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Credit rationing of small firms by major banks in South Africa

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Credit rationing of small firms by major banks in South Africa

Stephen Rutendo Madziwa

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2018

ABSTRACT

SMEs are key to economic growth, development and fighting unemployment, yet their growth or survival continues to be threatened by their lack of access to credit finance from the major banks in South Africa. This lack of access has been attributed to a lack of creditworthy borrowers. Credit rating, relationships with the banks, the presence of hard information and the availability of collateral or third-party guarantees were identified as possible borrower characteristics that might affect the outcome of their loan applications. The study was informed by data collected using a survey-type questionnaire, from which responses were used to evaluate the borrowers' credit scores, relationships with the banks, whether they presented hard information or whether they presented collateral or third-party guarantees with their applications and the outcome of the loan applications. Having relationships with the banks or presenting hard information were found to be insignificant factors in predicting the outcome of small businesses' loan applications. A good credit rating, defined as having a credit scores above a threshold value, or the presence of collateral or third-party guarantees or both, give the borrower a good chance of loan application success. Small businesses in South Africa need to maintain a good credit rating or be able to present collateral or third-party guarantees if their loan applications at the major banks are to be successful.

DECLARATION

I, Stephen Rutendo Madziwa, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Stephen Rutendo Madziwa

Signed at …Johannesburg……

On the ……23rd…….. day of ……October…… 2018

DEDICATION

This research report is dedicated to my two boys, Tyler and Sean, for all your soccer matches I missed. I hope this inspires you to excel beyond what I have achieved.

ACKNOWLEDGEMENTS

I am using this opportunity to express my gratitude to everyone who supported me throughout the course of this MBA project. I am thankful for their inspiring guidance, invaluably constructive criticism and friendly advice during the project work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

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CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to investigate the borrower characteristics affecting the credit application success rate for small firms at the big four banks in South Africa by comparing the small firms' individual loan outcomes and the profiles the small firms presented to the banks.

1.2 Context of the study

According to The Banking Association of South Africa (2016), Small and Medium Enterprises (SMEs) contribute significantly to economic growth, development and the reduction of unemployment. Yildirim, Akci, and Eksi (2013) attribute this to their agility and adaptability to changes in the business environment, while Altman and Sabato (2007) add their being in tune with changing local customers' needs. SMEs are vital for future growth and the transformation agenda (African National Congress Progressive Business Forum, 2014). SMEs comprise more than 90% of formal businesses in South Africa, employing 60% of the labour force and accounting for approximately 34% to 50% of GDP (Mazanai & Fatoki, 2012; The Banking Association of South Africa, 2016).

SMEs provide employment opportunities to the less educated (Amra, Hlatshwayo, & McMillan, 2013) making them better suited than big companies to solve the unemployment dilemma in the country which has been highlighted as being mainly structural (Hausmann, 2014; Hull, 2014; Mashau & Houghton, 2015; Van der Westhuizen & Swart, 2015). According to Stats SA (2016), employment in the informal sector (dominated by small firms) grew 50% faster than the formal sector employment between 2010 and 2016, confirming that small firms are key to fighting unemployment in South Africa (Altman & Sabato, 2007).

Sources of financing for any business can be classified as either equity or debt. Popular sources of finance amongst SMEs are private equity and debt from the

entrepreneur, family and friends (internal funding) (Berger & Udell, 2006; Demirgüç-Kunt & Klapper, 2012; Falkena et al., 2001; Kiisel, 2013). SMEs' access to public equity and debt markets (external funding) is generally limited (Berger & Udell, 2006; Fatoki & Odeyemi, 2010) making the access to private debt markets of huge significance. Their access to external funding is largely dependent on commercial banks (Underhill Corporate Solutions, 2011), particularly in developing countries (Beck, Demirgüç-Kunt, & Maksimovic, 2008; Canales & Nanda, 2012). However, only about 8% of small firms in Africa get financing from banks (Demirgüç-Kunt & Klapper, 2012; Grundling & Kaseke, 2010). The FinScope Survey of 2010 found 39% of small businesses in South Africa have financial difficulty while setting up the business (Grundling & Kaseke, 2010). Thus, although most small businesses struggle with finances, only a small fraction of them have access to formal financing from banks.

Despite the crucial role SMEs play in South Africa, their profitability, development (Bigsten et al., 2003; Fatoki & Odeyemi, 2010), growth and survival (Grundling & Kaseke, 2010; Maas & Herrington, 2006), continues to be hindered by constrained credit access; this challenge is not unique to South Africa. Various authors have found the same trend around the world, among them Ahiawodzi and Sackey (2013), Demirgüç-Kunt and Klapper (2012), Kundid and Ercegovac (2011), Martínez-Sola, García-Teruel, and Martínez-Solano (2014) and OECD (2006) have highlighted the same trend in Ghana, Africa as a whole, Croatia, Spain and OECD countries respectively. Their continual failure to access funding is a challenge for policy makers (Canales & Nanda, 2012; Demirgüç-Kunt & Klapper, 2012).

Though the amended National Small Business Act of South Africa of 1996 (Republic of South Africa, 2003) defines SMEs using five broad categories: business sector or subsector classification, size of class, maximum equivalent paid employees, maximum turnover, maximum gross asset value excluding fixed property, in the context of this study, small firms are defined as having revenue of less than R5m, and fewer than 100 employees. Despite this definition, literature on SMEs' limited access to funding is equally applicable to the small firms in general; for this reason, henceforth, the terms 'small firms' and 'SMEs' may be used interchangeably but are assumed to refer to small firms as defined above. The data collection for the study

was from survey questionnaire responses received from small business owners in South Africa. This study analysed this data to determine the significance of these factors when small businesses applied for loans from the major banks in South Africa. The literature review considered the factors that literature suggests have an effect on loan application success for small firms.

The South African banking sector is characterised by administrative and credit information systems that are well regulated and supported by a sound legal system (Sufian & Kamarudin, 2016). This makes the South African lending sector fairly well developed compared to a typical African lending sector. On the demand side though, the South African lending sector is still affected by some typical African economy challenges. Beck et al. (2008) found that small firms in countries with poor institutional development (legal enforcement and credit information systems) rarely use bank finance. This suggests that, from a supply side perspective, small firms in South Africa should have better access to bank credit compared to small firms in other African countries. The South African banking industry is a very competitive oligopoly dominated by the four big banks, ABSA (a subsidiary of Barclays Africa Group), First National Bank (FNB), Nedbank and Standard Bank, as cited by Sufian and Kamarudin (2016). Together they account for about 90% of the total assets owned by South African registered banks (South African Reserve Bank, 2015) and more than 80% of banking customers (BusinessTech, 2016).

According to Canales and Nanda (2012) and Cotugno, Monferrà, and Sampagnaro (2013), credit constrained SMEs have a better chance of being granted credit by decentralised banks than by major banks that have centralised decision makers. This finding suggests the small firms in South Africa are not likely to be granted credit by the major banks controlling more than 90% of the bank lending market, leaving them with only a better chance at less than 10% of the market. This in itself is a form of credit rationing, making it crucial to address the issue of small firms' credit access from major banks, for these reasons the study will only focus on these big four banks.

1.3 Problem statement

1.3.1 *Main problem*

Small businesses are rarely aware of the characteristics banks look for in determining the merits of a loan application. The problem is to establish small firm characteristics affecting loan application success and their impact on the loan application success using evidence from the small businesses.

1.3.2 *Sub-problems*

The first sub-problem is to determine the borrower characteristics that might affect loan application outcomes. The literature review largely informs the determination of borrowers' characteristics presented to the banks that are likely to affect the outcome of small firms' loan applications.

The second sub-problem is to determine the impact of the characteristics identified in the literature review on the loan application outcome.

1.4 Significance of the study

The contributions of small firms to the economy make the findings of this study of potential academic and policy significance (Canales & Nanda, 2012).

The study analysed the survey responses of small firms that had applied for loans at the major banks and determined the contribution of the different borrower factors to the credit market failure of them raising capital. Chakravarty and Xiang (2013) established young and small businesses in competitive environments in emerging economies as having fewer relationships with their banks and other financial institutions and are therefore discouraged from applying for credit. This means the findings of the study might also be applicable to these discouraged borrowers even if they are not included in the source data.

The findings of the study contribute to the existing body of knowledge on banking processes. Banks have criteria they use to evaluate the merits of each loan application, however small businesses are usually unaware of these criteria. Small businesses that might consider applying for credit are not aware of such criteria and thus cannot plan accordingly for when the need for funding arises. Further, it will help small firms, and especially potential entrepreneurs, by highlighting the issues they might have some control over that they might need to address to improve their chances of loan application success with the major banks. Likewise, the study will benefit lenders in their development of a different perspective from which to look at small firms' lending criteria.

An understanding of how SMEs could improve their access to finance should improve performance of the economy through improved employment and utilisation of resources. SMEs generally employ more people from the less educated population; their sustained survival would increase the number of small firms in the economy and improve the employment dilemma that continues to be structural. Increasing employment would reduce the strain on the social welfare system while increasing the productivity of the economy and thus aggregate expenditure which would stimulate growth of the economy (Janse Van Rensburg, McConnell, & Brue, 2015).

Small and young firms generally tend to be more innovative and agile than larger companies (Mancusi & Vezzulli, 2014; OECD, 2006) i.e. they can more easily adapt to market changes or disturbances (Slack, Chambers, & Johnston, 2007; Smit & Watkins, 2012). Improving their access to credit will provide the much-needed bridging finance and funding for growth leading to higher survival rate and growth of small firms respectively and consequently, more innovative small firms and thus improved economic development.

Reduced information asymmetries should lead to reduced risk of lending and thus reduced cost of finance. Changing the perception of small firms from high-risk clients to *bona fide* businesses with genuine intentions will improve their access to funding as banks make more funds available for lending even with tightening Basel III requirements.

Lenders, especially in developing economies like South Africa, might need to develop unique credit scoring methods that are more inclusive of the majority of the businesses by placing more importance on characteristics that reduce their risk exposure while being readily obtainable for most businesses. Developing economies have high population growth rates though the majority of these populations are continually marginalised from economic participation. Once lending institutions find a new way of doing business with small firms while minimising their risk exposure, they can form very profitable relationships, even at lower margins with volume compensating for the reduced margins. This would disrupt the small business lending market and likely lead to significant growth of the economy.

Many large enterprises start as small firms, their survival and subsequent growth while establishing relationships with the banks might be of significant long-term benefit to the banks which invest in building these relationships earlier on (Underhill Corporate Solutions, 2011).

When small firms have better access to finance from commercial banks, then developing economy governments do not have to set up development banks and set aside funds, in the form of grants, from their limited budgets for supporting small firms aligned with their policy objectives. This would reduce government spending on small business support and consequently, higher employment would reduce government expenditure on social grants making more government funds available for capital expenditure to improve the infrastructure delivery.

1.5 Delimitations of the study

- The study is limited to small businesses that have expressed a demand for financing from the major banks. Small businesses that no longer use the services of the formal banking sector and have not applied for funding or have used alternative sources of funding are excluded as they did not submit any application to the banks.

- The findings of the study were limited to the period November 2014 to February 2018. This period was chosen to give the study findings current relevance while providing sufficient relevant data for analysis.
- The study focuses on the microeconomic perspective and excludes macroeconomic factors. These macroeconomic factors are controlled for by assuming the sampling period was characterised by a relatively stable macroeconomic environment.
- The study focuses on borrower characteristics (demand side) within the major banks in South Africa, despite other works, like Green (2003), attributing credit rationing mainly to supply side factors. Supply side refers to the providers of credit, i.e. banks, investors or financial institutions. These supply side factors include bank size, local competition (Agostino, Silipo, & Trivieri, 2008; Canales & Nanda, 2012), bank organisational structure (Beck, Demirgüç-Kunt, & Pería, 2011; Canales & Nanda, 2012), financial and legal sectors' development and institutional development (Beck et al., 2008) that have all been shown to affect the credit rationing behaviours of banks. Andrianova, Baltagi, Demetriades, and Fielding (2015) citing Honohan and Beck (2007) argue that African credit markets are liquid, implying inadequate supply is not necessarily the concern, but the banks highlight a lack of creditworthy borrowers. This makes borrower characteristics more important than the supply side factors.
- Global financial markets and their impact on the local economy are excluded to limit research to a manageable scope.
- The respondents' representativeness of the South African small business sector that have applied for loans from the major banks.

1.6 Assumptions

- The sampling period was assumed to be characterised by a stable macroeconomic environment. As a result, the macroeconomic factors are assumed to have the same impact on the outcome of the appraisal of each of the loan applications. The difference in the outcomes of the loan applications

are assumed to be based entirely on the selected characteristics of the borrowers.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter gives a background discussion of the various factors relevant to the research questions affecting credit rationing of the small businesses based on existing literature. Section 2.2 defines credit rationing as it is used in this study. Section 2.3 discusses the factors that affect credit rationing of small businesses. Section 2.4 presents and provides background to the borrower characteristics used to answer the research questions and derives the hypotheses that are tested. Section 2.5 concludes the literature review.

2.2 Definition of Credit Rationing

Jaffee and Modigliani (1969) defined credit rationing as occurring as a result of disequilibrium in the credit market caused by excess demand for credit at the prevailing commercial lending rate (cost of lending). In perfect markets, with efficient allocation of resources, this disequilibrium is corrected by increasing the cost of credit and the supply of credit, resulting in a new equilibrium interest rate where credit supply matches the demand for credit (Janse Van Rensburg et al., 2015). However, credit markets are unique in that there is no exchange of goods or services; instead the lender extends credit to the borrower in exchange for a promise of repayment, at which point there is no way of determining if the promise would be honoured (Jaffee & Stiglitz, 1990).

Credit rationing occurs when:

1. financial institutions limit the amount of money borrowed, or refuse to lend any money, even if the borrowers are willing to pay the interest (Jaffee & Stiglitz, 1990; Stiglitz & Weiss, 1981).
2. lenders restrict the borrowers' access to capital based on their perception of the borrowers' creditworthiness or the lending environment or both (Stiglitz & Weiss, 1981)

3. interest rates exceed current market rates, regardless of the supply and demand equilibrium (Jaffee & Stiglitz, 1990).

Luçi (2004) and OECD (2006), quoting Jaffee and Stiglitz (1990) and Stiglitz and Weiss (1981), further classified credit rationing as pure credit rationing or redlining. Pure credit rationing occurs when some applicants obtain loans whereas apparently similar applicants willing to pay the same price or non-price costs are denied or limited (Luçi, 2004). Redlining, on the other hand, occurs when the specific group of applicants with distinct characteristics are unable to obtain loans at any interest rate with a certain supply of credit, but would be able to obtain these loans if loan supply were to increase. However, if we accept the proposition that African credit markets are liquid (Andrianova et al., 2015), then supply is not a constraint. Increasing supply further should not have any impact on the credit rationing, implying that the credit rationing occurring is pure credit rationing since it cannot be defined as redlining.

Credit rationing can also be split into borrower type rationing (Stiglitz & Weiss, 1981) whereby without any apparent differences, some borrowers get credit while others are denied, despite their projects also being viable or it can be loan size rationing (Jaffee & Russell, 1976) where all borrowers get some of the amount they applied for. Since the loan application outcome considered for the study is a distinct “approved” or “declined” outcome, then lenders who have their loans approved for less than the amount they applied for are not considered credit rationed, i.e. only borrower type rationing is considered credit rationing in this study (Stiglitz & Weiss, 1981).

2.3 Factors affecting credit rationing

The constrained access of small firms to funding is due to a combination of supply side and demand side factors. Mancusi and Vezzulli (2014) found that young and small firms face financing difficulty and, *ceteris paribus,* are prone to credit rationing even after their age and size are considered. This implies that there are other factors affecting credit rationing of young and small firms in addition to their age and size.

