8 (2):4 - 17.

Liamputtong, P. 2009. *Qualitative Research Methods*. 3 ed. Oxford: Oxford University Press.

Lindner, J. R., T. H. Murphy, and G. E. Briers. 2001. Handling nonresponse in social science research. *Journal of Agricultural Education* 42 (4):43 - 53.

Lindner, J. R., and G. J. Wingenbach. *Communicating the Handling of Nonresponse Error in Journal of Extension Research in Brief Articles* 2002 [cited 11.08.2012. Available from http://www.joe.org/joe/2002december/rb1.php.

Lozar Manfreda, K., M. Bosnjak, J. Berzelak, I. Haas, and V. Vehovar. 2006. Web surveys versus other survey modes. *International Journal of Market Research* 50 (1):79 - 104.

Lydersen, S., M. W. Fagerland, and P. Laake. 2009. Recommended tests for association in 2x2 tables. *Statistics in Medicine* 28 (7):1159 - 1175.

MacCallum, R. C., K. F. Widaman, S. Zhang, and S. Hong. 1999. Sample size in factor analysis. *Psychological Methods* 4 (1):84 - 99.

Malhotra, N. K. 2010. *Marketing Research*. 6th ed. New Jersey: Pearson Education.

Manove, M., A. J. Padilla, and M. Pagano. 2001. Collateral versus project screening: a model of lazy banks. *Rand Journal of Economics* 32 (4):726 - 744.

Matsunaga, M. 2010. How to Factor-Analyze Your Data Right: Do´s, Don´ts, and How-To´s. *International Journal of Psychological Research* 3 (1):97 - 110.

McHugh, M. L. 2013. The Chi-square test of independence. *Biochemia Medica* 23 (2):143 - 149.

Menkhoff, L., D. Neuberger, and O. Rungruxsirivorn. 2012. Collateral and its subsitutes in emerging markets´ lending. *Journal of Banking & Finance* 36 (3):817 - 834.

Mertens, D. M. 2010. Philosophy in mixed methods teaching: The transformative paradigm as illustration. *International Jouranl of Multiple Research Approaches* 4 (1):9 - 18.

Meyer, R., and G. Nagarajan. 1996. Evaluating credit guarantee programs in developing countries. In *Paper presented at the Meetings of the American Agricultural Economics Association*. San Antonio.

Miller, L. E., and K. L. Smith. 1983. Handling nonresponse issues. *Journal of Extension* 21 (5):45 - 50.

Molina-Azorín, J. F. 2011. The Use and Added Value of Mixed Methods in Management Research. *Journal of Mixed Methods Research* 5 (1):7 - 24.

Morgan, D. L. 2007. Paradigms Lost and Pragmatism Regained. *Journal of Mixed Methods Research* 1 (1):48 - 76.

Muijs, D. 2011. *Doing Quantitative Research in Education with SPSS*. 2nd ed. London, Thousand Oaks, New Delhi: Sage Publications.

Neuberger, D., and S. Räthke-Döppner. 2008. Wirksamkeit von Landesbürgschaften und Bürgschaftsbanken: eine empirische Studie für Mecklenburg-Vorpommern [Efficiency of guarantees and guarantee banks: an empirical study of Mecklenburg-Hither Pomerania]. In *Working Paper No. 87*, edited by University of Rostock.

Newby, R., J. Watson, and D. Woodliff. 2003. SME Survey Methodology: Response Rates, Data Quality, and Cost Effectiveness. *Entrepreneurship: Theory and Practice* 28 (2):163 - 172.

Newman, S. W. 1962. Differences between early and late respondents to a survey. *Journal of Advertising Research* 2 (2):37 - 39.

Nitsch, M., and D. Kramer. 2010. Credit guarantee systems for small enterprises under scrunity: the case of the German Buergschaftsbanken. Rio de Janeiro: Revista de Administracao Pública.

