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The Impacts of Credit on Small Business Financing in Florida

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This is to certify that the doctoral dissertation by

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Walden University
2017

Abstract

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by

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EDS, Nova Southeastern University, 2003

MSc, Alabama A & M University, 1990

BSc, Alabama A & M University, 1986

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy in Management

with Specialization in Finance

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Abstract

In the United States, small businesses represent 99.7% of firms that provide employment and account for over 50% of all private sector employment. Nevertheless, the rationing of small business borrowing is an indicative of acute credit constraints emanating from poverty, lack of collateral, lack of cosigners for bank loans, high administrative fees associated with processing credit loans, and information asymmetry along with other socioeconomic factors. In a 4-year study from 2004–2008, it was determined that small businesses suffer tremendously from credit rationing. The purpose of this study was to determine the induced effect of loan guarantee scheme, collateral, and leverage on credit rationing. The seminal work of Stiglitz and Weiss served as a framework for the study. The research questions were developed to inquire the relationship (influence) of loan guarantee scheme on credit rationing while controlling for collateral and leverage. Data on small businesses were collected from the Small Business Administration and the National Survey of Small Business Finances websites. Collected data (n = 1,072) of small business firms in Florida for 2015 were analyzed through applying multiple regression methodology. The study results indicated that small business participation in loan guarantee scheme had a significant influence on credit rationing when the confounding effects of collateral and leverage were statistically controlled. The findings of this research could lead to positive social change by providing small businesses with loan guarantee scheme, a government subsidy that eliminates the need for credit rationing.

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Dedication

I give thanks to God for His unfailing love in my life and His faithfulness in perfecting every work He begins in me. This study is for the special loving memory of my parents, especially my mother, Bridget Amede Enebeli, who single-handedly supported my education from kindergarten till her passing to eternity. I thank God for her. Nevertheless, I dedicate this study exclusively to my wife, the love of my life, Betty Chie Chukwuma, and to our four children—Kenechi, Chioma, Chekube, and Chudy—whom I love so dearly, and this is for you.

I am forever grateful to the countless other names in my family and friends' circle whose fervent prayers blessed me in their lifting me up to the Lord. I pray for the Lord's blessing upon them.

Finally, this study is a testament to all that dream big, work tirelessly, and put their trust in God's unfailing love, kindness, and mercy, for in due season you will reap the harvest of your labor.

Acknowledgments

This part of the study could not have been written perfectly without the Lord's unfailing love in perfecting the works He begins in my life. With a joyful heart, I bless the name of our Lord, Jesus Christ. In continuation, my profound appreciation goes to my professor and the committee chair of the program, Dr. Mohammad Sharifzadeh, whose unmatched support, surpassed guidance, and professional know-how have no rival. From the bottom of my heart, I thank you for all you have done to speed and perfect my study.

Furthermore, my thanks go to my professor, the second committee member, and the methodologist for my research, Dr. Bharat Thakkar, whose challenged criticism kept me in line, and may God be the glory.

Finally, my unspoken appreciation and vote of thanks go to the Walden University research reviewer, Dr. Javier Fadul, who's painstaking and unmatched skill singlehandedly read and approved this study, and I thank you.

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Chapter 1: Introduction to the Study

In the United States, small businesses have been the dominant force in job creation and employment for the economy. The Small Business Administration (SBA) reported that small firms, otherwise known as small businesses, represented 99.7% of all employer firms and employed 50% of all private sector employment (Yallapragada & Bhuiyan, 2011). Small businesses also provided employment for more than 45% of the total U.S. private employment and generated 20–50% of net new jobs annually over the last decade (Frid, Wyman, & Coffey, 2016). In a four-year study extending from 2004–2008, it was indicated that small businesses suffered acutely from credit constraint (Mach & Wolken, 2011). Among the various contributions of small businesses were the crafting of new ideas in the existing markets, the making of critical decisions regarding business locations, and the utilization of markets and institutional resources (Cole & Sokolyk, 2016; Singh & Singhal, 2015). Furthermore, the success of the combined role of small and microenterprises (SMMEs) helped to stimulate economic growth and alleviate poverty in the United States (Servon, Visser, & Fairlie, 2010).

However, the struggle of small businesses in obtaining the credits needed to access loans interferes with their functions, growth, and survivability (Samujh, Twiname, & Reuteman, 2012). Small business credits and loans are handled by banks and other lending institutions; however, these financial institutions may have improperly gathered information via secondhand financial data on their small business clients. There is a tense relationship between firms and banks because of the opacity in information gathering, which leads to credit rationing (CR) among small businesses. Microfinance institutions

(MFIs) also suffer from loan approval as a result of improper information gathering (Garmaise & Natividad, 2010).

Nevertheless, the studies on small business credit have become more widespread in underscoring the small business credit struggle. Accordingly, the groundbreaking theory of Stiglitz and Weiss (1985) on CR and the espousing theory of Kraus (2013) made it known that CR costs more for high-risk loan applicants than for low-risk ones. Both studies concluded that CR works well as a screening device that makes low-risk applicants better off with an imposition of opportunity costs on low-risk applicants with respect to obtaining loans. However, credible information gathering on small business credit is difficult and proves to be an impediment in the struggle small businesses encounter (Garmaise & Natividad, 2010).

The supply of loans by lenders involved costs which directly vary with the volume of loan transactions. Figure 1 shows the graph of the interaction between the demand and the supply of loans along with their varying interest rates in a financial market system. The graph labeled various equilibrium points where the supply of loans equals the demand for the loans and vice versa. In the graph, the vertical axis indicated the various interest rates (r) offered to loan applicants, and the horizontal axis (Q) indicated the volume of loans offered correspondingly for the loan applicants.

The marginal costs, or the interest rate for disbursing loans, exhibited an upward sloping function. The marginal cost function described that as the volume of funds supplied from lenders to borrowers' increases, the cost spent on raw materials used in the disbursement process increases in the direction of total output. No doubt, lenders need to

protect their investments by charging an interest rate to cover the marginal cost of disbursed loans. On the other hand, borrower's utility reflects the economic benefits obtained—an increase in production and consumption of goods and services.

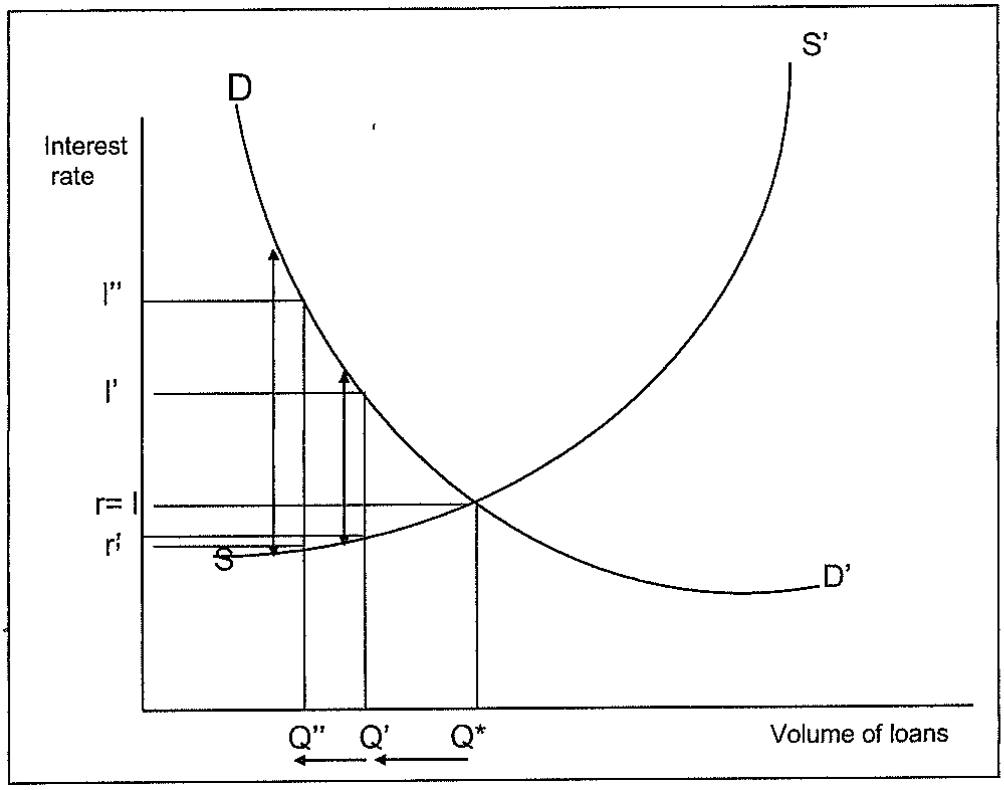

Figure 1. Credit market equilibrium. Adapted from "Impact of Lending Relationships on Transaction Costs Incurred by Financial Intermediaries: Case Study in Central Ohio," (Nalukenge, I. K., 2003).