Since African credit markets are liquid (Andrianova et al., 2015), supply side credit rationing factors should not be significant in the context of this study thus the focus is on the demand side factors (borrower characteristics).

2.3.1 *Asymmetric information*

In economics, efficient allocation of resources in perfect markets is achieved when participants share the same relevant information. Likewise, in perfect credit markets, supply and demand for credit should determine the cost of credit (interest rates). However, credit markets are not perfect in the sense that money is exchanged for a promise of repayment that may or may not be fulfilled (Green, 2003). At times, the borrowers themselves do not even know for sure if they will be able, even if they want to repay the loan.

Worse still, the lenders, in addition to having inferior information about the borrower's ability to repay, also do not know if the borrower intends to repay. Furthermore, the lender would not have information about the viability of the borrower's project (Stiglitz & Weiss, 1981) or they can be pessimistic about the project risk declared by borrowers because revealing the truth about risky projects might compromise the chances of borrowers being granted the credit they desire.

With perfect information credit rationing will not exist, because lenders would be able to separate the bad borrowers from the good borrowers and thus be able to allocate credit only to the good borrowers (Ahiawodzi & Sackey, 2013). During loan applications, small firms rarely have the information requested by lenders readily available, if at all. Information asymmetry exists when parties do not share the same information and this leads to agency problems, moral hazard or adverse selection (Mazanai & Fatoki, 2012; Stiglitz & Weiss, 1981). The demand side factors in credit rationing mainly cause adverse selection and moral hazard effects. Some of these demand side factors identified in literature are poor or lack of credit history or collateral or third-party guarantees and unreliable financial records (Ferretti, 2016).

Agency problem

Agency problem is a conflict of interest inherent in any relationship where one party, with more information, is expected to act in another party's best interests (Bosse & Phillips, 2016). Agency problem affects the supply side and its discussion is beyond the scope of this study.

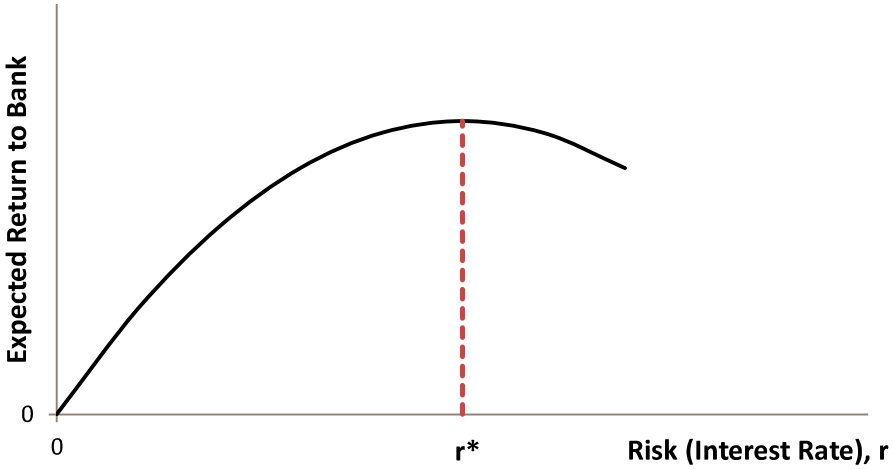
Adverse selection

Adverse selection occurs when two parties hold different information on the quality of the overall product, resulting in sellers with better quality product exiting the market, leading to a drop in the quality of product being sold ("lemons") which only serves to reinforce the buyers' reduced appetite, causing further price drop (Akerlof, 1970). Adverse selection is a consequence of hidden information about different borrowers' ability and intent to repay.

Higher interest rates attract riskier borrowers because they know their probability of repayment is low and also as interest rates increase, low risk projects (associated with lower returns) are discouraged (Green, 2003). Some borrowers might acquire a loan at a high interest rate with all intention of repaying, but default due to subsequent financial distress or they simply did not care about the interest rate they were charged in the first place because they had no intention of repaying the loan (Jaffee & Stiglitz, 1990). This leaves projects / borrowers whose return exceeds the lending rate charged by the banks and these higher return projects or businesses tend to be higher risk.

Adverse selection results in a borrower pool that is riskier than the pool of borrowers whose information is more transparent to the lenders. Banks classify borrowers by risk profile and charge different interest rates to each risk category to make a profit from each category. As borrowers' risk profile deteriorates, banks compensate for the increased default risk by increasing interest rates until a critical level is reached beyond which the default risk is too high, and it is no longer profitable for the banks to lend money to these high risk borrowers, also called "lemons" (Jaffee & Stiglitz, 1990; Kundid & Ercegovac, 2011), that is, the profit made by the bank increases at a decreasing rate as interest rate (borrower risk profile) increases until a critical point (r* see Figure 1 below) is reached beyond which further increase in risk profile is out-

weighed by the high default rate of loans and the bank's profit starts to decrease. Because of this dome-shaped profit-risk relationship, banks will not lend to borrowers whose risk profile is beyond the profit maximising optimum.



Source: Stiglitz and Weiss (1981)

Figure 1 Bank profitability versus borrower risk profile

Borrowers who accept high interest rates (in excess of r* above) inadvertently send messages of poor credit rating or desperation for funds or both. This is the dilemma faced by SMEs in South Africa. They are viewed as "lemons", with little capacity or no intention whatsoever of repaying the loan (De Meza & Webb, 1987). This equilibrium credit rationing is the result of profit-maximising behaviours and excess credit demand coexisting (Shen, 2002).

Moral hazard

Moral hazard is defined as actions that increase risks to an entity but another party absorbs the costs associated with that risk, it is a consequence of a hidden action (Hölmstrom, 1979). Moral hazard occurs because lenders and borrowers have different interests and the lender cannot adequately monitor the actions of the borrower (Green, 2003; Stiglitz & Weiss, 1981). The borrower may neglect the project, divert borrowed funds to a riskier project or, of particular concern with small firms, funds may be diverted for private use because of blurred at best, or no

distinction between firm and owner's personal funds (Ahiawodzi & Sackey, 2013; Falkena et al., 2001; OECD, 2006).

Lenders often face information asymmetries when evaluating small businesses' creditworthiness. As a result, they have devised ways of mitigating these asymmetries, such as requesting information about the owner, business or project during the application phase to help establish the associated risks. This documented information they collect is classified as "hard" information.

On the other hand, lenders also rely on relationships with borrowers to address asymmetric information. Once relationships with borrowers are established, the borrowers' transaction accounts held by the lenders reveal to the bank the financial status of the borrower. Borrowers' cash flows, reflected in their transaction accounts, are a better predictor of the capacity of borrowers to repay their loans compared to other hard information like financial records. This information is usually more reliable than hard information like financial statements for small firms.

Where relationships do not exist and borrowers cannot provide reliable hard information, lenders seem to rely on collateral or third-party guarantees as security against the loaned amounts. Reduced information asymmetry gives small firms bargaining power to negotiate better interest rates and loan terms (Kirschenmann & Norden, 2012).

To guard against moral hazard, Agostino et al. (2008) contended that lenders should check if the money borrowed is used for its intended purpose; this can involve banks visiting the borrowers' premises to confirm that the money is being used for its intended purpose. Alternatively, banks can offer incentives for diligent effort on projects through promise of lower interest rates on future loans or they may ask for collateral that the borrower would lose if they fail to repay the loan (Green, 2003; Mazanai & Fatoki, 2012).

Another way of mitigating information asymmetries is by monitoring the level to which the owner is invested in the business i.e. the business's debt-to-equity ratio. It indicates the split of the total funds used to fund the business between borrowed funds (debt) and owner's own funds including retained profits (equity). A high debt-to-

equity ratio signals that the company already has a high level of loans compared to the owners' own funds; an increasing debt-to-equity ratio is an indication of a declining owner commitment and could be a higher financial risk. Typically, though, the challenge with small firms is the unavailability of credible accounting records, which might make the debt-to-equity ratio declared subjective.

To mitigate this risk, lenders can look at other factors like firm's age, experience of owners, number of generations that have run the business in the case of family businesses, etc.

2.3.2 *High administrative costs*

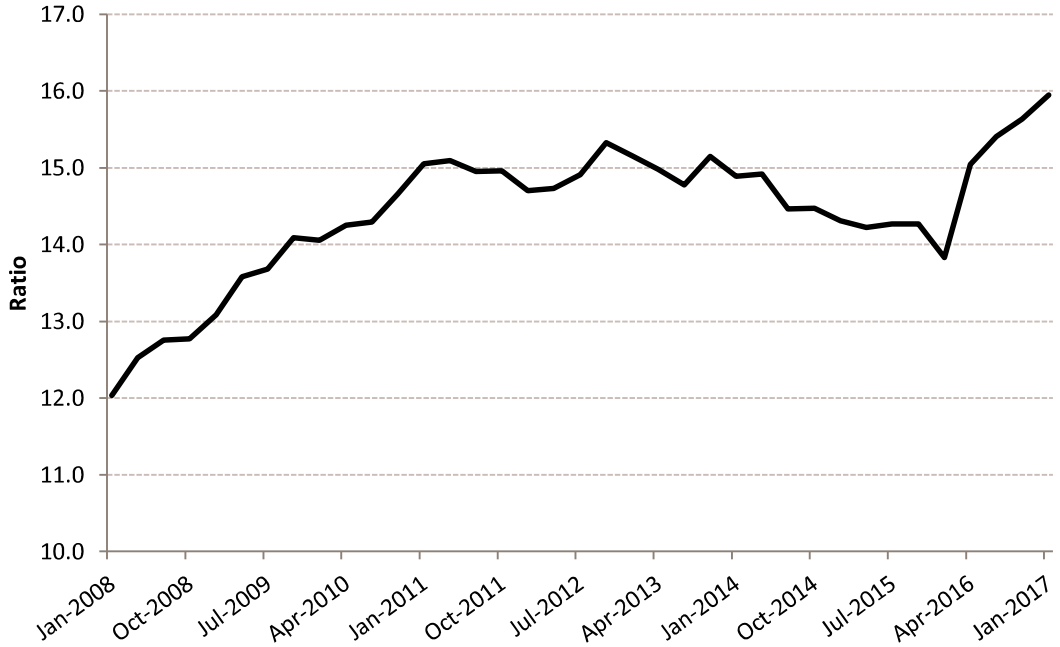
Processing and administrative costs of the loans are normally fixed, as a result the administrative costs per amount borrowed borne by the borrowers tend to be higher with smaller loans which are usually associated with smaller firms (Green, 2003; Mazanai & Fatoki, 2012). Administrative costs include costs of information gathering processes comprising visiting lenders, analysing their businesses and monitoring their loans (OECD, 2006). These costs are often higher for smaller firms than larger firms because the information is generally not readily available in comprehendible format because smaller firms do not have to adhere to any generally acceptable accounting practices (GAAP) or corporate governance requirements, such as King IV (though compliance is voluntary even for the large firms). This means lenders need to increase the level of scrutiny when evaluating hard information from small firms. It also means that lenders should consider the owner's own creditworthiness in addition to the business'.

Population density is strongly linked to financial development in Africa, implying densely populated towns are well serviced by the banks, whereas rural areas suffer from poor economies of scale due to wide dispersion of the population making provision of banking services to the rural population expensive (Beck & Cull, 2013). Big banks are normally situated in urban areas whereas small firms tend to be geographically spread around or away from urban areas where locating the physical addresses might be problematic, increasing this time-cost for screening and

monitoring them. As a result, lenders are inclined to levy higher administrative costs on small firms even before accounting for the greater risk of default (Green, 2003).

Though African banks are less efficient and operate in less competitive markets (Beck & Cull, 2013; Canales & Nanda, 2012), the South African lending sector is well developed and competitive (Beck & Cull, 2013). Increased competition in the South African lending market decreases the profitability of borrower information acquisition (Agostino et al., 2008), thus South African banks should find it less profitable to acquire their own borrower information than other African banks. This argument further supports centralised big banks' reluctance to collect their own borrower information through relationship banking in South Africa.

Reduced incentive to collect borrower information in competitive lending markets may make lenders resort to reckless lending. In part, this reckless lending resulted in the financial crisis of 2007 / 2008, which was caused by financial institutions' investment in sub-prime home mortgages with higher default risk than anticipated (Acharya, Philippon, Richardson, & Roubini, 2009). Regulators responded through Basel III by introducing stricter capital to risk-weighted assets requirements (increase in regulatory capital to risk-weighted assets, see Figure 2) on banks requiring each bank to group its assets together by risk category so that the amount of required capital matches the risk level of each asset. The goal of these requirements is to dampen losses of big banks due to acute decline in value of specific classes of loans' value arising from a decline in financial or economic conditions (Cosimano & Hakura, 2011; Hannoun, 2010).



Source: International Monetary Fund (2017)

Figure 2 Quarterly Bank Regulatory Capital to Risk-Weighted Assets for South Africa

The proposed countercyclical capital buffer added into the Basel III requirements though will enable banks to prevent amplification of any economic crises (Al-Darwish, Hafeman, Impavido, Kemp, & O'Malley, 2011; Hannoun, 2010) which historically have worsened credit rationing for small firms.

In 2011, the capital to risk-weighted assets ratio of African banks was higher than that of non-African countries indicating greater stability, however comparatively, African banks lend less than developing economy non-African banks (Canales & Nanda, 2012). Despite this, Beck et al. (2011) found that banks in developing countries charge higher interest and fees to small firms than banks in developed countries.

The trend of banks' regulatory capital to risk-weighted assets ratio for South Africa is shown in Figure 2. In the aftermath of the 2007 / 2008 financial crisis, this capital adequacy ratio was on an upward trend as financial institutions consolidated their ability to service their depositors. As the macroeconomic environment stabilised, the ratio was on a gentle downward trend during 2014 and 2015 before rising sharply

from early 2016 which might be an indication of decreased at-risk lending or it could simply be an increase in the capital held by the banks.

Beck and Cull (2013) caution that growth of financial penetration should happen in a stable macroeconomic environment with good governance to avoid reckless lending. The International Finance Corporation (2010) and OECD (2006) though, point to the profitability of SME relationships for banks, not necessarily from a credit perspective directly, but from the associated transaction banking that results.

2.3.3 *High risk perception*

Limited or lack of reliable "hard" information within small firms and their high failure rate makes lenders view them as high-risk borrowers. Volatile and unstable environments hamper the chances of the success of loan applications because lenders dislike uncertainty. The uncertainty of borrowers failing to honour their loan terms increases with the length of the term of the loan, which might help explain the findings of Kirschenmann and Norden (2012) that among small firms, lenders prefer short-term loans over long-term loans.

In addition, informal or small firms are subject to micro-economic volatility due to fluctuating incomes (Beck & Cull, 2013; OECD, 2006). Sound business plans based on realistic and properly researched market, product, competitor and strategic analysis give lenders confidence in the competency of the entrepreneur (Fatoki & Odeyemi, 2010) and their ability to adapt to deteriorating conditions (Smit & Watkins, 2012). Other factors that affect this perception are factors like age of firm and owner's experience as prior experience with difficulties can give the impression of a committed entrepreneur with the skills to navigate turbulent times.

Collateral and third-party guarantees

Lenders usually draft the loan contracts to try to minimise their risk exposure to opaque borrowers (Ahiawodzi & Sackey, 2013) by asking for as much information as they can gather up-front. In the absence of good knowledge of conditions, character, capital and capacity, collateral becomes very important. To demonstrate intent and

capability of borrower to repay loan, lenders sometimes require that borrowers pledge some of their assets as security against the loan.