Norusis, M. J. 2009. *PASW Statistics 18 Statistical Procedures Companion*. Upper Saddle River: Prantice Hall.

OECD. 2006. The SME financing gap: Theory and evidence,. *Financial Market Trends* 91:87 - 97.

———. 2009. The Impact of the Global Crisis on SME and Entrepreneurship Financing and Policy Responses, edited by S. a. L. D. Centre for Entrepreneurship. Paris OECD.

Oh, I., J.-D. Lee, A. Heshmati, and G.-G. Choi. 2009. Evaluation of credit guarantee policy using propensity score matching. *Small Business Economics* 33 (3):335 - 351.

Onwuegbuzie, A. J., and R. B. Johnson. 2006. The Validity Issue in Mixed Research. *Research in the Schools* 13 (1):48 - 63.

Ortiz-Molina, H., and M. F. Penas. 2008. Lending to small businesses: the role of loan maturity in adressing information problems. *Small Business Economics* 30 (4):361 - 383.

Parker, S. C. 2002. Do Banks Ration Credit to New Enterprises? And Should Governments Intervene? *Scottish Journal of Political Economy* 49 (2):162 - 195.

Patton, M. Q. 2001. *Qualitative Research & Evaluation Methods*. 3 ed. Thousand Oaks: Sage Publications.

Peter, J. P. 1977. Reliability, Generalizability and Consumer Behavior. In *NA - Advances in Consumer Research Volume 04*, edited by J. William D. Perreault. Atlanta: GA: Association for Consumer Research 394 - 400.

Petersen, M. A., and R. G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. *The Journal of Finance* 49 (1):3 - 37.

Piontkowski, J. O. 2009. Wertorientierte Unternehmensführung in mittelständischen Unternehmen [Value-oriented business management in SMEs]. *Controlling* 21 (7):357 - 363.

Plano Clark, V. L., A. L. Garrett, and D. L. Leslie-Pelecky. 2010. Applying Three Strategies for Integrating Quantitative and Qualitative Databases in a Mixed Methods Study of a Nontraditional Graduate Education Program. *Field Methods* 22 (2):154 - 174.

Porst, R. 2009. *Fragebogen [Questionnaires]*. Vol. 2. Wiesbaden: VS Verlag.

Pratt, M. G. 2009. For the lack of a boilerplate: tips on writing up (and reviewing) qualitative research. *Academy of Management Journal* 52 (5):856 - 862.

Reize, F. 2005. Investitionsfinanzierung im Mittelstand - gibt es ausreichend Kredite für kleine und mittlere Unternehmen? [Investment Finance in the Mittelstand - are there sufficient loans available for SMEs?]. In *Mittelstands- und Strukturpolitik No. 33*, edited by Kreditanstalt für Wiederaufbau, 17 - 42.

Reize, F. 2011. KfW-Mittelstandspanel 2011 [KfW-medium-sized panel 2011], edited by Kreditanstalt für Wiederaufbau [Reconstruction Loan Coorperation]. Frankfurt/Main.

Richards, D. 1996. Elite interviewing: approaches and pitfalls. *Politics* 16 (3):199 - 204.

Riding, A., J. Madill, and G. Haines. 2007. Incrementality of SME Loan Guarantees. *Small Business Economics* 29 (1-2):47 - 61.

Riding, A. L., and G. Haines. 2001. Loan Guarantees:Costs of Default and Benefits to Small Firms. *Journal of Business Venturing* 16 (6):595 - 612.

Sapnas, K. G., and R. A. Zeller. 2002. Minimizing sample size whan using explanatory factor analysis for measurement. *Journal of Nursing Measurement* 10 (2):135 - 153.

Saunders, M., P. Lewis, and A. Thornhill, eds. 2009. *Research methods for business students*. 5th ed. London: Pearson Edition.

Schendera, C. 2010. *Clusteranalyse mit SPSS [Cluster Analysis with SPSS]*. München: Oldenbourg Verlag.