Figure 1, on p.2 represents the interaction between demand and supply of loans in a debt market equilibrium. In the graph, the vertical side indicated the various interest rates (r) offered for each loan applicant, and the horizontal side (Q) indicated the volume of loans offered for each corresponding interest rate, with the equilibrium at r =1.

Information asymmetry affects small business borrowing (SBB) with respect to CR (Brown, Ongena, & Yesin, 2012). Improper information gathering in financial

markets, especially in a credit market where there is a severe risk of loan default, greatly affects small businesses (Brent & Addo, 2012). Asymmetrically distributed information between agents and the theoretical beneficiaries of financial markets, or the principal decision-makers' reward function, could be interrupted (Canales & Nanda, 2012). Nevertheless, the study should contribute to positive social change by creating awareness on the importance of loan guarantee scheme (LGS) in SBB.

Background of SBB

Small business owners everywhere have their fair share of struggles in their attempts to acquire adequate credit, and many beginning entrepreneurs were crippled in their early formation because of poor credit (Mazure, 2011).

With soft information threatening SBB, Canales and Nanda (2012) posited to "examine the interaction between bank size and market structure, focusing on banks' ability to engage in relationship lending along with their ability to use soft information to their advantage, made a difficult situation worse" (p. 354). Again, some of the soft information on small businesses could be beneficial in helping to determine the small business actual propensity to pay back loans. Information gathering in the 21st century and the challenges of the various risk levels have altered the traditional ways of processing loans between buyers and sellers of financial obligations with respect to credit (Brent & Addo, 2012; Quijano, 2013). Information asymmetry between outsiders (the investors), who provide capital, and insiders (the managers), who control the use of funds, has led to the developments on the theory of how firms acquired and deployed

capital for business expansion, and its effects on small business credit (Crawford, Pavanini, & Schivardi, 2013).

Accordingly, the SBA (2006) guaranteed that lending to minority-owned small businesses has a greater economic impact on market performance. Robb and Robinson (2014) claimed that in a market with a higher per capita percentage, minority-owned small businesses are more likely to experience problems stemming from information asymmetry. SBA guaranteed loans could improve CR and lead to financial market improvement. Nevertheless, an improvement in the local financial market positively affects the economy at large.

The past 10–20 years have experienced an increase in bank loans, which is the prime source of business finance for small- and medium-size enterprises (SMEs) with respect to ex-ante assessments of banks. However, the riskiness of loan applicants and the decision to grant (or not) SMEs loans at a risk-adjusted interest rate seem to take center stage (Berger, Frame, & Ioannidou, 2011; Schwartz-Garliste, 2013). According to Robb and Robinson (2014), firms have relied heavily on formal debt financing in the areas of owner's bank loans, business bank loans, and business credit lines. Nevertheless, loans to households and SMEs, with sensitivity to systematic risk, are treated unfavorably and required to pledge more collateral. This is supported by the findings of Jianchun and Daly (2012), who stated that there are considerable differences between borrowers with respect to their collateral requirements. Banks also could influence SBB via long-lasting relationships (Gambini & Zazzaro, 2013; Rosenfeld, 2014).

The study justified its importance on how small businesses suffer tremendously from improper information gathering because of their inherent poor financial footings before their lenders. They experience undue process fee charges and suffer immensely from CR because they lack the necessary collateral to gain better credit approval. Small businesses emanate from deprived backgrounds marginalized by poverty and with no credit history. Because small businesses lack access to mainstream banks—and consequently lack the proper financial access—and lack prior credit history for commercial banks, small business loan approval is based on improper information gathering. Though empirical evidence on the perception of entrepreneurs suggested that access to finance may be harder for SMEs, factors such as controlling for SME characteristics, firm growth, credit scores, and selection effects have downplayed that small businesses are deprived in accessing finance (Lee & Drever, 2014).

Though SMEs experience credit problems when borrowing from commercial banks, access to finance in deprived areas has its geographical consequences by creating a financial gap in SBB (Appleyard, 2013; Mason & Pierrakis, 2013). Therefore, a finance gap is likely to exist, and firms suffer as a result of geographic deprivation. Nevertheless, only a limited number of studies considered access to finance in deprived areas a major factor in SMEs borrowing (Lee & Crowling, 2013).

Presentation of the Study

The limiting factor of credit has been a major issue for SMEs. Small businesses need the capital to finance their business undertakings. Because banks deem SMEs as risky, they face the chances of loan denial (Department for Business, Innovation, and

Skills, 2012; Lee & Drever, 2014). From the onset, the banking regulatory system has placed emphasis on the firm's proportion of its collateral when accessing loans. In hindsight, a firm's proportion of collateralized loans is positively related to its level of credit risk and asymmetric information (Jianchun & Daly, 2012). Nevertheless, small business owners have continued to loan default at such an increasing rate in the past 30 years that it becomes more difficult for SMEs to obtain loans from commercial banks.

It is equally important to further discuss the borrowing cost of loans to SMEs. The ex-ante default risk of the borrowing firm should affect the firm's borrowing cost because of adverse selection, hence forcing financial institutions to ration credit rather than vary their lending rates (Wu & Chua, 2012).

Problem Statement

The 2003 Survey of Small Business Finance (SSBF) explored the ways credit is used in the United States, and the consequent effect of credit constraints faced by more than 4,000 U.S. small businesses where small businesses experienced a downward spiral in their credit acquisition (NFIB, 2010). In the four-year study from 2004–2008, the problem of credit with small businesses grew to a point whereby their survivability was threatened (Mach & Wolken, 2011). Small business owners suffer a common problem arising from insufficient credit, resulting in higher interest rate payment. Furthermore, many small businesses have no form of credit history, which affects their access to loans (Banerjee & Duflo, 2013; Gupta, Wilson, Gregoriou, & Healy, 2014).

Access to credit has been a strategy used not only in the United States but in many countries of the world. Developing countries used credit access as an instrument to

reduce poverty and encourage debt financing in small business setups (Al-Azzam, Mimourn, & Ali, 2012; Brown et al., 2012; Yallapragada & Bhuiyan, 2011). Information asymmetry in a marketplace occurs when the demand for loans exceeds its supply, or vice versa, undoubtedly leading to credit market disequilibrium and giving rise to credit rationing. Also, the absence of collateral to lessen the burden of loan heightens the creation of lending crises (Cassano, Joeveer, & Svejnar, 2013; Steijvers & Voordeckers, 2009).

Though many scholars have documented the struggle of small businesses with regards to credit, none have discussed LGS as an alternative to CR. LGS is a government program created as a buffer to the credit market imperfection by addressing the financing needs of SMEs through debt capital (Kuo et al., 2011). The fact that most small business owners lack collateral makes it difficult for small businesses to mitigate credit problems (Blazy & Weill, 2013).

Purpose of the Study

The quantitative design method of the study statistically explored if loan guarantee scheme (LGS), collateral (COLL), and leverage (LEV) could alleviated the burden associated with credit rationing (CR) in small business debt financing. The research design used a survey method, along with a survey instrument sent to 200 randomly selected small business owners in the state of Florida for data collection.