Collateral gives the lender preference over other lenders in the case of bankruptcy (Green, 2003). The value of the assets pledged must exceed the value of the loan required, the margin of which is dependent on the perceived borrower risk, and the aforementioned assets are usually not used to back any other loans. In the loan agreement, all things, such as stock, accounts receivable, equipment and buildings, serving as collateral should be specified clearly to avoid ambiguity (Bhatt, 2012). Lenders ideally prefer the maximum term of the loan to match the useful life of the asset used as collateral such that the ratio of market value of the collateral at least matches the initial ratio of value of collateral to loan amount. The collateral must be easily disposable should the need arise for the lender to recover their money. Third-party guarantees, where someone else acknowledges liability, when the borrower cannot repay the loan are also a form of collateral. This is one of the common forms used by government to address the market failures in the credit market, especially in developing nations. Collateral serves to reduce problems of adverse selection and moral hazard (Menkhoff, Neuberger, & Rungruxsirivorn, 2012), and Berger and Udell (2006) found in small business, it is almost always required up-front by lenders.

For opaque, fledgling, first generation entrepreneurs with poor management training, lenders end up placing a lot of significance on collateral requirements. Menkhoff et al. (2012) found higher collateral is required in emerging markets because of higher information asymmetry and relatively poor enforcement while the ability to provide collateral is lower. Credit rationing is especially severe on previously disadvantaged groups because they usually lack the collateral to pledge against their loans. This results in government interventions in the form of credit institutions, credit programmes and subsidised interest rates being widely implemented in developing nations causing a costly drain on the fiscus (Jia, 2008). South Africa has the Small Enterprise Finance Agency that facilitates and provides small firms with access to finance (Small Enterprise Finance Agency, n.d.).

Despite all these factors being potentially significant, there is not much evidence to conclusively determine whether they are complements or substitutes in influencing lending decisions for small (or large) businesses (Cassar, Ittner, & Cavalluzzo, 2015).

2.4 Borrower characteristics

Banks highlight lack of creditworthy borrowers as the main reason for credit rationing. When any borrower applies for credit, lenders evaluate the merits of lending to that particular borrower. This assessment of creditworthiness is based on profiles the borrowers present to the banks when applying for credit. Perceived risk of default on payments based on information or lack thereof, about prospective borrowers or their projects that lenders collect during the application process is the basis for the credit rationing.

The challenge with borrower characteristics, particularly when dealing with small firms, is unavailability of reliable information to evaluate the borrowers' creditworthiness. Credit rationing is a consequence of lenders' credit risk management; it involves allocation of credit to the most profitable borrowers. To determine the profitable borrowers with a fair amount of certainty, lenders collect as much information as they can about the borrowers or their projects to improve their understanding of the loan risks, the borrower's financial position and integrity. An evaluation framework that is regularly used is the Five C's of Credit: Capacity, Capital, Collateral, Conditions and Character (Bhatt, 2012; OECD, 2006).

Lenders need to predict the capacity of the borrower to meet the agreed repayments and their timing. In so doing, the lenders will consider the cash flow from the business, the timing of repayment, and the probability of successful repayment of the loan. Information asymmetries can arise because lenders might not have as much information as the borrower in terms of the borrower's true financial capacity.

The money that the entrepreneur or small business owner has invested in the business is called capital (Bhatt, 2012). It is the business owner's money that is at risk should the business fail, and is a reflection of their commitment to the business

venture. Capital serves to mitigate moral hazard and encourages the owner to strive for the business or project's success.

Collateral is a security for the lender against the credit advanced (Bhatt, 2012). Lenders usually require collateral as insurance in case the borrower cannot repay the loan. Should the borrower default on the loan, the lender will take possession of the collateral as a substitute for the outstanding debt. It also serves to mitigate moral hazard. The perception of the riskiness of the loan decreases as the value and quality of the collateral pledged increases (Paligorova & Santos, 2016).

Conditions refer to the proposed objective of the loan, for example, to fund working capital, survival or growth (Bhatt, 2012). They also relate to the macro-economic environment such as local, industry or national environment and/or trends surrounding the business sector in which the business operates (Bhatt, 2012).

Character refers to "a complex of mental and ethical traits marking and often individualising a person, group . . ." (Merriam Webster, n.d.); it is related to the personal obligation a borrower puts on themselves to honour their loan repayments (Bhatt, 2012). Information asymmetries on determining the borrower's character result in the lender making subjective decisions on the borrower's intention to repay the loan.

However, to use the framework, lenders need to have reliable information on which to base their decisions, therein lies the biggest problem of information asymmetries.

2.4.1 *Credit Scores*

The willingness (character) and capability (capacity) together constitute the probability of borrowers honouring their repayments, often expressed in terms of a credit score. Credit scoring agencies assign creditworthiness to borrowers by collecting their information, such as credit payment history, business demographics, public information such as liens, judgements, bankruptcy proceedings, which are used to indicate their willingness to honour their loan repayments, and financial information to assess capability to honour the repayments (Cassar et al., 2015).

Credit scoring also considers current outstanding loans and helps give banks an indication of the total credit exposure of potential borrowers (Lenisa, 2012). Credit payment history is an indication of repayment potential, i.e. a history of not paying back loans at all or on time impairs a borrower's credit–score damaging future prospects of getting additional loans. Credit scores are an aggregation of hard and soft information, making them a good tool for addressing the asymmetric information challenge lenders face when lending to small businesses.

Normally, for small businesses, the business as well as the owners' private credit history are considered because the two's finances are rarely kept distinctly apart (Ahiawodzi & Sackey, 2013; Falkena et al., 2001).

Credit agencies' information is usually used by lenders as a primary screening tool and they avail this information, usually at lower administrative costs than the lender would have incurred in gathering the information themselves (Lenisa, 2012). Higher third-party credit scores decrease the likelihood of loan denial (Cassar et al., 2015). Sharing of information between lenders increases repayment rates because borrowers appreciate the effect of a bad credit record on future borrowing potential, in this way, credit bureaux help reduce information asymmetries and promote compliance (Brown & Zehnder, 2007). Credit scores considered "good" vary from lender to lender, however myFICO considers credit scores between 670 and 739 "good", below that range credit scores are considered "fair" or "poor" if much lower, whereas above the range credit scores are "very good" or "excellent" if much higher (Fair Isaac Corporation, n.d.).

The absence of (Andrianova et al., 2015) or shortness (Ferretti, 2016) of credit records for small firms and their owners at the credit bureaux complicates the screening of their applications when they apply for funding. Small businesses' inactivity in the formal sector means credit bureaux usually only get access to financial indiscretions that concern these small businesses while their credit-positive behaviour is not captured.

Borrowers can challenge their credit reports with the credit bureaux (World Bank, 2015), adding scrutiny thus improving the quality of the reports which reduces

information asymmetries. This could see more importance being placed on credit reports in loan applications. To take advantage of this scrutiny however, small firms will need to challenge their own credit records to ensure that they reflect information that is accurate.

Credit scores on the other hand, are a better source of information because they are an aggregation of hard and soft information, i.e. in addition to taking into account the capacity; they also consider previous commitment to honour obligations in the form of payment history, pending liens, other outstanding loans.

Credit scores are often used as a pre-screening mechanism to identify creditworthy and solvent borrowers.

Hypothesis 1: The "big four" banks in South Africa will not approve loan applications when the borrowers' credit score is below a critical score.

2.4.2 *Relationships*

The information lenders rely on is defined as hard information or soft information. Soft information refers to the information that is used to determine the integrity of the borrowers. Often soft information is qualitative, not easily obtainable or quantifiable (Ferretti, 2016), making its collection only suited where relationships exist between the lender and borrower. Kiisel (2013) suggests that relationships with bankers are crucial for small firms and such relationships should be built up over time long before the small firm might need to call upon them. Soft information (e.g. strong relationship banking) may be a better source of information about SMEs as they inherently usually lack the required hard information.

The International Finance Corporation (2010) states that loans are rarely behind the profitability of SME banking relationships but are used to attract and retain clients. Better yet, Agostino et al. (2008) suggest multiple banking relationships would be best for the firms as it also gives them ability to compare the product offerings from the different banks and reduces their switching costs if they need to consider another lender.

Borrower type rationing results in lenders turning down some clients they might have an interest in lending to in future, resulting in them being lost for good.

Where information asymmetries are prevalent, it might be worthwhile for lenders to opt for loan-size rationing to keep all borrowers and to facilitate relationship building and collecting borrower information then change to borrower type rationing when the good borrowers have been separated from the bad borrowers (Kirschenmann, 2016). She further states that lenders tend to cherry-pick the good borrowers for building on-going relationships, transforming to borrower type rationing as relations develop and the extent of credit rationing decreases with loan sequences. On the other hand, this might result in borrowers inflating the amounts they borrow so that if they are loan-size rationed, the approved amount will be closer to the desired amount.

Cziráky, Tišma, and Pisarovic (2003) concurred, when they found that among SME loans, banks tend to prefer lending small amounts to small firms, that is, banks do not like lending to small firms, but when they do, they prefer the amounts to be low, i.e. big banks do not necessarily prefer giving big loans, but it depends on to whom they are lending the money. This suggests the relationship between bank size and loan size is not a simple linear one, or it could simply imply that when dealing with smaller opaque firms, banks prefer to spread their risk among the small firms while separating the bad from the good borrowers among the small firms. Despite the relatively higher administrative costs of smaller loans, banks prefer smaller loans to opaque borrowers, i.e. preference for loan type rationing where relationships do not exist or information asymmetries are prevalent, subsequently switching to borrower type rationing when relationships have been established.

Relationship strength can be measured on the basis of the length, breadth or exclusivity of the relationship between the bank and the borrower (Cotugno et al., 2013). As relationship length improves, credit rationing decreases and terms of the loan generally improve because of the reduction of information asymmetry (Cotugno et al., 2013). Firms with single banking relationships (exclusive) or fewer banking relationships (quasi-exclusive) tend to be less exposed to credit rationing because there is lower risk of adverse selection (Cotugno et al., 2013; Ferretti, 2016). Retail banking customers often face high switching costs in moving from one service

provider to another; this tends to promote the exclusivity of their relationship with a bank when it exists the longer it lasts (OECD, 2006). As this exclusivity of the relationship grows, lenders have a competitive advantage over other lenders when it comes to that particular borrower in that they have detailed information of their finances while others still face information asymmetries. Multiple banking relationships were found to be significant in affecting credit rationing of small firms (Agostino et al., 2008).

Decentralised banks give greater autonomy to their branch managers, making them more responsive to "soft" information; as a result they lend more to SMEs because their scale and scope of hard information is often limited (Canales & Nanda, 2012; Grunert & Norden, 2012). Big banks usually tend to be centralised with decision-making credit departments in head offices as opposed to being at branch level for small banks.

Though banks might prefer multi-banking relationships because they spread the lending activity risk, they also make screening and monitoring of borrowers more difficult which causes an inclination of banks towards collateral or third-party guaranteed loans (Ferretti, 2016). Lenders find it beneficial to invest in relationships with clients with no relationships, however if clients have relationships, it becomes more cost effective for banks to acquire that information from third-parties (Agostino et al., 2008; Brown & Zehnder, 2007). Competition in the lending markets reduces the incentive for acquisition of this information and can lead to reckless lending which would likely reduce credit rationing.

Lenders can also rely on the borrower's educational background and experience in business as proxies for borrower character to determine their integrity. The quality of borrower references and the background and experience of employees may also be considered.

Hypothesis 2: When relationships with small firms exist, the major banks in South Africa are more likely to approve the loan application.

2.4.3 *Hard Information*

Lenders try to distinguish good borrowers from bad borrowers by predicting credibility based on information they can collect about the borrowers. Past financial performance is used to predict the ability of the borrower to honour their interest and capital payments. Loan application contracts often require borrowers to provide some kind of financial information (hard information), from simple bank statements or tax declarations to more sophisticated accounting statements prepared using accepted accounting principles (Cassar et al., 2015). Though tax records and financial statements can be substitutes, Minnis and Sutherland (2016) found that they are often both required when information asymmetries are high.

Hard information of small firms is difficult to come across and tends to be subjective when it exists because there is no requirement on it conforming to any governance standards. The accuracy of accounting information presented is dependent on the firm itself and normally small firms are not required to produce audited financial reports, implying the information contained in them is only as good as the firm wants to portray. However, when it does exist and its authenticity is verified, hard information can be used to make debt more accessible or lower interest rates charged (Cassar et al., 2015).

A business' bank (transaction) account history is often held by the bank that provides the business' or owner's current account and is not widely shared. Other banks and alternative finance providers therefore do not have access to the same level of information as the bank with which the business already has a relationship (HM Treasury, 2014); for this reason, banks seem to place more importance on relationships than hard information. The relationship with the business gives the banks reliable hard information on which they are more comfortable to base their creditworthiness appraisal of the business.

The firm's financial accounts, if accurate, demonstrate the financial position of the firm, its ability to generate revenue, service debt, owner commitment (debt-to-equity ratio). Hard information might show financial means to service the loan, with the exception of credit score, it does not necessarily show the integrity of the borrower in

terms of willingness and commitment to service the loan. This is usually reflected in the soft information, which complements the hard information and is usually part of the credit score or is derived from relationship banking (Cassar et al., 2015).

Though Cassar et al. (2015) found higher quality accounting information prepared using more sophisticated accounting methods does not have any impact on increasing access to credit, Ferretti (2016) suggests it is the reliability of these financial statements that is more important than their mere presence.

Tax records only provide a record of the individual / firm's financial means but they can sometimes be understated to avoid paying taxes. When there is a perception of increased scrutiny, tighter regulation and higher taxation when small firms become transparent and not much perceived benefit in formalising the business, small firms would have no incentive to become more formal and reduce the information asymmetries that exist (OECD, 2006); that is they remain informal with no reliable financial records, or formal record of being creditworthy borrowers with the credit bureaux. Many of the small firms operate in the informal sector without documents e.g. company registration, land titles or formal address, which increases the costs and risks of such borrowers for lenders (Beck & Cull, 2013).

According to Van Aardt and Bezuidenhout (2014), banks use well-reasoned business plans as a screening tool when dealing with small business loan applications. This means, the business plan in itself would not be adequate in getting the small business a loan, but its absence can lead to unsuccessful loan applications. Fatoki and Odeyemi (2010) found that the presence of business plans was associated with a significant improvement in loan application success in South Africa.

Big banks put a lot of emphasis on hard information in granting credit (Agostino et al., 2008) making them less suited to South African small businesses where most are opaque enterprises (Agostino et al., 2008; Beck & Cull, 2013). When centralised banks dominate the market, this can hinder financial development especially credit access for SMEs.

Big banks are stronger when it comes to screening techniques on credit applications, these screening techniques favour organisations with hard information, typically the

big companies, on the contrary, smaller banks tend to be stronger on soft information making them more attractive to smaller firms (Agostino et al., 2008). Thus big banks would less likely credit ration big firms and likewise smaller banks are less likely to credit ration small firms.

Hypothesis 3: When small firms present hard information to banks, their loan applications are more likely to succeed.

2.4.4 *Collateral and third-party guarantees*

Collateral can also be used to screen applicants with those with safer projects being more willing to accept increased collateral requirements for lower interest rates (Agostino et al., 2008; Cassar et al., 2015). This is because their willingness to accept higher collateral requirements is an indication to the bank of their confidence in their own business, their willingness and ability to repay the loan by taking on most of the risk themselves, which the bank compensates by charging a lower interest rate.

Collateral is less often required if there are substitutes such as third-party guarantees, pledged savings, close relationships, interpersonal trust (Berger & Udell, 1995; Cassar et al., 2015; Menkhoff et al., 2012). This supports the notion of collateral as security, i.e. when good quality collateral is available, the borrowers assume the risk of the loan from the lender onto themselves; that is, collateral located in high crime areas is often loathed by the banks (Fatoki & Van Aardt Smit, 2011). In addition to that, they prefer assets that can be easily and inexpensively liquidated, and that maintain their value over the duration of the loan contract.