Schiereck, D. 2002. Bürgschaftsbanken in Deutschland [Guarantee Banks in Germany]. *Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen* 25 (2):174 - 188.

Schierenbeck, H., M. Lister, and S. Kirmße. 2008. *Ertragsorientiertes Bankmanagement - Risiko-Controlling und integrierte Rendite-/Risikosteuerung [Revenue-focused Bank Management - Risk-Controlling and integrated Return and Risk Control]*. Vol. 9. Wiesbaden: Gabler.

Schmidt, A. G., and M. van Elkan. *Macroeconomic Benefits of German Guarantee Banks* 2010 [cited 12.10.2010. Available from http://www.vdb-info.de/media/file/66.VDB_inmit-studie_EN.pdf].

Schmidt, A. G., and M. van Elkan, eds. 2006. *Der Gesamtwirtschaftliche Nutzen der deutschen Bürgschaftsbanken [The Macroeconomic Benefits of German Guarantee Banks]*. edited by I. I. f. M. a. d. U. T. e.V. Münster: LIT Verlag Berlin.

Schulte, M., and A. Horsch. 2004. *Wertorientierte Bannksteuerung II: Risikomanagement [Value-oriented bank controlling II: risk management]*. 3 ed. Frankfurt/Main: Bankakademie Verlag GmbH.

Schwarz, M., and V. Zimmermann. 2012. Unternehmensbefragung 2012 [Enterprise Survey 2012], edited by Kreditanstalt für Wiederaufbau [Reconstruction Loan Coorperation]. Frankfurt am Main.

Scott, P. J., and J. S. Briggs. 2009. A Pragmatist Argument for Mixed Methodology in Medical Informatics. *Journal of Mixed Methods Research* 3 (3):223 - 241.

Shephard, L. A. 1993. Evaluating test validity. In *Review of research in education*, edited by L. Darling-Hammond. Washington, DC,: American Educational Research Association, 405 - 451.

Simsek, Z., and J. F. Veiga. 2000. The Electronic Survey Technique: An Integration and Assessment. *Organizational Research Methods* 3 (1):93 - 115.

———. 2001. A Primer in Internet Organizational Surveys. *Organizational Research Methods* 4 (3):218 - 235.

Sommer Harrits, G. 2011. Mora Than Method?: A Discussion of Paradigm Differences Within Mixed Methods Research. *Journal of Mixed Methods Research* 5 (2):150 - 166.

Stefanovic, M. 2009. Wirkungsweise und Bedeutung des Bürgschaftsbankensystems für die Mittelstandsfinanzierung in Deutschland [Mode of Operation and Meaning of the German Guarantee Banks for Financing SMEs]. In *Banken, Performance und Finanzmärkte [Banks, Performances and Financial Markets]*, edited by R. Nagel and K. Serfling. Frankfurt/Main: Fritz Knapp Verlag, 269 - 286.

Steijvers, T., W. Voordeckers, and K. Vanhoof. 2010. Collateral, relationship lending and family firms. *Small Business Economics* 34 (3):243 - 259.

Stiele, M. 2008. *Wettbewerb im Bankensektor: eine Untersuchung unter besonderer Berücksichtigung des Wettbewerbsverhaltens der Sparkassen [Competition in the Banking Sector: an Analysis under Special Cosideration of the Behaviour of the Savings Banks]*. edited by Gabler. Wiesbaden: Gabler.

Stiglitz, J. E., and A. Weiss. 1981. Credit Rationing in Markets with Imperfect Information. *American Economic Review* 71 (3):393 - 410.

Tchouvakhina, M., and V. Zimmermann. 2009. Finanzmärkte im Wandel - Die Bedeutung von Finanzierungsinstrumenten im Zeitablauf [Financial Markets in Change - Meaning of Financial Instruments in Lapse of Time]. In *Akzente No 11, December 2009*, edited by Kreditanstalt für Wiederaufbau, (KfW). Frankfurt/Main.