The dependent variable, CR, was measured by the amount of loan(s) received by the small business divided by the total credit requested from the bank. The independent variables of the study involve the different components of small business LGS, along

with COLL and LEV. The potential findings of the study were explored using the SBA data set to expand LGS programs, reduce poverty, advance marginalized small business owners, and help to advance positive social change.

Research Questions and Hypotheses

For the study, the following three research questions and hypotheses were investigated:

Research Question 1

RQ_1: Is there any relationship (influence) of LGS on CR?

Null Hypothesis 1

$H0_1$: There is no relationship (influence) of LGS on CR.

Alternative Hypothesis 1

H_1: There is a relationship (influence) of LGS on CR.

Research Question 2

RQ_2: Is there any relationship (influence) of COLL on CR?

Null Hypothesis 2

$H0_2$: There is no relationship (influence) of COLL on CR.

Alternative Hypothesis 2

H_2: There is a relationship (influence) of COLL on CR.

Research Question 3

RQ_3: Is there any relationship (influence) of LEV on CR?

Null Hypothesis 3

$H0_3$: There is no relationship (influence) of LEV on CR.

Alternative Hypothesis 3

H_3: There is a relationship (influence) of LEV on CR.

Summary of Criteria for Hypotheses and Equations

Equations 1–6 took the form of partial derivatives. The relationship between the dependent variable (the numerator) and the independent variable (the denominator) was zero for Equations 1, 3, and 5 and greater than zero for Equations 2, 4, and 6.

Hypothesis 1

$H0_1$ is rejected if the following pattern of partial derivative between CR and LGS holds:

$$\frac{\partial \text{CR}}{\partial \text{LGS}} = 0 \quad (1)$$

Further, H_1 is accepted if the following pattern of partial derivatives between CR and LGS holds:

$$\frac{\partial \text{CR}}{\partial \text{LGS}} > 0 \quad (2)$$

Hypothesis 2

$H0_2$ is rejected if the following pattern of partial derivative exists between CR and COLL:

$$\frac{\partial \text{CR}}{\partial \text{COLL}} = 0 \quad (3)$$

Similarly, H_2 is accepted if the following pattern of partial derivative is found between CR and COLL:

$$\frac{\partial \text{CR}}{\partial \text{COLL}} > 0 \qquad (4)$$

Hypothesis 3

$H0_3$ is rejected if the following pattern of partial derivative exists between CR and LEV:

$$\frac{\partial \text{CR}}{\partial \text{LEV}} = 0 \qquad (5)$$

In the same manner, H_3 is accepted if the following pattern of partial derivative is found between CR and LEV:

$$\frac{\partial \text{CR}}{\partial \text{LEV}} > 0 \qquad (6)$$

Equation 7 presents how the statistical tests were performed on the variables of the study including the error term and sample estimates:

$$\boldsymbol{CR = \beta_0 + \beta_1 LGS + \beta_2 COLL + \beta_3 LEV + \varepsilon} \qquad (7)$$

Discussions of the criteria for retaining or rejecting of either the null or alternative hypotheses for the study are met in Chapter 3.

Theoretical Foundation

My study in SBB reflects a model presented by Stiglitz and Weiss (1981) and Becchetti, Garcia, and Trovato (2011) involving demand and supply loans in a debt market. In the study, Stiglitz and Weiss postulated that market failure to adjust to price changes when demand exceeds supply, or vice versa, causes disequilibrium in the market, and hence CR. Furthermore, Stiglitz and Weiss argued that the reason for loan rationing

is prices could not be adjusted for equilibrium between demand and supply. In addition, a loan market may be characterized by CR because the interest rate banks assess to borrowers and the riskiness of the loan obligations are unfairly targeted to small businesses, and hence disequilibrium in the price of loans.

The model presented by Stiglitz and Weiss (1981) reflected the credit experience small businesses undergo in the United States when they try to obtain loans (Dou et al., 2014; Robb & Robinson, 2014). Nevertheless, the interest rate banks charge small businesses in loan pricing is important. The interest rate payment charged by banks is used to sort out certain kinds of borrowers because only risky borrowers are willing to invest at such a high rate of interest, leading to adverse selection and moral hazard problems (Cassar, Ittner, & Cavalluzzo, 2015). As the interest rate rises, the riskiness to the borrower increases, signaling lower profits for banks. A change in interest rate and other contractual apparatus affects the borrower's likelihood for loans (Stiglitz & Weiss, 1981).

Stiglitz and Weiss (1981) stated that in a loan market, banks make loans and acquire profits based on the loan riskiness and the interest rate such loans attract. The interest rate that a bank charges on the loan may affect the riskiness of the loans, and the interest rate is instrumental in deciding potential borrowers of such loans. In an era of imperfect information gathering, banks may increase their profit margin by charging interest rate accordingly. The existence of information asymmetry has brought about changes in interest rates and other contractual arrangements, leading to disequilibrium between supply and demand in the financial market.

Jianchun and Daly (2012) cited that providing collateral as a tool in a market, characterized by informational asymmetries, is a sign of risky lending, which may solve CR. Furthermore, the study indicated that a firm's proportion of collateral is positively related to its level of risk and asymmetric information. However, there was a lack of competition among small business to increase the interest rate to bring together demand and supply. In a similar model of CR, Berger et al. (2010) articulated that a contractual use of collateral is good for lenders, borrowers, and the society at large. Though lenders incurred costs from screening and monitoring the pledged assets, borrowers, on the other hand, suffered as collateral may impose a form of opportunity costs to them by tying up assets that the borrowers could have otherwise used for further productive processes.

The credit market is unlike the standard market because it deals with the allocation of credit. Credit is defined as the value of money or goods received by an individual or firm in exchange for a promise of repayment in money or goods in the future. The analysis of credit allocation could be complicated when viewed from a standard market perspective. A market for credit is the same as a promise. The interest rate is the underlying factor that differentiates the standard market from the credit market—the interest rate is the price that equates the demand and supply for credit. Poor allocation of credit implies poor investment project, and the firms and the nation end up paying the price. However, the nature of credit markets was most evident in the case of CR where borrowers of financial obligations are denied credit, even though they are willing to pay the market interest rate (Berger et al., 2010; Blazy & Weill, 2013).

Nature of the Study

This study was guided by a quantitative design and used a survey method to collect data for the study. The sample of 93 small business owners was selected randomly from among small businesses in Florida. The dependent variable was CR—measured by the amount of loan received by the small business divided by the total credit requested from the bank. The independent variables are made up of small business LGS, leverage, and collateral. The data collection consisted of sampling 93 small business owners in a ratio of 62 small businessmen to 31 small businesswomen, respectively. Data analysis determined if a correlation existed between LGS and CR. In addition to using the Pearson correlation coefficient, the study's data analysis followed a model used by Stiglitz and Weiss (1981) and data from the SBA conducted by the NSSBF of 1998. In addition, archival data from SBA was implemented to determine the significance of the study. Given the research question and the hypotheses testing, the analysis ascertained if a correlation existed between LGS (independent variable), CR (outcome/dependent variable), and COLL (confounding variable).

Furthermore, using the Pearson correlation coefficient along with the Statistical Package for the Social Sciences (SPSS) achieved statistical significance of success or failure. Though collateral had a mitigating effect on CR, its research-lessening intensity needed controlling to realize the positive impact of LGS. Statistics from the studies of Levenson and Willard (2013) and Regis and Weill (2013) could be used to verify the impact of LGS as an alternative to CR. Additional statistics involved the logit model regression to reach the desired result.

Assumptions

The initial assumption for the study was that an average small business owner is credit constrained because of poverty that threatens their existence. Small business owners obtained the initial startup capital from their friends and families rather than from commercial banks. Furthermore, SMEs are concerned with loan denial especially when they are financing fixed investments (Akin, 2014; Mueller & Reize, 2013). Besides, the wave in economic and political development in most parts of the world and in SMEs increased the importance of the change.

SMEs lack access to public equity market and corporate bond market, hence their chances to external financing is difficult (Mueller & Reize, 2013). At this conjecture, little is known if SMEs, by adjusting their investment volume, can meet the rising demand for loans.