According to Comeig, Del Brio, and Fernandez-Blanco (2014), lower risk borrowers tended to prefer low interest loans backed by real estate collateral when compared to higher risk borrowers, because real estate collateral cannot be pledged to multiple parties without their knowledge (Minnis & Sutherland, 2016). However, Agostino et al. (2008) argue inability to offer collateral is not a significant factor in credit rationing of small firms, instead they propose that lack of multiple banking relationships is a more significant factor.

Better education is found to be related to less collateral requirements (Menkhoff et al., 2012), suggesting it could be a complementary to collateral or a substitute.

Menkhoff et al. (2012) found because collateral reduces the problems of adverse selection and moral hazard, demand for it decreases as relationship banking, third-party guarantees or better education improve. Higher third-party credit scores decrease the likelihood of loan denial and collateral is still seen as the biggest driver of loan success rate where information asymmetries exist (Cassar et al., 2015). Lack of collateral and credit history make it almost impossible to access credit from formal sources because of information asymmetries.

Berger and Udell (1995) also found that demand for collateral and interest rate granted tend to decrease with increasing relationship between the lender and borrower (OECD, 2006).

Ferretti (2016) and Kirschenmann (2016) argue that collateral can act as a substitute for reducing information asymmetry. For small businesses, because hard information is usually lacking and relationship banking is not well developed, Menkhoff et al. (2012) and Minnis and Sutherland (2016), quoting Bester (1987), argue this makes collateral the primary substitute for information asymmetry. However, Minnis and Sutherland (2016) also cite the Rajan and Winton (1995) finding that provision of collateral actually leads to an increased demand for monitoring (in the form of financial records or relationships), as lenders need to be assured of the value of the collateral pledged over the term of the loan. There is not much information on the classification of this hard and soft information as substitutes or complements to reducing information asymmetries.

Green (2003) and Mazanai and Fatoki (2012) highlight high administrative costs as a hindrance to banks accessing the small scale borrower information resulting in high-default risk perception of small scale borrowers and their persistent failure to offer collateral as main reasons for them being credit rationed.

The informal nature of small businesses and lack of relationships with lenders of their owners normally means that lenders will only lend them funds if they can provide good quality collateral or third-party guarantees corresponding to the loan amount

and term. This makes collateral seem like the most significant factor in determining loan application outcomes.

Hypothesis 4: Small firms' loan applications are likely to succeed in the presence of adequate collateral or third-party guarantees alone.

2.5 Conclusion of Literature Review

This chapter defined credit rationing and discussed the factors affecting credit rationing of the small businesses by the big banks. This was followed by a discussion of the borrower characteristics affecting credit rationing, from which the following hypothesis to be tested were derived.

2.5.1 *Hypothesis 1:*

The "big four" banks in South Africa will not approve loan applications when the borrowers' credit score is below a critical score.

2.5.2 *Hypothesis 2:*

When relationships with small firms exist, the major banks in South Africa are more likely to approve the loan application.

2.5.3 *Hypothesis 3:*

When small firms present hard information to banks, their loan applications are more likely to succeed.

2.5.4 *Hypothesis 4:*

Small firms' loan applications are likely to succeed in the presence of adequate collateral or third-party guarantees alone.

CHAPTER 3. RESEARCH METHODOLOGY

The following chapter discusses the research methodology for the study. It discusses how the research was done to address the hypotheses that were proposed as possible solutions to the sub-problems highlighted in the literature review.

Section 3.1 discusses the research paradigm and methods selected, justifying their appropriateness for this study. The assumptions of the selected methodology are also discussed in relation to the research.

Section 3.2 outlines the research design by describing the methodological approach adopted and its suitability. The advantages and disadvantages of this method to the current research are highlighted.

Section 3.3 defines the population for the research and its relevance for the study. The sample and sampling method, including the number in the sample and its appropriateness is also discussed. Potential respondents or sources of the information are stated, without names or personal identifiers for confidentiality reasons.

Section 3.4 discusses the research instrument that was used, indicating how the different parts of the instrument addressed specific issues on the research. A copy of the actual instrument is included in the appendix, together with a covering letter to potential respondents encouraging them to participate.

Section 3.5 details how the data was collected using the instrument.

Section 3.6 describes the methodological data analysis techniques and how the methods were applied in the analysis.

The potential weaknesses of the methodology, sampling, and analysis methods used in the study are stated in Section 3.7.

Section 3.8 defines reliability and validity in the context of this study before discussing how reliability, internal and external validity were achieved or maximised if they could not be achieved.

3.1 Research methodology /paradigm

The study took a quantitative approach since it emphasised quantification in the collection and analysis of the data (Bryman & Bell, 2015). It considered the factors highlighted from the literature and assessed their impact on the outcome of loan applications by small firms at the major banks (Creswell, 2003). The researcher was removed from the data collection in this method, thus could only make interpretations from the collected data such that the outcome of the study should be replicable by a different researcher given the same dataset (Blaxter, Hughes, & Tight, 2010), implying the process is more objective. Quantitative approaches are more objective than qualitative methods since they rely on objective data gathered, and the influence of the researcher's bias and interpretations are lower.

Being a cross-sectional study, steady state conditions were assumed over the period that the data was collected (Blaxter et al., 2010) i.e. there were no external shocks affecting the outcome of the loan applications.

However, the survey respondents' understanding of the survey questionnaire might have differed from the researcher's intended meaning (Hathaway, 1995), implying a mismatch in some responses causing skewed statistical analyses.

Though quantitative methodology is mostly used for theory testing, it can also be used for theory generation (Blaxter et al., 2010). This study tested borrower type credit rationing theory against the data collected from a survey of small business owners who have applied for credit in South Africa. This study was deductive in nature, meaning it was unlikely to unveil new factors that literature had not identified instead it tested theories that have been drawn from the literature review using the data collected (Creswell, 2003).

The thinking was, given the known conditions under which the data was collected, it should be possible to predict the outcome of a loan application for a particular borrower possessing specific characteristics.

3.2 Quantitative Research Design

The study took a postpositive approach which contends that the findings from a study are not the absolute truth (Callaghan & Lazard, 2011), but are supported by the data collected. Postpositivity cannot declare absolute truths because absolute truths are not known and outliers can invalidate the theory. As such, a null hypothesis which is normally contrary to what is to be proven or disproved is proposed and the sample data is used to test this null hypothesis. A null hypothesis is generally a default position of no relationship between the dependent variable and the independent variables (Everitt & Skrondal, 2002). If the data supports rejecting the null hypothesis then the alternate hypothesis is accepted and if the data does not support rejecting the null hypothesis then the alternate hypothesis cannot be adopted.

This deductive approach is to seek reasons to fail to reject a hypothesis derived from literature as opposed to proving a hypothesis by rejecting false beliefs (Creswell, 2003; Miller, 2004).

As a cross-sectional study, specific primary source data of small firms that applied for credit from any the four major banks in South Africa within a 3-year period, was collected by a survey questionnaire. The cross-sectional approach analysed the impact, if any, of the factors collected in determining credit rationing at a specific point in time and not the trend of how these impacts change with time as would a longitudinal study (Bell, 2014). As such, the study inherently did not nor intend to, assess the impact of change of any of the identified factors on small business loan application outcome because it only analysed a snapshot (Mbwambo, Emidi, Mgabo, Sigall, & Kajeguka, 2017).

The research design acknowledges and caters for variability which occurs in three forms, systematic, error and extraneous (McMillan & Schumacher, 2001). Systematic variability ideally should be high so that significance of relationships, where they

exist, can be obtained. Error variability was minimised by choosing a relatively short time period for analysis that did not experience any significant external shocks, to mimic steady-state conditions. Lengthening the period over which the data was collected could have increased the number of responses obtained, which would have increased reliability of the analysis. However, the ability of respondents to remember their particular statuses when the loan applications were made decreases with time. This implies the validity of some of the responses from respondents who applied for loans longer than three years ago would be lower than those who had applied recently.

This method highlighted historical findings that could be used to predict likely outcomes of future applications if there are no fundamental changes in the credit allocation behaviours to small businesses. Past credit-allocation behaviour of major banks is assumed to predict future credit allocation behaviours.

Extraneous variability is identified if it exists in data analysis by identifying correlation between the independent variables (McMillan & Schumacher, 2001). That is when independent variables are related then the effect of each independent variable on the dependent variable cannot be clearly determined because it is masked by interference from the other related independent variables.

Wright (2005) states the advantages of an online survey method include access to potential respondents located far from the researcher, the ability to reach difficult to contact participants, and the convenience of having automated data collection, which reduces researcher time and effort. The disadvantages he highlights are uncertainty over the validity of the data and sampling issues, and concerns surrounding the design, implementation, and evaluation of an online survey.

3.3 Population and sample

3.3.1 *Population*

The small firms analysed were drawn from all sectors of industry across the whole of South Africa, drawn from the purposively chosen “big four” banks. In the context of

this study, small firms are companies employing fewer than 100 permanent staff and whose annual revenue does not exceed R5 million. The population consisted of respondents who satisfied the revenue and staff complement criteria who had applied for a loan at any of the big four banks in the last three years. To ensure that respondents satisfied this definition of small firms, the first part of the questionnaire consisted of some screening questions.

All further analysis was based on each particular respondent's application factors and the outcome of the application whilst intentionally excluding any applicant identifying information. The online survey full dataset though will be kept secure by the researcher for a period of three years, to adhere to university guidelines, after which it will be destroyed.

The impact of extraneous variables can be reduced by randomisation (Kalof, Dan, & Dietz, 2008) where a large number of samples are collected. However, because the sampling is not purely probabilistic on the whole population, the population do not all get an equal chance of being picked in the sample. Even after being picked in the sample, some might chose not to respond, thus the randomisation is still prone to biased sampling.

3.3.2 *Sample and sampling method*

Hair, Black, Babin, Anderson, and Tatham (2010) suggest the minimum number of observations per variable for multilinear regression is five while ideally 10 to 15 observations per variables should be used for analysis. However, for logistic regressions, there are no agreed optimum observations but the 1 in 10 rule suggests that for every 10 events in the data (i.e. loan application success or decline whichever is the smaller of the two), one independent variable can be studied without overfitting the model (Harrell, Lee, & Mark, 1996). Overfitting causes power effects which are caused by using too many observations in the analysis, resulting in insignificant effects appearing to be statistically significant (Harrell et al., 1996). However, Vittinghoff and McCulloch (2007) propose this rule can be relaxed to between five and nine events per independent variable. This suggests that if there is

an even split in the loan outcomes, as in the current data, the minimum adequate sample size can be 40 responses to address the four proposed hypotheses.

Bergtold, Yeager, and Featherstone (2011) found that the effect of small sample size might not be as large as previously thought, implying that with proper sampling logistic regression can be carried out with small samples as well. However, as sample size increases, the bias in the logistic regression estimate decreases (Bergtold et al., 2011), i.e. suggesting large samples are ideal for reducing bias. Studies with small sample sizes tend to overestimate the effect measure (Nemes, Jonasson, Genell, & Steineck, 2009).

3.4 The research instrument

The study used a questionnaire that was distributed via email, text and social media and participation was voluntary. All respondents were asked the same questions, thus collecting the same information about them all (Blaxter et al., 2010). This resulted in the data collected being of lower quality compared to if it had been continuous data. The survey questionnaire consisted of screening questions that were used to ensure that only small businesses' responses were considered in the research. The rest of the instrument consisted of questions to determine the respondents' credit score, relationship with banks, availability of hard information, collateral or third-party guarantees and the outcome of the loan application. A sample of the research instrument is attached in Appendix A.

The format of the questionnaire itself was multiple choice and short answer ordinal answers to reduce complexity and guide the respondents on the type of responses required, i.e. close-ended (Blaxter et al., 2010). The questionnaire standardised the questions posed and consequently the format of the responses, i.e. though surveys allow for long or detailed responses, none of the questions required them. This study intentionally limited responses to closed-type multiple-choice type or metric answers only as a way of shortening the questionnaire completion time to keep the respondents focused. This potentially minimises misinterpretation of some of the

survey questions by the respondents, since their responses are restricted to either a selection or only numbers.

All the responses were collected from the online questionnaire which was distributed by email, WhatsApp and direct LinkedIn messages. Face-to-face interactions with some small business owners did not yield any useful responses as they mostly stated they had not applied for any loans within the last three years.

An online survey questionnaire format was selected for data collection because surveys are relatively inexpensive to administer. It should not be expensive to send the same instrument to a large number of people, implying there is consistency in the questions posed to the respondents, increasing the reliability of the responses. This allows the respondents to complete the surveys at their own convenience. However, this convenience comes at a cost as response rates from surveys plunge. Surveys enable a lot of data to be collected fairly quickly if the response rate is good (Blaxter et al., 2010). Follow-ups to the initial invitation to the survey were done to possibly improve the survey response rates.

Online web surveys also had added benefits of ease of implementation such as including reminders (De Bruijne & Wijnant, 2014), and inbuilt data compilation. One of the major reasons for choosing this method was to respect respondents' privacy as no individual identifying information was requested; this meant any potential respondent who believed they were not the only person taking part in the survey knew the information they provide could not be linked to them or their business.

Survey format questionnaires, by their nature, require the respondents to be able to read and write (or in the case of online and mobile surveys, to type). Since questionnaires were circulated in English only, respondents had to be able to read and understand English, this was assumed to be a reasonable assumption as Chen and Rensleigh (2009) found that though home languages are diverse among small business owners, the large majority preferred English as the language of business.

Quarterly data from the National Credit Regulator (2017) shows that less than 1% of credit active South Africans are aware of their credit scores. Asking respondents to enquire their credit score from the local credit bureaux first before participating in the

survey might have led to a further drop in the response rate. South African credit bureaux generally require the respondent's national identity number in order to determine their credit score. Asking for respondent's consent to obtain their credit scores on their behalf was considered, but abandoned as this would have voided the anonymity pledge that was included to encourage participation.

The credit scoring questions asked in the questionnaire were adapted from MyFico (www.myfico.com) and respondents' responses were entered onto the website that returned a credit score range. The median of the range was calculated as a proxy of the respondents' credit score. This credit score will not be the respondents' actual credit score according to local credit agencies (like TransUnion) but it will be a proxy for the actual score and for the purposes of the study sufficed. For the purposes of this credit score determination, an average South African Rand to United States Dollar exchange rate of ZAR13: USD1 was used (South African Reserve Bank, 2018).

The rest of the instrument asked specific questions relating to the research hypotheses which have been derived from literature (Hathaway, 1995). Truthfulness and accuracy of the data collected by survey method cannot be easily verified (Blaxter et al., 2010) though online questionnaires get more honest responses than other methods of data collection.

Though Blaxter et al. (2010) suggest that email and online surveys receive low response rates, most of the responses in this study were from email responses, maybe because business owners were reluctant to answer questions they thought might be sensitive information. Hence, they might have been more comfortable answering the questions on an online survey where none of their identifying particulars were required and the researcher would not know from whom the response came.

3.5 Procedure for data collection

The borrower characteristics analysed for correlation to loan outcomes are;

- perceived risk of default (credit score),

- existing relationship (personal or business) with the bank,
- availability of hard information e.g. financial records, and
- available security as collateral or third-party guarantees (Hwarire, 2012).

The surveys were distributed as online surveys and mobile surveys via targeted emails to businesses that likely fit the profile of small businesses (less than R5 m in revenue and less than 20 employees). Use was also made of the researcher's primary and secondary networks using channels like the Wits Business School, LinkedIn, WhatsApp and Twitter. These channels all took the same format consisting of an introductory note with details about the research and a direct link to the research questionnaire, which could be accessed online or on mobile devices. Online and mobile survey responses were immediately captured in the survey tool, Qualtrics.