Teisl, M. F., B. Roe, and M. Vayda. 2005. Incentive effects on response rates, data quality, and survey administration costs. *International Journal of Public Opinion Research* 18 (3):364 - 373.

Tiwari, R., and S. Buse. 2006. The German Banking Sector: Competition, Consolidation & Contentment. In *Technology and Innovation Management*. Hamburg: Hamburg University of Technology.

Uesugi, I., K. Sakai, and G. M. Yamashiro. 2010. Effectiveness of Credit Guarantees in the Japanese Loan Market. *Journal of the Japanese and International Economics* 24 (4):457 - 480.

Van Caneghem, T., and G. Van Campenhout. 2012. Quantity and quality of information and SME financial structure. *Small Business Economics* 39 (2):341 - 358.

Verband Deutscher Bürgschaftsbanken. 2009. Mit Sicherheit(en) aus der Krise - Die deutschen Bürgschaftsbanken 2008/2009 [The German Guarantee Banks 2008/2009]. Berlin.

———. 2011. Aufschwung begleiten, Kredite sichern 2010 [Attending recovery, assuring loans 2010]. Berlin.

———. 2012. Stabilität für den Mittelstand [Stability for the Mittelstand]. Berlin.
Vogel, R., and D. Adams. 1997. Costs and benefits of loan guarantee programs. *The Financier* 4 (1&2):22 - 29.
Voordeckers, W., and T. Steijvers. 2006. Business collateral and personal commitments in SME lending. *Journal of Banking & Finance* 30 (11):3067 - 3086.
Waschbusch, G., and N. Straub. 2008. Notwendigkeit und Möglichkeiten der Finanzierung des Mittelstands durch staatliche Förderprogramme [Requirement and Possibilities of Governmental Support for Financing the German Mittelstand]. *Finanz Betrieb* 2008 (12):819 - 832.
Westhead, P., and M. Cowling. 1998. Family firm research: The need for a methodological rethink. *Entrepreneurship: Theory and Practice* 23 (1):31 - 56.
Williams, B., T. Brown, and A. Onsman. 2010. Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Care* 8 (3):1 - 13.
Williams, D. R., and J. J. Vaske. 2003. The Measurement of Place Attachment: Validity and Generalizability of a Psychometric Approach. *Forest Science* 49 (6):830 - 840.
Zecchini, S., and M. Ventura. 2009. The impact of public guarantees on credit to SMEs. *Small Business Economics* 32 (2):191 - 206.
Zimmermann, V. 2006. Entwicklung und Determinanten des Zugangs zu Krediten [Progress and Determinants of Access to Finance]. In *Mittelstands- und Strukturpolitik No. 35*, edited by Kreditanstalt für Wiederaufbau. Frankfurt/Main, 45 - 76.
———. 2007. Kreditsicherheiten - Wahrnehmung der Anforderungen und eingesetzten Instrumente [Collateral - Perception of Requirements and Applied Instruments], WirtschaftsObserver No. 29, Frankfurt/Main.
———. 2008. Der Zugang zu Krediten. Entwicklung im Zeitablauf, Beurteilung und Bedeutung von Teilaspekten aus Unternehmenssicht [Access to Finance. Development in lapse of time, Evaluatiuon and Meaning of Partial Aspects in the Prospect of Businesses]. In *Mittelstands- und Strukturpolitik No. 41*, edited by Kreditanstalt für Wiederaufbau, [reconstruction loan corporation]. Frankfurt/Main, 1 - 25.
———. 2009. Unternehmensbefragung 2009 [Survey of Enterprises 2009], edited by Kreditanstalt fuer Wiederaufbau, (KfW). Frankfurt/Main.
Zimmermann, V., and J. Steinbach. 2011. Unternehmensbefragung 2011 [Enterprise Survey 2011], edited by Kreditanstalt für Wiederaufbau [Reconstruction Loan Coorperation]. Frankfurt/Main.