Furthermore, the study discusses assumptions by evaluating the role participants play in research from their answers to questionnaires. The special role the participants played in providing answers to questionnaires is confidential in nature and requires some degree of trust. As well, the characteristics of participants and the information they provided required some form of evaluation (Patton, 2002). However, the outcome of the study could be affected by the character of a participant, which is difficult to determine.

Scope of the Study

This study is a testament to the struggle SMEs undergo in their attempt to obtain credit for the success of their business. Many times, small business owners are denied loans because of inadequate credit, no collateral, and improper information gathering by

commercial banks. Capital structure informs that a firm's first year of operation is difficult for startups and ends up in funding from friends and family. Many startups receive debt finance through a personal balance sheet of the entrepreneur and levered equity claims in their startups (Robb & Robinson, 2012).

The SBA has remained an important source of credit for small business, especially in the wake of economic unrest, at which point the SBA addresses the financial fragility of the U.S. enterprise system and provides needed financial assistance. The SBA is no doubt a medium used by the U.S. government to mitigate the financial and institutional challenges faced by small businesses (Cortes & McKinnis, 2012).

The gap in the study is one of the most important parts of the study: reflecting the role LGS played in CR. Nevertheless, commercial banks used the outcome of CR as a yardstick to determine the nature of credit constraint on small businesses and to guard against the losses arising from information asymmetry (Ata, Korpi, Ugulu, & Sahin, 2015). The loan guarantee (otherwise, collateralized loan) was used to ease access to finance for small business and recognize their pivotal contributions to the community and the economy. Before this time, financial institutions reserved their limitation to grant credit to SMEs on the grounds of the high administrative cost of processing small business loans, inherent asymmetric information associated with small businesses, their high-risk perception nature, and lack of collateral (Kuo, Chen, & Sung, 2011).

Delimitations of the Study

The participants in the study were small business owners in Florida who have experienced credit constraints and whose credit experiences have denied them the chance

to obtain loans. There are no shortcuts to bypass credit constraints but the use of collateral, or the relationship lending with commercial banks, had a mitigating effect that leads to CR. With the issues of credit constraints growing over time in the study, a gap in the literature was explored that led to LGS. LGS is a collateral-free government program for financing small business loans (Kuo, Chen, & Sung, 2011). The gap in the study was another factor that narrowed the research, as small businesses deal with the issue of lack of adequate capital. As indicated, few studies have identified LGS as a substitute to the CR of small businesses. Access to finance was a key factor in small business existence and a strong influence in entrepreneurial survivability (Klapper & Parker, 2011). Since access to finance is difficult to achieve in small businesses, the concept of finance required the evaluation and the functioning of the credit system. Because of lack of credit, commercial banks resorted to CR, which is a constraint in SBB. Credit guarantee scheme (CGS), an outcome of LGS, is the most popularly accepted tool (Gurmessa & Ndinda, 2014; Tunahan & Dizkirici, 2012). With the program in place, small businesses could now qualify for government subsidy. Qualification is based on the ability or proof for providing employment for the people, and social amenities for the society.

On the other front was the issue of delimitation as it relates to small business population size and the geographic selection of participants. The research design streamlined the study of SBB. The factors that narrowed the study of SBB started in the data collection phase.

The pool of participants came from small businesses residing in South, Central, and North Florida. The study focused its data collection and questionnaire gathering on

Florida small business owners, most of whom are marginalized in their income because of poor credit. The population sample for the study was 300. The larger the population sample, the closer it was to a meaningful statistic solution. The ratio of the sample was 200 small businessmen to 100 small businesswomen.

Limitations

It was evident in some cases that the data collection phase could involve some element that could be biased because of the trust aspect of data collection in question. In small business data gathering, the data collection process needed to determine a government subsidy is based on the small business owners' ability to provide employment for the people and social services for the community. Even so, most small business employment is unstable because they lack scrutiny and involve unskilled individuals who get hired and fired at will.

Honesty on the parts of the participants when collecting data for the study was important for the success of the study. Bauguess or falsified answers when completing the questionnaires could hinder the result of the study. Participants should be encouraged to provide answers that are error-free to guide the study.

Time is an interval that needs to be considered in a research setting. In this study, I projected the time to complete my research without creating room for revisions that might occur during the study. Incidentally, the prospectus to my research, which I thought was completed, came back incomplete. This indeed created a setback in the study. It took me two quarters, excluding the initial quarter that I started the prospectus, to have the prospectus approved.

Nevertheless, limitations curb the extensity to which a study can go (Simon & Goes, 2013). Since access to finance lacks in small businesses, the concept of finance requires the evaluation and the functioning of the credit system. Because of lack of credit, commercial banks resorted to CR, which is a constraint in SBB. CGS, an outcome of LGS, is the most popularly accepted tool (Gurmessa & Ndinda, 2014; Tunahan & Dizkirici, 2012).

Significance of the Study

This study of small business credit revealed the under-researched area of loan guarantee scheme (LGS), as well as the issues of credit that undermine the struggle of small businesses. The study addressed the inability of small businesses to obtain loans, serving as a major deterrent in small business survival. Small businesses lacked the necessary collateral in their financing history, and hence impacted their credit mitigation efforts (Berger, Frame, & Loannidou, 2011; Menkhoff, Neuberger, & Rungruxsirivorn, 2011). Small businesses, especially those in the United States, have an option to finance debt through LGS. The U.S. Small Business Administration (SBA) Office of Advocacy addresses the financial needs of small businesses through the auspices of the basic guaranteed loan program. The emergence of LGS as the next best thing to credit rationing signals that small businesses can access debt capital, based on the social and economic opportunity they create as entrepreneurs (Kuo et al., 2011). The benefits created by small businesses through LGS are seen in the employment and social opportunities they create and in the export revenues they generate. The self-financing advantage of LGS through the guarantee fees (premiums) helps to avoid the default risk applicable to debt financing.

The study reaches people that have not been reached before. The gap in the literature is clearly stated as it relates to the professional and scholarly components of the study, and the impact understood as it relates to the extensive nature of the problem statement informed by an in-depth literature review.

Besides the knowledge gained in writing the research, its national and global effect on small businesses and its worthwhile enrichment in my profession has made this study an exceptional one. The significance of the study not only fills the literature gap but further informs those in the professional and the academic sectors of the world.

Filling the Gap in the Study

The study filled the gap in the literature by identifying LGS as a debt financing option for small businesses. The gap nevertheless pointed to LGS as the effective alternative to CR in small businesses borrowing. The guarantee fee (the interest rate premium) is set-loan according to the amount of collateral the borrower placed on the loans, causing the difference between the lending rate for nonguaranteed loans and guaranteed loans (Kuo, Chen, & Sung, 2011). LGS is credited for implicit indirect subsidization and evaluated regarding the economic and social benefits that LGS creates—generation of export revenue and creation of employment opportunity (Kuo et al., 2011).

Initially, the only way for small businesses to access capital was through credit rationing offered by commercial banks. LGS is a packaged government program that involves implicit indirect subsidization, evaluated in terms of the economic and social benefits created by the small businesses in the community they serve. With LGS, small

businesses are now qualified for government subsidies and granted access to debt capital. With LGS, credit constraints have no place in SMEs, and debt financing is no longer a problem. Those qualified for LGS simply submit evidence by providing employment and social services in their employment or in the community which they operate (Kuo, Chen, & Sung, 2012). Although many government programs lacked a clear tone on what the objectives are or a clear-cut definition on how to evaluate the program, LGS has the initial aim of self-financing.

Benefit of the Study to Practitioners

The study added to the scholarly literature of small business financing. Scholars and practitioners alike are informed on a new wave of thinking for small business financing. LGS as a collateral-free financing can replace CR, and access to financing can be limitless for small businesses. In the academic sector, universities can use the outcome of this study for knowledge dissemination by discussing the study and its concept that LGS helps to ease the SMEs financial burden to better the economy at large.