3.6 Data analysis and interpretation

The data were inspected for completeness and when the loan application outcome (dependent variable) was missing, the observation was omitted from the dataset for analysis. The data collection instrument did not allow proceeding or submission of responses without answering all questions in full.

Multi-row datasets could have been caused by some small firms completing the questionnaire in duplicate for the same loan application (Lee, 2015).

3.6.1 *Logistic Regression Technique*

The nature of the dependent and independent variables being analysed dictated the type of statistical method used (Hair et al., 2010).

Credit scores were not used in the logistic regression model as is, instead a dummy categorical variable was created to address the two classes of credit score; those above the critical score and those equal to or below that critical score. This dummy variable, *CrdtRt*, is a dichotomous categorical variable. Existence of relationship

between the applicant and the bank is also a dichotomous categorical variable, as is presence of hard information or collateral or third-party guarantees.

This meant that all independent variables and the dependent variable in the regression model are dichotomous categorical variables. By converting the dependent variable (loan outcome) to a binary variable, a logistic regression model can be used to investigate correlation (Hair et al., 2010; Marshall & Boggis, 2016), and determine the correlation of each of the independent variables (borrower characteristics) on loan application outcome (Hair et al., 2010; Lee, 2015).

Other techniques that can be considered when the dependent variable is dichotomous are probit regression, complimentary log-log model and loglinear model (Allison, 2012). Complimentary log-log model is more suited to continuous time models for the occurrence of events since, unlike logit and probit models, it is not symmetrical around $p = 0.50$ (Allison, 2012). Loglinear is suited when there is no explicit dependent variable (Agresti, 2002; Allison, 2012) and hence was not be used since the dependent variable was explicit. The results from logistic and probit methods are usually close with distinctions only occurring when sample sizes are very large (Damisa et al., 2017; Hahn & Soyer, 2005). The logistic coefficients are often about 1.8 times the probit coefficients because the logit transformation covers a wider range for any given change in probabilities (Allison, 2012). This difference though is usually of no material significance and similar conclusions are derived regardless of the method used (Allison, 2012). The Logistic regression technique was selected for convenience because its coefficients are easier to interpret using the odds ratios, which are not affected by sampling on the dependent variable (Allison, 2012; Damisa et al., 2017).

Binary logistic regressions are not subject to the same restrictive assumptions as linear regressions. Thus, there is no need to test the assumptions on linearity, normality and equal variances, nor do the error variances need to be normally distributed (Allison, 2012; Tabachnick & Fidell, 2012).

Single independent variable logistic regression models use the function (Agresti, 2002; Allison, 2012; Hosmer & Stanley, 2000) in Equation 1.

$$E(Y|x) = \frac{e^{\beta_0+\beta_1 x}}{1+e^{\beta_0+\beta_1 x}} = \pi(x)$$ **Equation 1**

Where $E(Y|x)$ is the expected value of Y (dependent variable) given a value of x (independent variable). This function gives $E(Y|x)$ values between 0 and 1 for all values of x. Applying a logit transformation to Equation 1, gives

$$g(x) = \ln\left[\frac{\pi(x)}{1-\pi(x)}\right] = \beta_0 + \beta_1 x$$ **Equation 2**

This transformed logit function has similarities to linear regression models.

For multivariate logistic models, Equation 2 becomes

$$g(X) = \beta_0 + \sum_{i=1}^{n} \beta_i x_i$$ **Equation 3**

where X represents the whole set of *i* covariates upto x_i.

However, in linear regression models, the model parameters (β_0, β_1 to β_i) are determined using the least squares method. With logistic regression models, the model parameters are determined using the maximum likelihood estimates method which maximises the probability of matching the observed results to the predicted results (Hosmer & Stanley, 2000) because of the use of individual-level data (Allison, 2012).

The logistic regression method predicts the probability of observations' outcome as values between 0 and 1. These probabilities determine predicted loan application outcome, with probabilities between 0 and 0.5 implying predicted unsuccessful loan applications, similarly probabilities from 0.5 up to 1 imply predicted successful loan applications (Hair et al., 2010).

SAS University Edition was used for data analysis using the default Binary Logit model and Fisher's scoring optimisation technique.

3.6.2 *Description of Variables*

Collateral (*Collt*) variable represented the presence or absence of collateral when the loan application was made.

Credit Rating (*CrdtRt*) was introduced as a dichotomous dummy variable with only two states 'Good' and 'Bad'. A critical credit score of 685 which falls within the "good range" when using the myFICO credit classification (Fair Isaac Corporation, n.d.) was selected as it gave the best contrast of loan outcomes for scores above and below it. All Credit Scores above 685 where given a CrdtRt value of "Good", whereas "Bad" corresponded to Credit Scores equal to or below 685.

Relationship (*Relxn*) variable indicated whether the loan applicant had a prior existing relationship with the bank from which they applied for the loan or not.

Hard Information (*Hard_All*) is also a dichotomous variable representing if the applicant had presented any documented information about the financial state of the business in the form of financial statements, audited financial statements, business plan or tax records to the banks.

Collt, *Relxn* and *Hard_All* are also dichotomous variables taking a state of 'Yes' when present and 'No' when not present, as in Table 1.

Table 1 Class level information

Class	*Value*	*Design Variables*
CollI	*No*	0
	Yes	1
CrdtRt	*Bad*	0
	Good	1
Relxn	*No*	0
	Yes	1
Hard_All	*No*	0
	Yes	1

3.7 Limitations of the study

The analysis of quantitative data, though objective in its results, has the weakness of missing out on contextual detail that could be obtained in a qualitative study with follow-up questions (Creswell, 2003). The studies can be time consuming, requiring data collection over longer periods of time and some demographic groups may be more difficult to reach for the researcher, impacting the respondents' representativeness of the population (Goertzen, 2017).

Most people in South Africa are not aware of their own credit scores and asking for the respondent's credit score directly in the survey would most likely have drawn no responses or incomplete responses. Credit bureaus will require identification particulars, such as national identity number, to be able to give the credit score and the research intentionally avoided asking such questions as they might have reduced the response rate to the questionnaire further. Asking for respondents' national identity number and permission for the researcher to access their credit scores from the Credit bureaux would also have limited the survey response rate in light of the identity theft problem.

3.8 Validity and reliability

In quantitative studies, validity is the accuracy of measuring a concept (Heale & Twycross, 2015). Bryman and Bell (2015) state that when reliability and validity have been demonstrated, the results from a deductive research are generalisable. The aim of quantitative research studies is to generalise findings from the current study to a universal population. Johnston (2014), citing Magee, Lee, Giuliano, and Munro (2006), states that the literature review and the data collection process inform the issues of validity and reliability. Construct validity considers if the variables observed actually measure what they are intended to measure (Bell, 2014).

The use of an independent online determination of credit score might result in a different credit score to the credit score as per South African credit bureaux or the local banks' internal credit scoring methods. In addition, there is a risk of a self-reporting bias, either consciously, as borrowers attempt to portray themselves as unfairly denied loans, or unconsciously, as borrowers at times are not aware of some of their obligations. The true credit score therefore is generally suspected to be worse than the credit score used in the study.

The measurement of borrower-bank relationship using the length of relationship alone disregards the depth or quality of the relationship which might include the existence of prior loan repayment behaviour. The exclusivity of the relationship can be assessed by investigating the existence of other banking relationships.

The study assumes the effect of other extraneous factors that might affect the outcome of loan applications is random and non-systematic (Hair et al., 2010) such that their effect is of no material consequence to the results of the study.

Reliability, on the other hand, is the consistency of the measures (Hair et al., 2010; Heale & Twycross, 2015). The importance of analysing a high number of credit applications is to smoothe out random inconsistencies and implies that the overall lending behaviour is explained by only the selected variables.

Online surveys can produce unreliable, inaccurate and biased data (Duda & Nobile, 2010). For a sample to be unbiased and representative, all components of the

population must have an equal chance of participation (Duda & Nobile, 2010). This is sample validity, and it is affected by many factors, including access to all small business owners' email addresses or phone numbers. Some invitations to participate were posted on the social media site 'Twitter' and the professional networking platform 'LinkedIn'. However, even with such public invitations, small business owners who are not within the researcher's primary and secondary networks in all likelihood did not get a similar chance of participation.

The survey targets small business owners in South Africa, hence it is a closed population survey where the respondents are self-selected and there is no control over who can participate (Duda & Nobile, 2010).

Stakeholder bias can also affect the reliability of the results where some people with a vested interest in the survey can complete the questionnaire more than once and urge others with similar experiences or beliefs to theirs to also participate, thus amplifying selection bias (Duda & Nobile, 2010).

The survey had no way of verifying if only small business owners were completing it, besides the few screening questions. For this reason, no incentives were promised for participation in the survey , as this might have exacerbated the problem (Duda & Nobile, 2010).

3.8.1 *External validity*

The circulation of the questionnaire was to a wide spectrum of South African small businesses and the research did not conduct any prior conscious screening of respondents. Unconscious bias in the sample of respondents might have come from access to respondents, i.e. the questionnaire was circulated mostly to small business owners online and via WhatsApp, usually after a face-to-face introduction, but also as cold emails across the country. Volunteer effects might affect how representative of the total population the respondents were (Kalof et al., 2008).

External validity is the validity of generalised (causal) inferences in scientific research, usually as experimental validity based on controlled experiments or the

extent to which results of a study can be generalised to other situations (Bordens & Abbott, 2013; Carlson & Morrison, 2009), like populations (Kalof et al., 2008), across populations, contexts and times (Lund Research, 2012a). By recognising the effects of other extraneous variables, the study seeks to minimise their effect. Bias in the various aspects of the methodology (populations, definitions, data collection instrument, interpretation and analysis of the results) is inevitable (Miller, 2004). By detecting and minimising the biases, the research can only probabilistically (Robson & McCartan, 2016) and imperfectly (Miller, 2004) be a generalisation.

The low response rate meant there was no sampling and all valid responses were used in the generation of the logistic regression model, however this meant that without holdout samples to validate the model its external validity could not be assured (Hair et al., 2010). The sample is inherently biased towards respondents with whom the researcher met. Thus, the results are expected to be imperfect but representative of the South African small business population, giving them fair external validity.

The context of this study is South Africa within the periods October 2014 to February 2018, as such, any conclusions relate to this context and any similarities to other similar contexts, though not very surprising, might occur. External reliability cannot be implied without internal validity (Carlson & Morrison, 2009).

3.8.2 *Internal validity*

Internal Validity is the confidence researchers have in inferences regarding cause-effect or causal relationships (Bordens & Abbott, 2013); how well the dependent variable is explained by independent variables only and not by other external factors. Thus, internal validity is only relevant in studies that try to establish a causal relationship; it is not relevant in most observational or descriptive studies, for instance.

Threats to internal validity in the study include (Lund Research, 2012b):

- History effects are external events (not part of the independent variables observed) that happen during the observation period affecting the dependent variable. These have been minimised by selecting a relatively short observation period of relatively stable macro-economic environment and fiscal policy.
- Instrumental bias can occur if the questionnaire does not capture what it is intended to. Mitigation has been through a questionnaire that is mostly short, specific, multiple choice type and short answer questions.
- Selection bias could be a concern as all the respondents were contacted through electronic means (email, social media, etc.) implying small business owners who have restricted access or chose not to use these means often may have been excluded.
- Experimental mortality should not be of concern for this study as the study only captures self-reported experiences of small business owners when they applied for loans at a particular point in time; it is a snapshot survey and is not a longitudinal study.
- Causal time order is not expected to affect the internal validity of the study as the borrower characteristics considered are pre-existing before the loan application is made, thus they always precede the outcome of the loan application.
- No diffusion or compensatory rivalry effects were expected as there was no control group because the original data from the study was collected from observation of events and not a controlled experimental environment.
- Demoralisation can affect the variability of the results as more small businesses who might perceive they have a good chance of successfully applying for a loan will apply, whereas small businesses that have tried before and failed might be discouraged and this might skew the population of small businesses seeking loans from the banks towards more creditworthy ones. The only way this might be addressed is increasing the sample size.

The study would have lower internal validity compared to observations of an experiment type which holds other variables constant while changing the dependent variable (Kalof et al., 2008). Only the demand side factors highlighted above are

considered in this study, but there are other demand side factors, macro-economic and supply side factors that could affect credit application outcomes that we do not control.

Other demand side factors are assumed to be less significant than the factors being studied. The selection of a period of relative macro-economic stability for the data collection was to reduce the likely impact of macro-economic factors on the outcomes of the study. Thus, should the macro-economic environment not change during the period of the study, then the effect of micro-economic environment on outcome of loan applications for small businesses should actually be eliminated.

Supply side factors and any latent differences in the lending behaviour between the major banks are expected to be minimal since the data is collected from all of the big commercial banks in South Africa. Similarly, barring any obvious differences in the lending behaviour between all the banks, supply side factors are also minimised.

The demand side factors considered in the study are by no means the exhaustive list of factors, but instead what literature suggests as the most likely factors. In addition, the variables were not purposively manipulated in controlled conditions to gauge the effect of individual variables, instead data collected from respondents' experiences is statistically analysed to infer correlation.

Causation can only be implied if internal validity is high because other extraneous variables might be explaining the loan application outcome better than the selected independent variables (Minnis & Sutherland, 2016). Thus internal validity in this study is low because there was no control group against which to test the findings (Carlson & Morrison, 2009). If the questionnaire had attracted a high response rate to warrant sampling of observations for model building, a sample of the rest of the observations not used in model building could have been used to test the model and thus given it higher internal validity.

3.8.3 *Reliability*

It was expected that the reliability of the data would be good because the responses required were in the form of multiple choice or short format answers, which should have minimised any misinterpretation of the questions. Furthermore, units of periods of time and currency used were specified at the specific questions and mostly consistent throughout the questionnaire. Only considering responses from the last three years also minimised the risk of inaccurate data, as a result of failure to recall. For these reasons, each respondent's responses to the questionnaire would be expected to be the same if they were to answer the questionnaire several times giving it high reliability (Saunders, Lewis, & Thornhill, 2009).

However, participant bias may affect the results as small businesses that have given up on formal financing might be less likely to complete the questionnaire (Saunders et al., 2009) hence their own specific characteristics would not be captured. This was mitigated by sending follow-ups on the initial invitation to participate in the survey to increase participation rates.

Population specification error is when the wrong target group responds to the questionnaire, for example, non-small business owners or owners of small businesses outside South Africa, this was controlled for in the questionnaire using the screening questions as well as clearly stating in the introductory note who the target respondents were.

Sample frame error might have existed as a result of the researcher's limited access to a wide spectrum of the small business owners in the country, across various categories of geographic location, background. This was controlled for by extending circulation to beyond immediate networks such as through the faculty office to business owners outside the researcher's own networks, some franchisees, networks of researcher's networks, respondents passing it on further in their own networks, etc. Access to only a small section of the small business owners might have skewed the findings towards characteristics more prevalent in that section of the population.

Sampling errors likely existed because of the low response rate received, at least a ten-fold increase in response rate might have increased the confidence in the minimisation of sampling errors for the data collected.

No data-recovery techniques were attempted where there were incomplete responses because all those respondents abandoned the questionnaire either at the screening stage or at the questions that were used to get their credit score i.e. some explanatory variables were missing as well as the dependent variable itself (SAS Institute Inc, 2008).

CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the statistical logistic regression outputs from the collected observations. Section 4.2 outlines findings from the data collection and logistic regression model inputs. The profile of the responses received and outputs obtained from the SAS logistic regression model used to test the four hypotheses are presented in Section 4.2 followed by a brief discussion of the observations that did not fit the model well. A description of the results as they pertain to the hypotheses about the impact of credit score, relationships, hard information and collateral or third-party guarantees then follows in Sections 4.3, 4.4, 4.5 and 4.6 respectively. The chapter concludes in Section 4.7 with a summary of the results presented.

4.2 Response Summary and Model Outputs

The total number of usable responses was 41 from 49 completed responses. The unusable responses were from businesses that could not be classified as small businesses according to the definition adopted earlier (Section 1.2) for the study i.e. in terms of maximum revenue earned, maximum number of permanent employees or both.

As shown in Table 2, the survey response rate was 1% for cold-emails sent via Survey email, of which none completed the questionnaire. The external link which was often preceded with a face-to-face introduction, and followed up with reminders, resulted in much higher response rate of 30%. Of the 30% who responded, only 44% completed the questionnaire. A few non-respondents who provided feedback stated they had given up on applying for finance from the banks. Of the incomplete responses, about 70% only read the introductory letter and did not proceed further, suggesting they were not part of the target population, i.e. either not based in South Africa nor applied for a loan from any of the big banks in the last three years. About 30% of the respondents answered the first screening questions and dropped out at

the credit history questions, suggesting they were not willing to share their credit profiles in the research even though personal identifying information was not asked.

Table 2 Response profile summary

		Responses		*Incomplete*	
Distribution Channel	*Sent*	*Total*	*Completed*	*Introduction only*	*Screening done*
Survey Email	314	4	0	4	0
External Link (Secondary Email, LinkedIn, WhatsApp)	371	112	49	44	21

4.2.1 *Logistic regression model results*

Table 3 Model information

Response Variable	Loan
Number of Response Levels	2
Model	Binary Logit
Optimisation Technique	Fisher's scoring

Table 4 Loan response profiles shows the response profile of the dependent variable, loan application outcome (*Loan*) only has two possible states, successful (*Loan* =’1’) or unsuccessful (*Loan* =’0’).

Table 4 Loan response profiles

Ordered Value	*Loan*	*Total Frequency*
1	0	20
2	1	21

The *Loan* status modelled was for successful loan applications i.e. *Loan* =’1’.

The logistic regression model utilising the explanatory variables in Table 1 converged, meaning the maximum-likelihood algorithm converged using the default convergence criterion, the relative gradient convergence criterion (GCONV), and the default precision is 10^{-8} as in Table 5.

Table 5 Model convergence status

Convergence criterion (GCONV=1E-8) satisfied.

The model fit statistics detailed in Table 6 are used to compare the relative quality of different statistical models.

Table 6 Model Fit Statistics

Criterion	*Intercept Only*	*Intercept and Covariates*
AIC	58.814	46.482
SC	60.527	55.050
-2 Log L	56.814	36.482

The estimated correlations of the independent variables are tabulated in Table 7**.**

Table 7 Estimated Correlation Matrix

Parameter	*Intercept*	*CollIYes*	*CrdtRtGood*	*RelxnYes*	*Hard_AllYes*
Intercept	1.0000	-0.0014	-0.3567	-0.3535	-0.7238
CollIYes	-0.0014	1.0000	0.1336	-0.1483	-0.2914
CrdtRtGood	-0.3567	0.1336	1.0000	-0.4087	0.2175
RelxnYes	-0.3535	-0.1483	-0.4087	1.0000	-0.1040
Hard_AllYes	-0.7238	-0.2914	0.2175	-0.1040	1.0000

This leads to the testing of the Global null hypothesis to confirm if there is any relationship between any of the explanatory variables (*Collt, CrdtRt, Relxn, Hard_All*) to the dependent variable (*Loan)*, which is done using the Likelihood ratio test, the

efficient score test and the Wald test. The results of the joint significance testing of the explanatory variables are tabulated in Table 8.

Table 8 Testing Global Null Hypothesis: β=0

Test	χ^2	*DF*	*Pr* > χ^2
Likelihood Ratio	20.3320	4	0.0004
Score	16.9456	4	0.0020
Wald	11.4673	4	0.0218

Table 9 lists the parameter estimates, their standard errors, and the results of the p-value for each of the individual explanatory variables. The p-value for the intercept is high (0.8797) whilst the p-values for *Collt* and *CrdtRt* are less than 0.05 (0.0042, 0.0361 respectively) and the p-values for *Relxn* and *Hard_All* parameters are greater than 0.05. Furthermore, the parameter estimates for the *Intercept*, *Collt*, *CrdtRt, Relxn* and *Hard_All* are -0.2544, 2.5455, 2.1157, -1.5661 and -1.2704 respectively.

Table 9 Analysis of Maximum Likelihood Estimates

Parameter		*DF*	*Estimate*	*Standard Error*	*Wald* χ^2	*Pr* > χ^2	*Standardised Estimate*
Intercept		1	-0.2544	1.6805	0.0229	0.8797	
Collt	*Yes*	1	2.5455	0.8902	8.1761	0.0042	0.7102
CrdtRt	*Good*	1	2.1157	1.0097	4.3905	0.0361	0.5600
Relxn	*Yes*	1	-1.5661	1.2741	1.5109	0.2190	-0.3618
Hard_All	*Yes*	1	-1.2704	1.4631	0.7539	0.3852	-0.2104

The confidence intervals were calculated using the Profile Likelihood Confidence intervals method because it generally produces better approximations when sample sizes are small (Allison, 2012). The 95% confidence interval for each of the parameter estimates is obtained by adding and subtracting 1.96 standard errors to the parameter estimate (Allison, 2012) as presented in Table 10. Significantly, it

should be noted that the confidence interval for the *Intercept*, *Relxn* and *Hard_All* parameters includes the value zero.

Table 10 Parameter Estimates and Profile-Likelihood Confidence Intervals

Parameter		*Estimate, β*	*95% Confidence Limits*	
Intercept		-0.2544	-3.4454	3.4614
Collt	*Yes*	2.5455	0.9204	4.4878
CrdtRt	*Good*	2.1157	0.2728	4.3694
Relxn	*Yes*	-1.5661	-4.3871	0.7315
Hard_All	*Yes*	-1.2704	-4.6405	1.5542

These Odds Ratios are presented in Table 11 and visually in Figure 3.

Similarly, it is important to note that the 95% confidence for all Odds ratio estimates except that for *Collt* (Yes vs No) and *CrdtRt* (Good vs bad) include the value 1.

Table 11 Odds Ratio Estimates and Profile-Likelihood Confidence Limits

Effect		*Unit*	*Estimate*	*95% Confidence Limits*	
Collt	*Yes vs No*	1.0000	12.749	2.510	88.927
CrdtRt	*Good vs Bad*	1.0000	8.295	1.314	78.992
Relxn	*Yes vs No*	1.0000	0.209	0.012	2.078
Hard_All	*Yes vs No*	1.0000	0.281	0.010	4.731

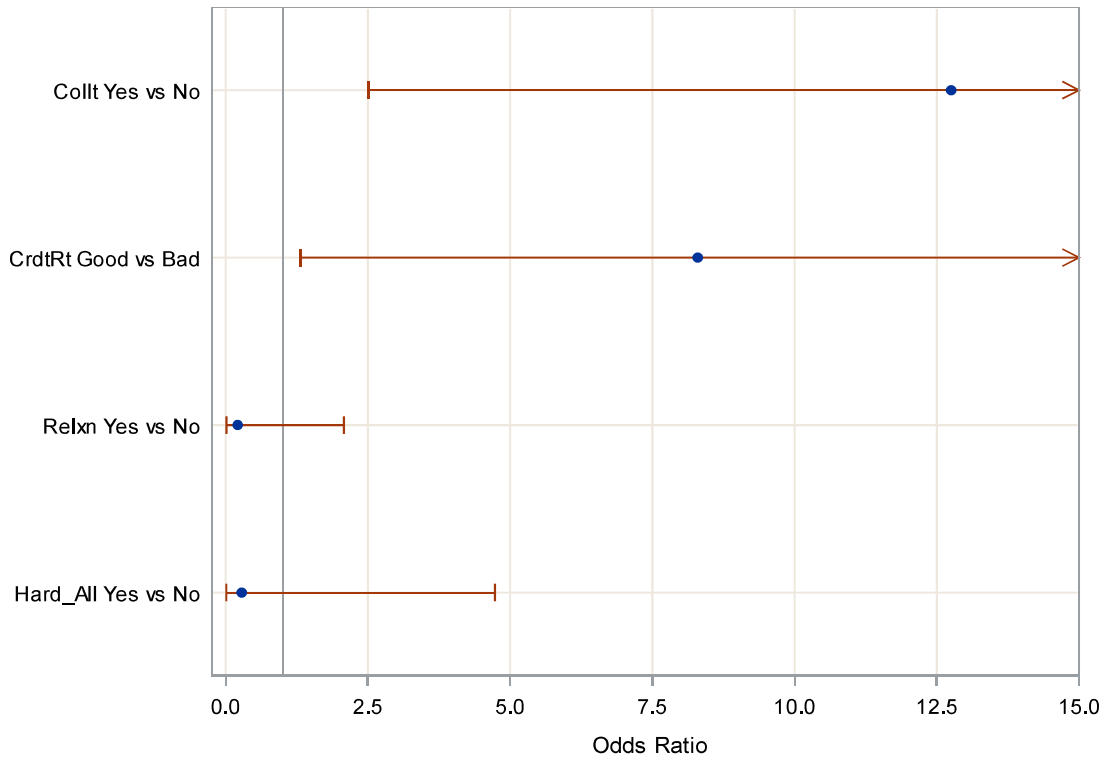


Figure 3 Odds Ratio with 95% Profile Likelihood Confidence Limits

The area under the receiver operating (ROC) curve (0.8679) for the model is shown in Figure 4.

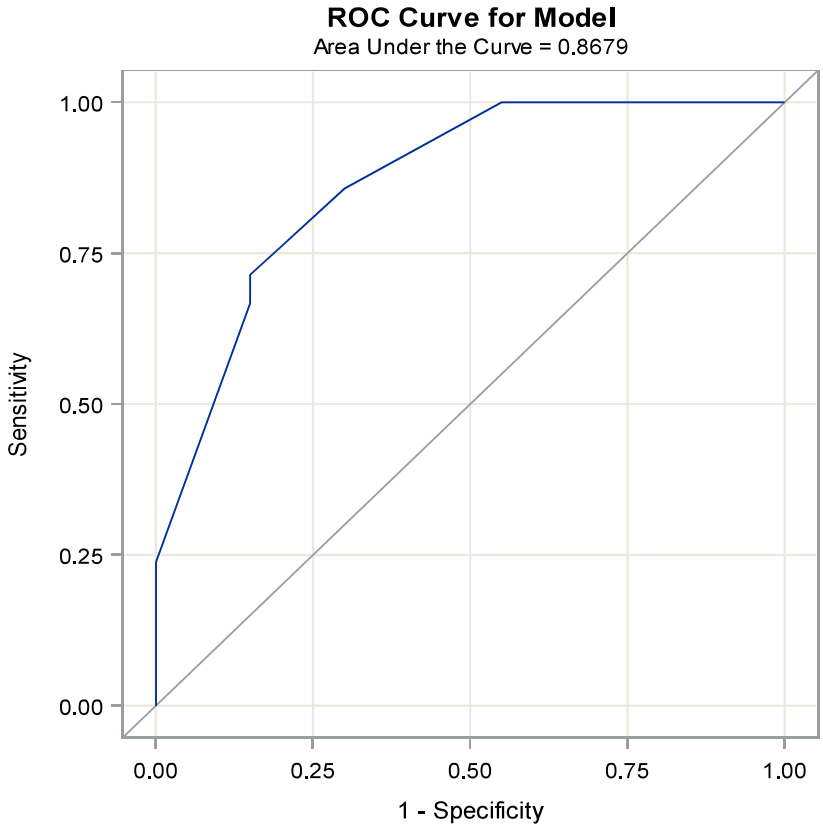


Figure 4 ROC Curve for model

4.2.2 *Influence Diagnostics*

Several measures describe the effect on parameter estimates and fit statistics of removing an observation from the data set.

a) The influence of the individual observations on the impact of each of the explanatory variables on the fitted model is given by the DfBetas or Pearson residuals (SAS Institute Inc, 2008). The Dfbeta for each model parameter is the change in the parameter estimate when the observation is deleted, divided by its standard error (Agresti, 2002). Pearson residuals derived from the Pearson chi-square statistic and Deviance residuals identify observations that are not well explained by the model (SAS Institute Inc, 2008)

b) The confidence interval displacement diagnostic (c) measures the change in a joint confidence interval for the parameters as a result of deleting the observation.

These measurements reflect the quality of each observation in terms of fitting the prediction model derived, with high values of each of these measures corresponding to the observation not fitting the model well.