Contribution of the Study to Positive Social Change

The study has the potential to affect positive social change by improving the capital structure on SBB. Access to finance, which was once a barrier in SBB, has now become a practice of a bygone era (Sleutjes, Van Oort, & Schutjens, 2012). Moreover, the CR from commercial banks could become a thing of the past with the increase in awards from government subsidies; small business growth hence becomes boundless. In an economy, employment opportunity grows as well as the social amenities for people, which becomes an outcome of the benefit of this study.

Summary and Transition

The existence of small business has been marred by a myriad of credit problems stemming from poverty, lack of capital, no collateral to mitigate credit problems, and not having the basic accounting records necessary to obtain loans. Poor information gathering and an improper process of information also tend to magnify the issue of credit for small business. Even with many federal and state governmental programs available to lessen the problem of poor credit for small businesses, not much has changed in that direction. The minor purpose of the study was to determine whether CR, as assessed by banks, had a greater effect in deciding the amount of loan(s) a small business is approved for.

The major purpose of the study was to determine if LGS provided a better alternative to small business credit rationing when dealing with debt financing. Though improper information gathering persists, the outcome of this study could be used to help improve the credit problem that threatens the existence of small businesses. An overview of the literature pointed out a gap regarding LGS not covered by any known study, and few studies have streamlined the essential importance of LGS in SMEs borrowing.

Hence, the purpose of this study was to determine if LGS provided an alternative to long-existing CR in the process of debt financing. Chapter 1 presented the introduction, the overview of study, the nature of study, the problem statement, the purpose statement, the research questions and hypothesis, criteria for the hypotheses, the theoretical framing, the methodology, the significance of the study, the variables for the study, the assumptions for small business credit, and the limitations in small business credit. Chapter 2 reviews the literature on small businesses credit lending. Chapter 3

presents the methodology and statistical analyses guiding the study. Chapter 4 describes the study's results and assumptions. Chapter 5 discusses the findings, recommendations, and conclusions of the study.

Chapter 2: Literature Review

Introduction

This literature review discusses credit constraint along with other mitigating factors that limit SBB. Bank credit has been a source of external finance for SMEs and a limiting force in the presence of information asymmetry (Canales & Nanda, 2012; Garmaise & Natividad, 2010). Many small banks cater to small firms using hard information technology, fixed assets lending, and credit scoring to approve bank credit to startups, and to relax geographic expansion through the Interstate and Banking Efficiency Act (McNulty, Murdock, & Richie, 2013; Rice & Strahan, 2010). Credit constraints and improper information gathering have proven to deter the chances of financial opportunity for SMEs and startups.

Poverty remains a global problem and a stumbling block for small businesses' access to finance. The incentive of growth and developing entrepreneurial activities by SMEs are often interrupted as a result of poverty. Small business has been met with a myriad of difficulties and has lost out in different stages of development. Interference by the government has helped stimulate SMEs in the right direction (Kent & Dacin, 2013; Tahir, Mohamad, & Basheer, 2011). Poorer, nascent entrepreneurs are more prone to abandon their business before its formation into a firm status because of liquidity constraint and lack of planning (Mukwasi & Seymour, 2012). In the absence of enterprise resource planning, poverty in small business formation is a recipe for failure, and therefore many small business owners failed because of liquidity constraints.

Information opacity that small businesses suffer from as a result of credit constraint and improper information gathering could be minimized by pledging a collateral-free guarantee through third-party relationship lending. Loan guarantees by the government are an important tool to reduce collateral requirements (Jianchun & Daly, 2012). Though collateral has been accepted in contractual arrangements for its debt-reducing feature, its use is often costly on borrowers. Becchetti and Garcia (2011) spoke of the positive incentive of collateral in "that these incentives contribute to solving problems of hidden action and to reducing the lenders' monitoring costs" (p. 932). Collateral is a remedy usage for CR, but its use is inherently limited because of the cost involved in its usage. Therefore, guarantees are the way to go when one needs to reduce collateral requirements.

Firms obtain the needed capital to expand on new business ventures through private market infusion as well as the injection of government capital under the Troubled Asset Relief Program (TARP). The importance of raising capital is felt more seriously in the wake of financial crises (Elyasiani, Mester, & Pagano, 2014). The issue of raising new equity or capital through a private market or TARP has investors reacting positively, since a firm's equity value increases because of a sufficient selection of banks participating in TARP. Overall, the decision for market capital injections might differ between the different times of stress from financial crises and ordinary times. Similarly, reaction might vary between periods of recession versus time of expansion. Nevertheless, the reaction of investors to a firm's decision of injecting large amounts of equity capital to the financial stream of small business is sensitive to firm characteristics.

Literature Search Strategy

Literature searches were limited to a five-year threshold (2011–2016). The only exception was for the seminal works from key historical theorists whose publications are beyond five years old, and the overly importance of their literature made it necessary for their use. All the relevant literature necessary to explore SBB was gathered. The literature gathering process was important because past decades have chronicled a serious decline in small business credits. Walden University's home library was used to search for articles from 2010–2016 related to my research topic in the business management section. EBSCOhost and Academic Search Premier Databases were used, along with Boolean operators for key terminologies. Articles on the exact topics were also searched using digital object identifiers (DOI).

In the three years of literature search, I came across the seminal works of Stiglitz and Weiss (1981) and Steijvers and Voordeckers (2009), whose conceptual findings are the pivotal pillar on which small business credit and credit rationing concepts are defined upon. Furthermore, the current peer-reviewed literature gave more information on the credit history of small businesses and when it becomes essential in borrowing from commercial banks.

The evolution of small business credit and the practice of borrowing originated from financial economists. Seventy years have passed since Wendt (1947), who examined the issue of availability of credit for small business to see the possibility of making loans available for SBB. The fierce competition between large banks that limit and lower funding costs affects the ability of small banks to attract and maintain their

borrowers. Nevertheless, the issue of a government bailout to protect creditors from large, insolvent banks is seen as a move in the right direction (DeYoung, Kowalik, & Reidhill, 2013). Likewise, the contribution of small banks' lending to startups resulted in a lower failure rate, as their lending targeted small, opaque firms stricken by a "poverty trap" (Kraay & McKenzie, 2014). In comparison to small banks, large banks may have a comparative disadvantage in relationship lending with their customers.

On a historical front, conventional wisdom suggests that small businesses are innovative engines of Schumpeterian growth, have a willingness to take risk, and operate with self-interest and foresight (Yallapragada & Bhuiyan, 2011). Small business lending has been a complex journey because of the existence of tacit or soft information. Due to competition in the resources of small businesses, credit extended to small businesses tends to be rationed (Robinson, Akuetteh, Stone, Westhead, & Wright, 2013). Bank lenders rely less on collateral if they have better information about borrowers (Berger & Black, 2011; Gupta et al., 2014). Nevertheless, informational differences between formal and informal lenders are crucial in developing financial markets and as an insight into a better use of collateral based on soft quantitative information.

There are concerns about the relationship between firms and their lenders, indicating no changing trend in the study of small business. However, industry experts and small business owners suggest that the relationship between small businesses and their lenders never improved. For example, the physical distance between small firms and their lenders has increased and their interaction has become more impersonal, and the approval of credit for financing continues to elude the small business sector (Banerjee &

Duflo, 2014). The growing distance between small businesses and the banks, in the presence of soft information, threatens the chances to improve small business credit and the optimal heterogeneity which it enjoys (Antony, Klarl, & Maußner, 2012). Small firms still look forward to a banking infrastructure that processes borrowing at a distance credit and quality over time (Banerjee & Duflo, 2014). Among the European Union (EU), credit history and the development of credit unions began as innovation and cooperation in small business in Northern Britain over 20 years ago, according to the network-based models of innovation-led economic development (Freel & Harrison, 2006).

With an outstanding record that small businesses represent 99% of employer firms in the United States, the loan process tends to ignore accomplishments of small business simply because of credit. The call report and data from the Community Reinvestment Act (CRA) speak volumes of the discrepancies in the lending practice for small businesses. The call reports measure outstanding loan balances by the location of the lender's headquarters (Williams, 2014). A comparison of the small businesses lending call report and the CRA data report for 2012 and 2013 is shown in Table 1.