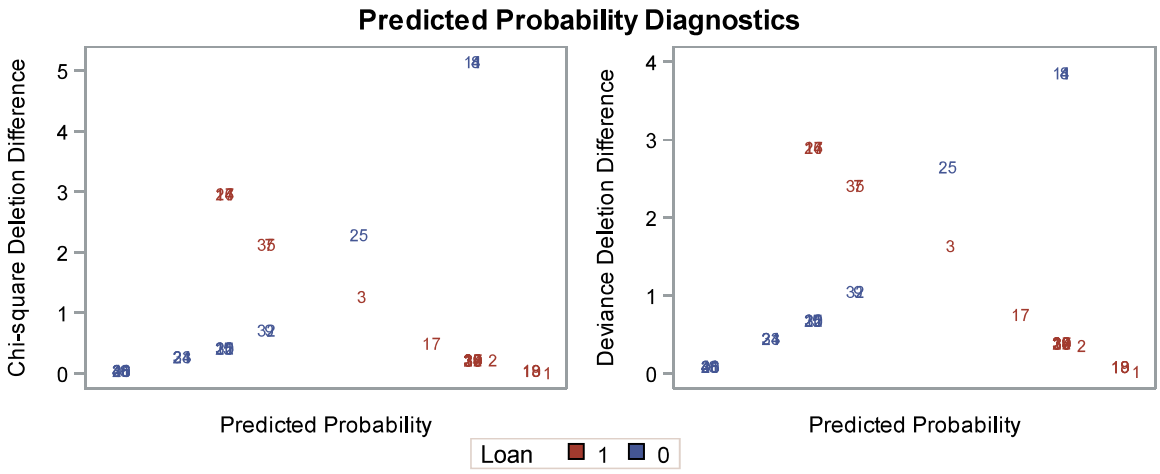


Figure 5 Predicted probability diagnostics

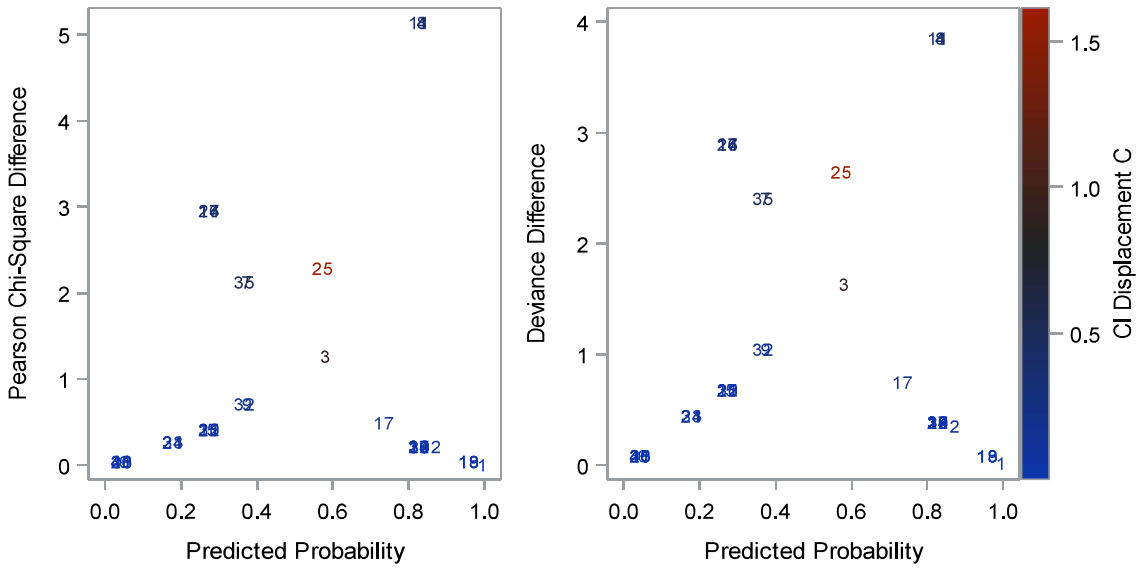


Figure 6 Influence on the Model Fit and Parameter Estimates

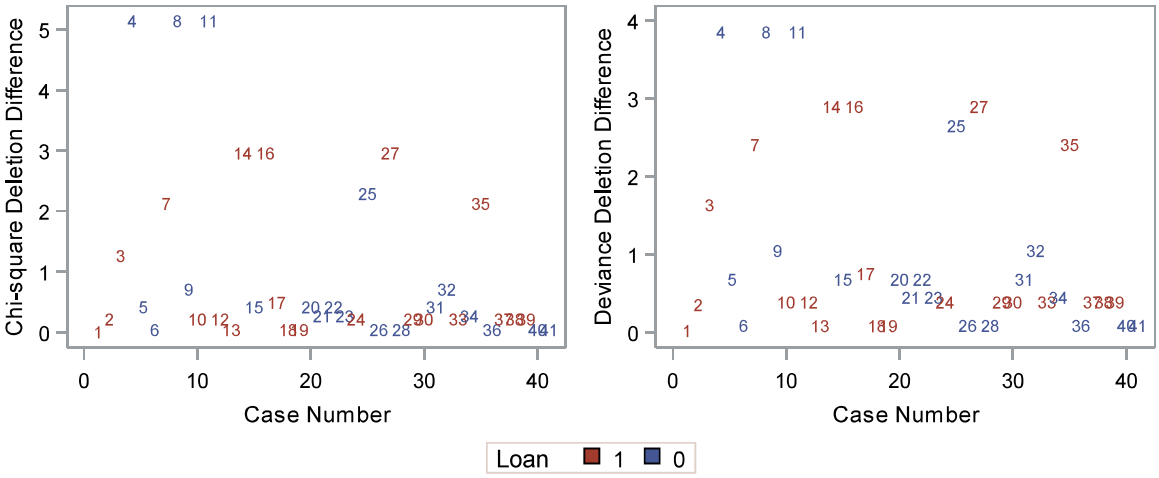


Figure 7 Influence diagnostics

4.3 Results pertaining to Credit Score

The dichotomous dummy variable *CrdtRt* which classifies the Credit Score as either above or below a critical score (685) was used to test the first hypothesis. The p-value of *CrdtRt* (0.0361) in Table 9 was less than 0.05, implying that *CrdtRt* is a

significant parameter in predicting the outcome of loan applications, whilst the maximum likelihood estimate for having a Good *CrdtRt* (Credit score >685) vs Bad *CrdtRt* (Credit Score <=685) is 2.1. The sign of the maximum likelihood estimate shows that that the chances of a loan application's success are better when *CrdtRt* is Good as opposed to Bad.

Agresti (2002) argues confidence intervals are more informative than the results of the Global Null hypothesis tests in interpreting the results of logistic regression. In Table 10, the 95% confidence limits for the *CrdtRt* estimate are between 0.92 and 4.5. This interval excludes the value 0, this is important because at the value 0, the two states of *CrdtRt* are indiscriminate in determining the outcome of loan applications (Hair et al., 2010).

These parameter estimates and 95% confidence limits result in Odds Ratio estimates of Credit Score >685 vs Credit Score <=685 of 8.3 and corresponding Odds Ratio 95% confidence limits of 1.3 to 79 as shown in Table 11 and Figure 3. This means when the *CrdtRt* is Good the odds of a loan application succeeding versus when the *CrdtRt* is Bad are expected to range between 1.3 and 79 at 95% confidence level. When predictor variables are good at predicting the dependent variable, the 95% Confidence limits of those variables' Odds ratio estimates must exclude even odds i.e. the value 1. When even odds are included in the confidence interval of Odds ratio, then the variable is not any better than a random guess in predicting the dependent variable.

The study found that a minimum credit score of 685 improves the chances of a small business's loan application at any of the "big four" banks in South Africa.

The data collected in the study supports Hypothesis 1 that

"*The "big four" banks in South Africa will not approve loan applications when the borrowers' credit score is below a critical score*"

4.4 Results pertaining to Relationships

The data collected in the study resulted in a p-value of *Relxn* (0.219) in the Analysis of Maximum Likelihood Estimates of more than 0.05 as shown in Table 9, implying that the presence or absence of Relationship was a poor predictor for the outcome of loan applications. Whilst the Maximum Likelihood Estimate for having relationship with the bank versus not having relationship with the bank is -1.6, because *Relxn* is a poor predictor of loan applications outcome, the negative sign of the estimate becomes irrelevant.

As a result, Table 10 gives the 95% confidence limits for the *Relxn* estimate at between -4.4 and 0.73. These Parameter Estimates and Profile-Likelihood Confidence Intervals result in Odds ratio estimate of relationship versus no relationship of 0.21 and corresponding 95% confidence limits of 0.012 to 2.1 as shown by Table 11 and Figure 3.

This emphasises the poor performance of having a relationship with the bank versus not having the relationship as a predictor of loan outcomes, because the 95% confidence interval of the parameter estimate includes the value 0. Similarly, the 95% confidence interval odds ratio for having a relationship with the bank versus those of not having a relationship with the bank include even odds (Odds Ratio=1), which demonstrates that there is no significant relationship between relationship presence or absence and the outcome of the loan application. Thus, presence or absence of relationship with the bank is no better than a random guess at predicting the outcome of the loan application.

Thus, the data from the study does not support Hypothesis 2, which states

"*When relationships with small firms exist, the major banks in South Africa are more likely to approve the loan application.*"

4.5 Results pertaining to Hard information

The results for hard information (*Hard_All*) in the form of Financial Statements, Audited Financial Statements, Business Plans or Tax records are presented.

The Analysis of Maximum Likelihood Estimates in Table 9 details the p-value for *Hard_All* as 0.3852, which is greater than 0.05, making availability or non-availability of hard information in any format a poor predictor for the outcome of loan applications. The Maximum Likelihood Estimates for having hard information in any of the formats above versus not having it is -1.3. The negative sign of the estimate also becomes irrelevant because *Hard_All* is a poor predictor of loan application outcomes.

The 95% confidence limits for having hard information versus not having any hard information from Table 10 are -4.6 to 1.6. The resultant Odds ratio estimates for loan success when the hard information is present versus being absent from Table 11 and Figure 3 is 0.28 and corresponding 95% confidence limits are 0.01 to 4.7.

Inclusion of 0 in the 95% confidence interval of the parameter estimate and even odds in the 95% confidence interval of the Odds ratio emphasises how poorly the presence of hard information predicts the outcome of loan applications.

Based on the data collected in the study, not enough evidence exists to support Hypothesis 3 which states

"*When small firms present hard information to banks, their loan applications are more likely to succeed.*"

4.6 Results pertaining to Collateral or Third-party guarantees

The p-value of *Collt* (0.0042) in Table 9 was less than 0.05, thus the presence or absence of collateral or third-party guarantees when small business owners submitted loan applications had an impact on the outcome of the loan application. The Maximum Likelihood Estimate for having collateral or third-party guarantees versus not having them is 2.5.

Table 10 gives the 95% confidence limits for the *Collt* estimate as between 0.92 and 4.5. This range is positive (excludes the value zero) which implies having collateral or third-party guarantees improves the chances of the loan application's success versus not having collateral or third-party guarantees.

The same can be inferred from the odds ratio and its 95% confidence interval which shows the presence of collateral or third-party guarantees are associated with a 13 times better chance of loan application success than not having collateral or third-party guarantees (Table 11 and Figure 3). The 95% confidence interval for Odds ratio of having Collateral or third-party guarantees ranges between 2.5 and 89. This range excludes even Odds ratio of 1, emphasising that the presence of collateral or third-party guarantees improves the chances of loan application success.

The data collected in the study supports Hypothesis 4 that

"*Small firms' loan applications are likely to succeed in the presence of adequate collateral or third-party guarantees alone.*"

4.7 Summary of the results

The chapter presented the results of the study as they related to the hypotheses summarised in Section 2.5. A credit score above 685 was found to have a significant positive impact on the outcome of a loan application when compared to a credit score below 685. Similarly, when small businesses possessed collateral or third-party guarantees, they significantly improved their chances of loan application success when compared to small businesses who did not present either.

On the other hand, small businesses that had hard information like tax records, business plans or financial records did not see any significant difference in the outcome of their loan applications compared to small businesses that did not have this hard information. Likewise, small businesses that had relationships with the banks from which the loans were sought, did not get any significant benefit from these relationships compared to small businesses that sought loans from banks with which they had no prior relationships.

CHAPTER 5. DISCUSSION OF THE RESULTS

5.1 Introduction

This chapter discusses the results of the study pertaining to the credit score of applicants in Section 5.3. Section 5.4 discusses the relevance of the presence or absence of relationships between the bank from which the loan was sought and the small businesses applying for the loan on the outcome of the loan application. In Section 5.5, the discussion considers the effect availability of hard information had on the outcomes of the small businesses' loan applications and Section 5.6 the effect of borrowers presenting collateral or third-party guarantees with their loan applications is discussed. The chapter concludes in Section 5.7 with a summary of the major findings of the study.

5.2 Discussion pertaining to the Logistic Regression model

Because the logistic regression model converged, as per Table 5 the SAS model outputs presented above are valid.

The AIC (Akaike information criterion) rewards goodness of fit and penalises when the number of estimated parameters increases (unlike -2Log L), to reduce overfitting (Akaike, 1974). The Schwarz criterion (SC) is only valid when sample size is much larger than the number of estimated parameters in the model (Giraud, 2014). Both AIC and SC help minimise overfitting by penalising for too many free parameters.

In the Model Fit Statistics in Table 6 all three criteria show that the intercept and covariates method better fits the data than the intercept only method because the fit statistics are lower (Allison, 2012).

From literature, there are no interaction effects expected on the explanatory variables and confirmed by the estimated correlations of the independent variables in Table 7 being less than 0.7 (Lee, 2015). This confirms the absence of extraneous variability. Furthermore, given the small size of the sample, introducing interactions would have

increased the number of free parameters in the model, resulting in worse model fit statistics than those obtained in Table 6. For this reason, the simple linear logit model is considered.

For Logistic regression, the "goodness of fit" is tested using the Wald chi-square (χ^2), Likelihood ratio χ^2 statistics (Eyduran, 2008) and Score χ^2 statistics (Agresti, 2002). For a good fit, the p-values (Pr> χ^2) in all three tests (i) Likelihood Ratio test (ii) Score test and (iii) Wald test in Table 8 must be less than 0.05. Allison (2012) cautions against the temptation to use larger p-values to reject the null hypothesis because of small sample sizes, instead encourages smaller p-values when sample sizes are small. A Likelihood ratio test is based on the likelihood function evaluated at two points, whereas the Score Test is the less common of these tests and the Wald test is based on the parameter estimates and their covariances (e.g., standard errors) derived mostly using maximum likelihood or least squares. Wald tests and likelihood ratio tests typically yield very similar results, especially as the sample size increases.

All three tests gave p-values less than 0.05 and the four degrees of freedom (DF) correspond to the four coefficients of the explanatory variables (Allison, 2012). The Global null hypothesis stating that all the slope parameters for all the independent variables are equal to zero is thus rejected. This means at least one of the tested independent variables' slope parameters, is not zero.

However, Likelihood Ratio test is the most versatile of these tests and at small to medium sample sizes, it is more reliable than the Wald test (Agresti, 2002; Allison, 2012); for this reason, the Likelihood ratio is used to calculate the estimates and confidence levels of parameter estimates.

The p-value for the estimate of the intercept was -0.25 (more than 0.05) with the corresponding 95% confidence level interval being -3.4 to 3.5, which includes the value 0. Therefore, the intercept is not significant in the model for predicting loan application outcome.

The Odds Ratio estimates corresponding to the above parameter estimates were obtained by raising Euler's number (e) to the power of the estimate (β). i.e.

$$OddsRatio = e^{\beta}$$ **Equation 4**

Similarly, the 95% confidence intervals for the Odds ratios were obtained by raising *e* to the power of the upper and lower 95% confidence intervals of the parameter estimates.

5.2.1 *Influence Diagnostics*

The Predicted probability diagnostics in Figure 5 and the Influence on the Model Fit and Parameter Estimates in Figure 6 single out a few observations as having high chi-square deletion difference and deviance deletion difference.

Influence diagnostics in Figure 7 clarify the observations as 4, 8, and 11 that are not fitting the derived logistic model well (SAS Institute Inc, 2008).

In all three observations, the Loan applications were not successful whereas the predicted probability for Loan application outcome was greater than 0.8. Since the observations were associated with the presence of both collateral or third-party guarantees and Credit Score above 685, it is could be that though the borrowers presented collateral or third-party guarantees, their quality might not have met the banks' requirements. Good quality collateral must have stable value that exceeds the loan amount over the loan term, its useful life must be longer than the loan term and it must be easily disposable should the need arise. Good quality third-party guarantees, on the other hand, must be creditworthy themselves and have the means to meet the loan obligations should the need arise.

Notably observation 4 in the results does not fit how the impact of collateral is explained by the model as well as the rest of the data. This could have been due to the quality of the collateral presented or the value of the collateral presented not matching the banks valuation.

Similarly, observations 4, 7 and 35 do not fit the model explanation of the impact of having a credit score below (or above) 685.

There seems to be no notable instabilities in the model due to the impact of relationship or hard information because relationship and hard information have no significant impact on the outcome of loan applications, according to the model.

The area under the ROC curve in Figure 4 (also called the c-statistic) measures discrimination, in other words, the ability of the model to correctly classify loan applications as approved or declined. Despite the outliers above, the area (0.878), shows excellent discrimination, according to Hosmer and Stanley (2000).

The Estimated Correlation matrix in Table 7 lists all the correlation parameters for each of the tested explanatory variables in the model, and they were all found to be less than 0.5, implying there is no multicollinearity between any of the variables (Lee, 2015; Tabachnick & Fidell, 2012).

5.3 Discussion pertaining to Credit Score

The findings of the study are consistent with those of Cassar et al. (2015) who also found that higher third-party credit scores are associated with lower chances of loan denial. South Africa's credit information systems are well developed and regulated; as such, banks rely on them to distinguish good borrowers from bad ones (Sufian & Kamarudin, 2016).

This could explain why credit scores' impact would be greater than that associated with soft information (Relationships). However, one weakness is because small businesses are mainly active in the informal sector, their credit positive behaviour goes unrecorded at the credit bureaux, whereas their credit negative behaviours are almost always reported. The implication is that small businesses are depicted as worse creditworthy clients than they actually are.

Small businesses are encouraged to formalise all their transactions to give a more accurate reflection of their actual credit rating.

The literature review highlighted that credit score addresses asymmetries about capacity, and character because it has input from previous credit repayment history, which would reflect on the capacity and willingness of the borrower to service their

debts. A good credit score alone demonstrates to the lenders that the borrower has a record of honouring his debts, thus addressing information asymmetry on the willingness of the borrower to repay the loan. Financially distressed borrowers would have a bad credit score which would also imply that borrowers with good credit scores are not financially distressed and thus likely to repay the loan.

Thus credit score alone can be used to demonstrate willingness and ability to service debt obligations, as such, as the study also highlights, a good credit score alone is adequate to get a loan approved for small business owners, even in the absence of collateral or third-party guarantees, relationships with the banks or hard information (Figure 8).

5.4 Discussion pertaining to Relationships

Relationships between the “big four” banks and the borrowers are not important in determining the possible outcome of loan applications. Though the study does not delve into explaining this finding, literature suggests it could be because the big four banks in South Africa have centralised structures. This nullifies the effect of relationships clients may have with the branches because the loan application decision makers are often centralised and though clients may have relationships with the banks, these relationships are often with the branches with which they interact who are removed from the loan outcome decision makers.

This is consistent with the findings of Canales and Nanda (2012) and Grunert and Norden (2012) who found that centralised banks place less importance on the presence of relationships. Though the study does not distinguish in the South Africa context, if decentralised banks place more importance on relationships than these “big four” banks which are centralised, it is however, consistent in that the “big four” banks are centralised and relationships are not significant in their loan granting behaviour to small firms.

Relationships that individual customers would have with their local branch are not expected to have any significant impact on the outcome of loan applications as decision makers are often based at head office. Relationships should reveal

information about the capacity of the borrower to service the debts to the centralised decision makers but their character is only apparent to the branches with which they interact.

Cotugno et al. (2013) and Kiisel (2013), though, suggest longer (deeper) relationships might be a better predictor of loan applications than just the presence of relationships. Similarly, Cotugno et al. (2013) and Ferretti (2016) found exclusivity of relationships with banks leads to less credit rationing due to reduced adverse selection.

5.5 Discussion pertaining to Hard Information

The study reveals that the presence or absence of hard information by itself is not significant in predicting the outcome of loan applications for small businesses in South Africa. The presence of hard information by itself is prone to the following weaknesses;

- the hard information considered in the study, though providing information about the financial affairs of the business, is mostly historical with the exception of Business Plans. It provides information about past performance which is no guarantee of future performance.
- the banks might not trust the quality of the financial records provided because small firms are not bound by any accounting reporting standards.
- tax records might also be understated to avoid paying taxes.
- business plans have various formats and the presented plans might not meet the financial institution's requirements (Chimucheka, 2012).

Fatoki and Odeyemi (2010) suggest that business plans and Agostino et al. (2008) and Beck and Cull (2013) found hard information in general, to be linked to better chances of loan application success for small businesses. The study however, finds otherwise, the presence of any audited or unaudited financial statements, tax records or business plans does not lead to any improvement in a loan application's success for small businesses in South Africa. This finding is consistent with the findings of

Cassar et al. (2015) i.e. financial records in any format do not increase the chances of a loan application's success.

5.6 Discussion pertaining to Collateral and Third-party Guarantees

Given the well-developed legal systems in South Africa (Sufian & Kamarudin, 2016), the results of the study support the expectation that the "big four" banks will place a lot of importance on the collateral or third-party guarantees when deciding on loan applications. Banks need an alternative way of getting their funds back, should the borrowers fail to return the money they borrowed, as such, they rely on favourable legal systems.

This was consistent with the findings of Fatoki and Van Aardt Smit (2011) for commercial banks in South Africa.

Collateral and third-party guarantees almost always ensure that the banks do not lose any of the borrowed funds, regardless of any of the other four C's of credit (capacity, capital, conditions and character). In a way, it also reduces information asymmetries (Kirschenmann, 2016; Menkhoff et al., 2012; Minnis & Sutherland, 2016) about the borrower's character because they pledge assets they tend to lose if they do not repay the loan. Alternatively, if they have provided third-party guarantees, these third-party guarantors are actually promising to meet the borrower's obligation to the bank in case the borrower cannot, reducing information asymmetry.

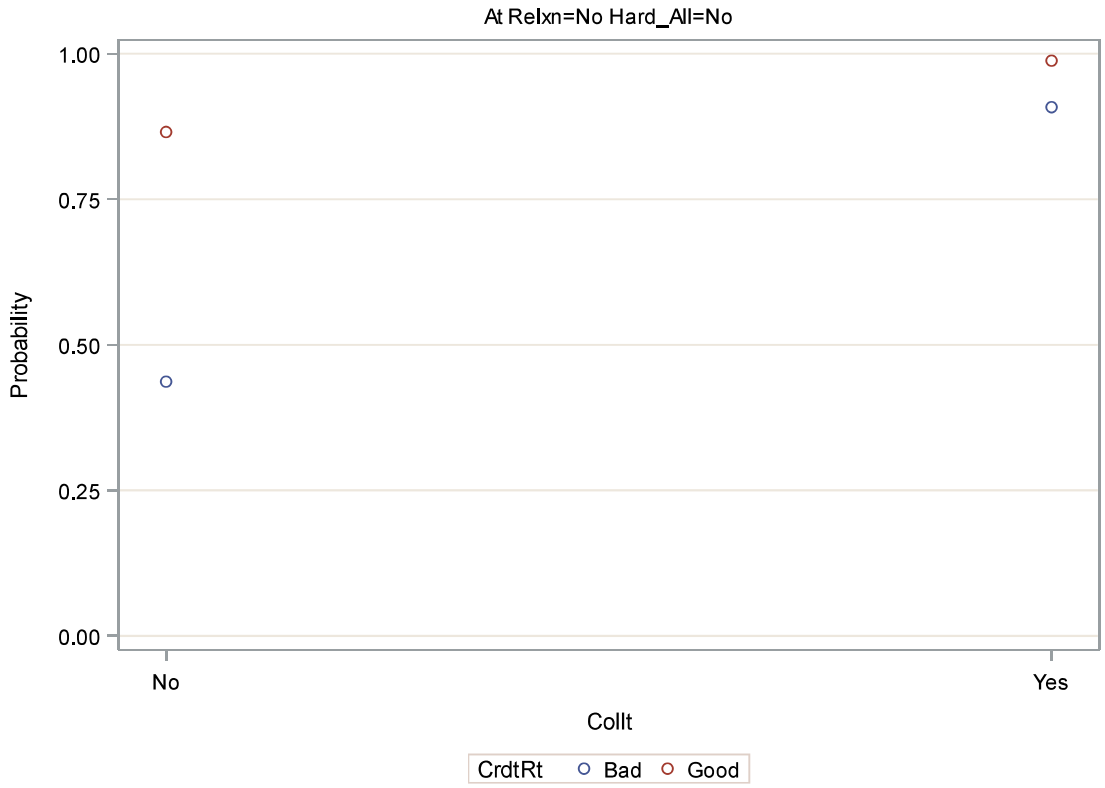


Figure 8 Predicted probabilities of Loan application success

Furthermore the above plot (Figure 8) demonstrates that a critical credit score of 685 or presence of collateral or third-party guarantees alone were significant factors to the success of loan applications, whilst having both led to almost certain loan application success.

5.7 Conclusion

A good credit score or presence of collateral or third party guarantees are critical for small businesses in South Africa to be able to access credit from the big four banks, the presence of both will almost certainly lead to a successful credit application.

However, Nemes et al. (2009) caution that maximum likelihood estimates and Odds ratios tend to be overestimated for smaller samples. Thus, though the relationships exist for credit scores exceeding 685 or presence of collateral or third-party guarantees, the magnitude of their impacts to the outcome of loan applications

obtained in the study may be inflated due to the small sample size that was used in the study.

The study found relationships are not important in determining the outcome of loan applications and this could be related to the big four banks having centralised credit departments that are isolated from any relationships with the applicants.

Small businesses do not have to confirm to any accounting or reporting standards, thus banks cannot establish how accurate their financial records are. Similarly, small businesses often do not submit accurate tax returns to avoid paying taxes. Their business plans are often speculative and usually demonstrate unrealistic forecasts which gives the lenders the impression of businesses that do not have the competency to survive in competitive environments, thus will not be able to repay the loans if advanced. Relationships and hard information in the form of audited and unaudited financial statements, tax records and business plans have no impact on the outcome of loan applications when small businesses apply for funding from the “big four” banks in South Africa.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter summarises the findings from the study in Section 6.2. Section 6.3 gives conclusions of the study and Section 6.5 makes recommendations to the stakeholders identified in Section 1.4. Finally, the study concludes with suggestions for further research in Section 6.5.

6.2 Summary of findings

The small business characteristics identified from literature as likely having a significant impact on the success of their loan applications at the major banks are their credit score, existence of relationships with the banks, whether they presented any hard information and availability of collateral or third party guarantees.

Relationships and hard information have been demonstrated to have no impact on the outcome of loan applications, presence or absence of collateral or third-party guarantees and credit score above or below a critical value (685) have a significant impact according to the study.

6.3 Conclusions

The “big four” banks in South Africa prefer to loan to small businesses with either a good credit rating or have provided acceptable collateral or third-party guarantees, the presence of both will almost certainly lead to successful loan applications. On the other hand, the absence of collateral or third-party guarantees and a bad credit rating results in unsuccessful loan applications. Information asymmetries that exist with small business owners mean banks would rather rely on good credit scores that indicate a history of creditworthiness or collateralised loans that give the banks a means of recouping their funds in the event of borrower distress.

Hard information like tax records, business plans or financial records did not have any significant impact on the outcome of small business loan applications at these big four South African banks. Their quality and validity might be questionable hence the banks disregard them even when they are presented in making decisions on loan application outcomes for small businesses.

Relationships have no impact on the outcome of loan applications as well probably because of the centralised structures of these banks where loan decision making teams rarely have ongoing interaction with loan applicants.

6.4 Recommendations

It would be recommended for small business owners, where they can, to provide some form of collateral or have third-party guarantees who have the means to act as surety on the loans. These third-party guarantees often provide support that goes beyond surety as they would rather avoid having to be called upon and thus have a vested interest in the success of the business for which they provided surety.

Formalisation of all transactions is encouraged as often small business owners operate informally and when they honour their financial obligations, this information is never recorded. Instead, it is when they struggle, for example when judgements are passed against them, or when they are blacklisted that their financial records are formalised. As such, when credit checks are done, it is mostly the information that harms their credit score is that which is found and consequently they are denied credit.

6.5 Suggestions for further research

It is suggested further study should be carried out to confirm the findings of the study with a larger sample, as well as possibly including measures like depth and exclusivity of relationships, some measure of quality of hard information and collateral. A larger sample would give results validity when these additional explanatory variables are included in the analysis. In addition, the sample would be more representative of the South African small business landscape providing large

number of observations to be sampled and still have some observations to use for confirming the findings which would improve the external validity of the results.

If information could be sourced from the big banks on their credit granting behaviour when dealing with small businesses, it would also be valuable to carry out the research from the perspective of the lenders, considering an aggregate of the banks as opposed to comparing them or analysing each bank individually.

Similar research could be done for small businesses seeking funding from alternative funding sources like smaller banks, crowd funding, venture capitalists, alternative business funders and government loans. This could highlight the type of funders who are better suited to provide small businesses with funding. Though these alternative funding sources control a much smaller portion of the lending market, they might still have adequate liquidity to provide funding for small businesses.

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APPENDIX A

Actual Research Instrument

Dear Participant

Thank you for taking time to participate in my research by answering this questionnaire. Please answer all questions in full to facilitate meaningful analysis of the results. All questions relate to a loan application the respondent made in the last 3 years to any of the big four banks (ABSA, FNB, Nedbank or Standard Bank) in South Africa. All information you provide is meticulously treated to maintain confidentiality and anonymity of the respondents. Neither you nor your company will be identified by name in my report. To this end therefore, no individual names, phone number, e-mail address or other particulars that might identify you individually are required when completing this questionnaire. All the information provided will be treated in strict confidentiality. The questionnaire should take you not more than 20 minutes to complete.

Should you have any queries please contact

(i) the Researcher on 1289071@students.wits.ac.za or

(ii) (ii) the Research Supervisor on derekseely@gmail.com

Thank you,

Q1 Is your business based in South Africa?

- ○ Yes (1)
- ○ No (2)

Q2 Has the business applied for credit / loan from any of the big four South African banks (ABSA, FNB, Nedbank or Standard Bank) within the last 3 years?

- ○ ABSA (1)
- ○ FNB (2)
- ○ Nedbank (3)
- ○ Standard Bank (4)
- ○ Other Bank (5)
- ○ Other Credit Provider (6)
- ○ Not applied for credit (7)

Q3 What was the approximate annual turnover / sales for your business prior to the loan application?

- ○ Less than R500,000 (1)
- ○ Between R500,000 and R1,000,000 (2)
- ○ Between R1,000,000 and R2,000,000 (3)
- ○ Between R2,000,000 and R5,000,000 (4)
- ○ More than R5,000,000 (5)

Q4 How much money (in Rands) did the business apply for?

Q5 How many full-time employees did the business employ prior to the loan application?

- ○ Less than 5 (1)
- ○ Between 5 and 20 (2)
- ○ Between 21 and 99 (3)
- ○ Between 100 and 499 (4)
- ○ More than 500 (5)

Q6 How many credit cards did the owner of the business and the business have at the time of the loan application?

Q7 How many years ago did the owner or business first get a credit card?

Q8 How many years ago did the owner or business first get a loan? (auto loan, mortgage, student loan, etc)

Q9 How many loans or credit cards had the owner or business applied for in the last year before the loan application in question was made?

Q10 How many months prior to the credit application had the owner or business last opened a new credit card or loan account?

Q11 How many of the business or owner's credit cards or loans had a balance on them at the time of the application?

Q12 At the time of the application how much (in Rands) was outstanding on all loans (excluding mortgages) and credit cards?

Q13 How many months prior to the loan application had the business or owner last miss any payment of an outstanding credit?

Q14 How many of business or owner's credit cards or loans were past due at the time of the loan application?

Q15 What was your total credit card limits (in Rands) on all credit cards for owner and business at the time of the loan application?

Q16 What was your total credit card balances (in Rands) on all credit cards for owner and business at the time of the loan application?

Q17 In the 10 years prior to the loan application had the business or owner ever had any negative events listed on their credit report? (Examples of negative events are Bankruptcy, Foreclosure, Repossession of property, Tax lien, Collection agency referral, Other negative report)

- ○ Yes (1)
- ○ No (2)

Q18 Did the business have any prior banking relationship with the bank from which the loan was sought?

- ○ Yes (1)
- ○ No (2)

Display This Question:
If Did the business have any prior banking relationship with the bank from which the loan was sought? Yes Is Selected

Q19 If answer to the previous question was "Yes", for how many months before the application had this relationship existed?

Q20 Did the business have any prior banking relationship with any other bank in South Africa?

- ○ Yes (1)
- ○ No (2)

Display This Question:
If Did the business have any prior banking relationship with any other bank in South Africa? Yes Is Selected

Q21 If answer to the previous question was "Yes", for how many months before the application had this relationship existed?

Q22 Did the business have any accounting information, business plan or tax records when the application for the loan was made?

- [ ] Financial Statements (1)
- [ ] Audited Financial Statements (2)
- [ ] Business Plan (3)
- [ ] Tax Records (4)
- [ ] Other (5)

Q23 How many years had the business been involved in this line of business?

Q24 Did the business present any collateral or third party guarantee when it applied for the loan?

- ○ Yes (1)
- ○ No (2)

Q25 What was the approximate value in Rands of the collateral presented?

Q26 Was the loan application successful or not?

- ○ Yes (1)
- ○ No (2)