Literature Search and Statistics of SBB

According to Amel and Mach (2014), the total outstanding loans to small businesses dropped substantially following the crisis. Incidentally, large loans began to rebound by the third quarter of 2010—large lending finally returned to its previous growth trajectory whereas small loans outstanding continued to decline in most community banks. To address the decline or the perceived lack of supply of credit to small businesses, the Small Business Lending Fund (SBLF) was created as part of the

2010 Small Business Jobs Act, with the SBLF in charge to provide low-cost funding to small businesses through community banks. Nevertheless, the U.S. Department of Treasury provided a report that SBLF participants had increased their small business lending by $12.5 billion over their baseline numbers. Finally, the call report data from community banks and thrift institutions provided a useful tool to evaluate the impact of receiving funds from SBLF on their small business lending.

Nevertheless, the literature search strategy is incomplete without its documentation. The objectives in documenting the literature search strategy are as follows: to reflect lending patterns on the background of the study; to develop a conceptual framework for the study; to find how the study fits previous studies; to judge the quality of findings; and to see if further studies are needed. With that in mind, it was important from the onset to define the topic of the study by consulting databases and indexes.

The search strategy was instrumental in forming the present study as well as reflecting on the past studies. For example, the seminal works of Stiglitz and Weiss (1981) and Steijvers and Voordeckers (2009) have become the conceptual basis for understanding the issue of credit constraints and CR. Overall, the quality of a study's search strategy determines the success of a research study.

Literature Search and Documentation in SBB

Literature gathering is important because the past decades have chronicled a serious decline in small business credit. For the past three years, I used Walden University's Library to search for articles in the business management section related to

the topic. I made use of EBSCOhost, Academic Search Premier, and sometimes referenced Boolean operators for key terminologies. I also searched for articles on the exact topics using DOIs. Nevertheless, in the three years of literature search, I encountered the seminal works of Stiglitz and Weiss (1981) and Steijvers and Voordeckers (2009), whose conceptual findings are the pivotal pillar on which small business credit and credit rationing concepts are defined. Furthermore, I searched the current peer-reviewed literature as I was getting more information on the credit life of small business when it becomes essential in borrowing.

Nevertheless, the literature search strategy is incomplete without its documentation. The objectives in documenting the literature search strategy are to reflect a lending pattern on the background of the study; to develop a conceptual framework for the study; to find how the study fits into previous studies; to guide the determination of the findings; and to see if further studies are needed. With that in mind, it is important from the onset to define the topic of the study, which was done by consulting databases and indexes such as EBSCOhost and Academic Premier.

The search strategy is instrumental in informing the present study as well as reflecting on the past studies. For example, the seminal works of Stiglitz and Weiss (1981) and Steijvers and Voordeckers (2009) have become the conceptual basis for explaining and understanding the issue of credit constraints and CR in SBB. Further findings to substantiate the obstacles younger, smaller firms face in financing, particularly in the nonmanufacturing sector, is severely alarming (Dong & Men, 2014). Nevertheless, the quality of a search strategy in a research study determines its outcome.

Lending Structure in SBB

The U.S. government takes great interest in making loans affordable for small, opaque businesses. Access to credit is essential to small business survival, growth, and recovery, and the banking system in the United States is the supplier of credit for SBB (Williams, 2014). Accordingly, the call report covers federally insured depository lending institutions (saving banks, cooperative banks, savings and loan associations, and commercial banks) except for credit unions and foreign banks. The call report and the CRA report databases are used to evaluate how well lenders are meeting the credit needs of small firms using the following four performance measures:

- Number of loans;
- Aggregate lending;
- Total asset ratio; and
- Total small business loan ratio.

The call report is a helpful medium for identifying individual lenders that are investing in small business. The CRA, on the other hand, is an act of Congress enacted in 1977 with the intention of encouraging depository institutions to help meet the credit needs of the communities. CRA helps to revitalize small business lending and community empowerment at large. Table 1 is a comparison of call report and CRA data for 2013.

Table 1

Comparison of Call Report & CRA Data in the Small Business Lending Study, 2013

	Call report data	CRA data
Data year	2013	2012

Loan information provided	Stock of outstanding business loan balance, quarterly	Loans originated and purchased over the calendar year
How loan location is identified	State in which the lender's headquarters is located	State in which the lender made the loan
Lenders reporting	Reporting lenders: depository lending institutions and bank holding companies	Depository lending institutions and bank holding companies with approximately $1 billion or more in assets

Note. Adapted from "Small Business Lending in the United States 2013," by V. Williams, 2014, p. 10.

To expand on small business lending practices, a review of small business capital borrowing from 2008–2013 is presented for the study. The introduction of the study along with the survey revealed a growing trend in small business debt usage. With respect to small business lending in the United States for 2013, the call report concept, with regards to lending ties, defines a small business loan to be $1 million or less, a micro business loan to be between $100,000 and $1 million, and a large business loan to be greater than $1 million (Di & Hanke, 2012; Williams, 2014). The survey also reported that lenders made efforts to ease lending standards. Despite the attempts to ease lending strategies and improve economic indicators, the pace of borrowing and lending in the small business loan market remains weak (Williams, 2014). Though small businesses significantly contribute to the growth of the economy, they are vulnerable to economic downturns, and the evidence of tax advantage has no impact on small business debt. Rather, tax laws allow businesses to reduce tax liability by deducting interest expenses from taxable income.

Though credit unions are not covered by the report of federally insured depository lending institutions, they provide micro and social finance services to their members by making available small loans to legal persons such as small owners (Mazure, 2011; Williams, 2014). On the other hand, the 1960s gave witness to the U.S. government cooperative and credit union development through its foreign assistance legislation that included Canada, Australia, and other nations to form the international credit union system. Unlike the United States, the credit rating agencies within the EU have a better handle on conducting credit checks (Staikouras, 2012). The institution of a credit union supports the small business owners and persons who are financially marginalized, as well as help the European Commission to develop and expand micro-credit in many EU regions.

A historical search for small business credit calls reflection upon a credit union as a yardstick to study small business lending. With regards to the issues of consolidation, the banking industry has a concern that small businesses are less able to obtain credit as larger or non-local banks acquire community banks. The limitations of small businesses are attributed to historical symbolism and the lack of a long track record, leaving them often unknown to their local communities. The only medium to ensure communication was through lending officers' interactions, which banks have found profitable to have this lending relationship with small businesses. Despite banks' competitive edge and the liberal policy of the National Credit Union Administration, the development of credit unions has become an important source of banking and financial services in many developed countries (Goddard, McKillop, & Wilson, 2014). Though large and small

banks engage in small business lending, larger banks charge lower loan rates and require collateral less often than small banks, attributable to former U.S. President Obama who proposed the sum of $30 billion to assist small business lending after the 2008 financial crisis (Bach, 2014). Despite the merger of banks to benefit small business financing, theoretical work suggests that relationship lending is more common at the small bank level than at large complex organizations.

With a new area in small business lending, social entrepreneurship examines how small businesses develop in the economy. Social entrepreneurship is responsible in helping underprivileged small business owners and hence improve the economy in the long run. In the United States, entrepreneurship is frequent, for 1 in every 9 people are self-employed (Fargione, Lehman, & Polasky, 2011). As stated in stakeholder theory, the benefits of social entrepreneurship are to achieve outcomes and overcome, or limit, negative influences on the physical environment (Mahoney, 2010; Surroca, Tribo, & Waddock, 2010). Nevertheless, entrepreneurial activities target areas of social need but eventually lead to the marketization of nonprofit organizations that do not then satisfy societal needs.

Table 2

Value of Small Business Loans Outstanding by Loan Types and Size through 2014 (Billions of Dollars, Nominal)

Loan type & size	2012q1	2012q2	2012q3	2012q4	2013q1	2013q2	2013q3	2013q4	2014q1	2014q2
Commercial real estate										

Under $100,000	18.6	18.0	17.9	17.5	17.0	16.8	16.4	16.3	16.1	15.8
$100,000 – $250,000	53.8	53.1	52.6	51.9	51.2	50.5	50.3	50.0	49.5	49.3
$250,000 – $1 m	238.5	236.7	235.1	232.8	230.8	229.3	228.5	228.5	227.5	226.8
Total commercial real estate	311.0	307.8	305.7	302.2	299.0	296.6	295.2	294.8	293.0	291.8
Commercial & industrial										
Under $100,000	120.0	120.2	119.5	120.2	122.9	124.1	122.8	125.2	126.7	129.6
$100,000 – $250,000	45.8	46.5	46.0	47.0	46.8	47.2	46.4	46.7	47.7	48.3
$250,000 – $1 m	113.3	114.0	113.5	117.2	115.7	116.7	114.6	115.1	117.4	120.0
Total commercial & industrial	279.1	280.6	279.0	284.3	285.3	288.1	283.9	287.0	291.8	297.9
Total small business loans ($1 m or less)	590.1	588.5	584.7	586.5	584.3	584.7	579.1	581.9	584.8	589.7
Total large business loans (greater than $1 m)	1,840.9	1,893.6	1,928.8	1,995.0	2,021.1	2,061.3	2,084.5	2,126.3	2,146.7	2,199.9

Total business loans	2,431.0	2,481.4	2,512.9	2,581.0	2,605.4	2,646.6	2,664.3	2,708.7	2,732.0	2,789.7
Total assets of depository lenders	12,066.5	12,187.5	12,310.7	25,187.4	12,582.8	12,618.3	12,809.8	12,939.2	13,104.4	13,364.7
Number of BHCs & independent lenders	6,681	6,639	6,581	6,502	6,460	6,403	6,369	6,301	6,246	6,185

Note. BHC = bank holding company. Adapted from Federal Deposit Insurance Corporation, Statistics on Depository Institutions (June 2012 through June 2014).

On the other hand, the socioeconomics of small business lending is essential as it stimulates changes in the financial sector. In a comparative study from 2003–2013, the contributions from private and public sector banks helped the socioeconomics of India to grow. A further study cited a relationship improvement between non-performing assets (NPA) and return on assets of banks. Nevertheless, the socioeconomic responsiveness and its impact on NPA level have been increasing between social compulsion and NPA level. As well, declines in bank health do affect borrowers' voluntary disclosures. Lo (2014), in trying to explore the eroding lending relationships between borrowers and their lenders, cited that "when banking relationships are threatened, borrowers must turn to new funding sources, inducing them to reconsider their disclosure policies" (p. 542).

Table 2 demonstrated changes in dollar values based on the report definition concept, officially known as the report of condition and income, on the lending size for small business for the indicated period. Many factors account for the changes in dollar amount, and the interest payment from tax savings could have a significant impact on the decision of the business to take on high levels of debt. Nevertheless, bank lending took a

new turn in 2007 in the wake of a subprime financial crisis. At that point, global measures under the Basel Accord framework were taken to guide the sufficiency of adequate capital in sustaining the ailing banking industry (Maredza, 2016).

The CRA formed in 1977 along with the charge to serve the credit needs of low- and moderate-income areas, including traditionally excluded minority residential areas (Bates & Robb, 2015). Though the CRA was formed to address the credit needs of low- and moderate-income areas, the inability to access credit and liquidity continue to be challenging problems, especially in small businesses lending (Cortes & McKinnis, 2012).

Table 3

Value of Small Business Loans Outstanding (CRE and C&I), 2008–2013

Loan type & size at origination	2008	2009	2010	2011	2012	2013	Change 2012–2013 Amount	%
Commercial real estate								
Less than $100,000	28.5	26.4	22.1	19.8	18.0	16.8	-1.2	-6.7
$100,000–$250,000	68.6	67.1	59.6	56.4	53.1	50.5	-2.6	-4.9
$250,000–$1 m	277.9	278.4	260.5	247.8	236.7	229.3	-7.4	-3.1
Total small commercial real estate	375.0	372.0	342.3	323.9	307.8	296.6	-11.2	-3.6
Commercial & industrial								
Less than $100,000	141.7	134.5	137.2	119.8	120.2	124.1	3.9	3.2

$100,000–$250,000	57.3	55.1	51.2	47.3	46.3	47.3	1.0	2.2
$250,000 to $1 m	137.4	133.6	121.6	116.0	113.5	117.3	3.8	3.3
Total small commercial & industrial	336.4	323.2	309.9	283.0	280.1	288.7	8.7	3.1
Total small business loans ($1 m or less)	711.5	695.2	652.2	606.9	587.8	585.3	-2.5	-0.4
Total large business loans (greater than $1 m)	1,797.8	1,755.3	1.599.1	1,691.2	1,893.6	2,061.3	167.7	8.9
Total business loans	2,509.3	2,450.6	2,251.3	2,298.2	2,481.5	2,646.6	165.2	6.7
Total assets of depository lenders	11,708.4	11,905.1	11,707.5	11,816.8	12,187.5	12,618.3	430.8	3.5
Number of BHCs & independent lenders	7,360	7,224	7,023	6,826	6,639	6,403	-236.0	-3.6

Note. CRE = commercial real estate; C&I = commercial and industrial; BHC = bank holding company. Adapted from Federal Deposit Insurance Corporation, Statistics on Depository Institutions (June 2008 through June 2013).

Table 3 enumerated the different facets of small business loan type, according to loan sizes, and extended to point out the differences and percentages of the value of the loan to each loan asset. In the wake of the financial crisis of 2007, outstanding loans to small businesses by commercial banks dropped sharply. Though large loans outstanding began to rise by the third quarter of 2010, small loans outstanding were on the decline.

According to the results from McNulty, Murdock, and Richie (2013), the propensity to lend to small business declines as banks increase and the growth in small business lending does not match in the same regard to the growth in bank size.

Based on the SSBF, large banks did most small business lending. Accordingly, many researchers in their studies evaluate the propensity to lend to SMEs as a ratio of small business loans to the total assets. A more comprehensive data source, such as the bank call report with federal regulators, provides a better analysis of the relationship between lending propensity and bank asset size. The ratio includes investment assets, trading account assets, and other assets that would reflect a significant portion of large banks.

Table 4

Total Asset Ratios, 2008–2013 (Value of Small Business Loans Outstanding to the Value of Total Lender Assets, Percent)

Loan type & size	2008	2009	2010	2011	2012	2013	Change 2012–2013 Difference	%
Commercial real estate								
Less than $100,000	1.61	1.48	1.37	1.21	1.13	1.07	-0.06	-5.3
$100,000–$250,000	1.81	1.80	1.77	1.74	1.66	1.63	-0.03	-1.8
$250,000–$1 m	5.91	6.14	6.14	6.01	5.82	5.73	-0.09	-1.5
Total small commercial real estate	9.33	9.42	9.28	8.96	8.61	8.43	-0.18	-2.1

Commercial & industrial								
Less than $100,000	2.69	2.40	2.22	1.99	1.86	1.80	-0.06	-3.2
$100,000–$250,000	1.40	1.34	1.27	1.21	1.16	1.15	-0.01	-0.9
$250,000–$1 m	2.85	2.73	2.58	2.47	2.37	2.35	-0.02	-0.8
Total small commercial & industrial	6.94	6.47	6.06	5.67	5.39	5.30	-0.09	-1.7
Total small business loans	16.27	15.89	15.34	14.63	14.00	13.73	-0.27	-1.9

Note. Adapted from Federal Depository Insurance Corporation, Statistics on Depository Institutions (June 2008 through June 2013).

Table 4 reflects the call report in which the concept of total asset ratios was discussed. In the report, the performance of a small business lender is measured as a percentage of the total assets and total business loans. The measure of the total amount of small business loans to the lender's total assets is the total asset ratio—a portion representative of the lender's assets that is allocated to small business loans. The total asset ratio has declined for lenders in all asset size categories as lender size increases (Williams, 2014).

The studies by Kaya and Banerjee (2012, 2014) discuss U.S. manufacturing firms' short-term assets, liabilities, term structure of debt, and liquidity management ratios as they affect firm size, profitability, tangibility, market-to-book ratio, and leverage. The study is a continuation of the impact of business cycles on the assets of retail and wholesale trade firms. The Federal Reserve played a role in its policy on firm's

short-term financial management (with regards to cash and short-term investment), accounts receivable, inventories, account payables, term structures of debt holding, and liquidity ratios.

The effort to review the implication of policymakers as well as managers on a firm's characteristics to include the financial management measures in the review—short-term assets, liabilities, term structures of debt holdings, and liquidity ratios—gained support. Nevertheless, it is advisable in the recovery stage for firms to adopt the asset-liability management strategies during the decline of a business circle. Furthermore, the study indicated that a rise in the interest rate does increase the amount of accounts receivable through the increased demand for trade credit, as uncovered in Swedish listed companies (Rimo & Panbunyuen, 2010).

Theoretical Foundation

Consistent with quantitative research, I sought the use of theory (a set of constructs) to specify the relationships that existed among the variables in my research to explain research phenomena. The main assumption in this study's model was that small business lending and credit constraints are built based on economic transaction models, with potential cost components driving the outcome of the paradigm, as reflected in the seminal works of Stiglitz and Weiss (1981) and Steijvers and Voordeckers (2009). The cost components associated with the model include writing small business contracts, negotiating, monitoring, and enforcing contracts. In the model, the rationale is that CR provides a solution to the age-old small business credit constraint in a market driven by improper information gathering. To substantiate the effect of CR on small business,

Becchetti, Garcia, and Trovato (2011), in analyzing the attitude of small businesses towards credit constraint, posited that "commercial banks may ration credit and fix a nonmarket-clearing lending rate that create excess demand for loans because they know that a higher interest rate could create a moral hazard and adverse selection" (p. 1222). It follows that CR presents some issues on small business credit because there is always an existence of disequilibrium between the amounts of supply and demand in loanable funds for each borrower of financial obligation regardless of credit.

In this study, I addressed the theoretical reasoning of small business credit lending by overviewing CR in an LGS setting. Though credit problems may persist, loan guarantee remains a viable tool in relaxing the constraints for SMEs, and the use of personal guarantees is an indication of transaction-based lending (Peltoniemi & Vieru, 2013). Improper information gathering may have a negative impact on small business credit and, with greater uncertainty during business cycles, may potentially exacerbate CR (Craig, Jackson, & Thomson, 2011). Overall, informational problems in small business credit can produce a market equilibrium that potentially causes lenders to undersupply loans with enough severity that leads to CR and consequently credit market failure.

In debt financing, credit risk has been manifested as the underlining problem for small business. The continuously evolving economic conditions in which firms operate their idiosyncratic nature and even the efforts of small businesses to change firm-specific characteristics are subject to uncertainty (Quijano, 2013). Credit risk in small businesses is of particular interest to U.S. financial institutions because 24.9% of small business

loans come in the form of commercial and industrial loans (June, 2011). The overall study captures and confirms capital allocation inefficiencies and reaffirmed default risk in U.S. loans portfolios as depicted in Basel II.

Literature Review

Several major studies have examined SBB and found that credit constraints played a mitigating role in the history of SBB (Antony, Klari, & Maußner, 2012). The literature of small business lending constituted hard information on the creditworthiness of borrowers. Information technology has been the primary driver for the increase in information gathering in small business borrower-lender relationships in the United States. The following terms—relationship borrowing, adverse selection, moral hazard, information asymmetry, collateral, and credit rationing—played a dominant role in this literature review.

Relationship Borrowing

Access to information technology includes but is not limited to hard information about borrower creditworthiness, which allows banks to lend with more distance to small businesses without compromising in the areas of credit, monitoring the borrowers, and intervening when necessary (DeYoung, Frame, Glennon, & Nigro, 2011). Large banks have the advantage in using hard information (informationally transparent from large, opaque firms) to process lending whereas small banks, using informationally transparent information, have the comparative advantage in lending to small, opaque firms (Berger & Black, 2011). Though lenders do use hard information as a monopolistic exploitation on small firms, small firms benefit in return from an increased credit availability because of

a better relationship. In analyzing bank-borrowing relationships, there is a comparative advantage in using hard information lending technologies (transaction-based lending), which result in an increase in the size of the firm. Overall, Gopalan, Udell, and Yerramilli (2011) indicated that "firms obtain higher loan amounts when they foam new banking relationships, while small firms experience an increase in sales growth, capital expenditure, leverage, analyst coverage, and public debt issuance subsequently" (p. 1335).

Again, technology is an important segment in resource and organizational setup for small business. In examining small businesses designed for information and communication technologies (ICTs), ICTs have single-handedly enhanced small business competitiveness (Alonso-Almeida & Llach, 2013). Furthermore, organizational impact felt like ICTs led to small firm survivability and profitability. On the contrary, the adoption and use of ICTs in small service companies have only been partially studied (Hotho & Champion, 2011; Sommer & Haug, 2011). Accordingly, small business adopting ICTs is good because ICTs are the key driver of company competitiveness, organization, and strategic development but must go hand-in-hand with staff and organizational changes.

A cross-section panel study done on banks from 1994–2002 suggested that small banks, when compared with those of larger banks, do escalate their commitments to bad loans (Ogura & Uchida, 2014). Furthermore, relational exchange arrangements are vital in their role in governing and influencing the outcome in relationship banking (Lado et al., 2008; Poppo & Zenger, 2002; Reddy & Czepiel, 1999). Large banks use standardized

quantitative criteria to assess loans applications, but small banks develop relationships with their customers by building reliance on qualitative criteria based on personal interaction with applicants when processing their loans (Berger & Udell, 1995; Cole et al., 2004). It has been shown that the result of a study was felt not in small businesses, but across small and medium-sized entrepreneurship. At this point, one can emphatically state that relationship lending, a situation where banks invest in building their relationship with borrowers, is exploited to compete in the small business loan market. A good banking relationship develops when a lender repeatedly provides credit to a firm. Rosenfeld (2014) cited "that there is the notion that banking relationships alleviate information asymmetry through continued contact with their customers" (p. 404).

Studies by Wu and Chua (2012) exploring SBB reported a second-order case of gender discrimination based on treatment meted out to U.S. small business borrowers. Indeed, sex and race discriminations are perpetuated by the officials of the banks. A 2003 NSSBF by the Federal Reserve Board resolved the gender assignment problem of lenders by charging female sole proprietorships more than their male counterparts when borrowing money to expand their businesses (Deitch & Hegewisch, 2013).

In trying to dissect the differences in small business credit rationing, it was noted that small business owners experience ethnic discriminations when obtaining a loan. Self-employment for minorities (Blacks and Hispanics) is viewed as a source of innovation and an avenue out of poverty and unemployment. However, minority-owned small businesses experienced discrimination by banks when accessing a bank loan (Mijid & Bernasek, 2013). Educational gap, lower asset level, and a smaller probability of having

self-employment are among the reasons for the discrimination between Blacks and Whites, and these reasons account for minorities to fail to succeed or make profit when compared to their White counterparts (Fairlie, Robb, & Hinson, 2010). Furthermore, many Title VII lawsuits and settlements have occurred from discrimination, resulting in organizational change in human resource departments and practice. Deitch and Hegewisch (2013), in exploring the implications of race discrimination litigation, cited that "discrimination lawsuit settlements are a potential impetus for improved diversity management policies" (p. 425). Overall, discrimination has a negative influence in changing the atmosphere of the workforce and can lead to lawsuits, which costs the system and the public in the long run.

Adverse Selection in SBB

Small businesses are faced with problems when borrowing from commercial banks. Nevertheless, the problem is more manifested in an equilibrium loan market characterized by improper information gathering, which leads to CR. The riskiness of the loan translates to a higher interest rate charged by commercial banks (Stiglitz & Weiss, 1981). Since the probability of repayment is high, it is difficult to identify borrowers who are most likely to repay these loans; hence, adverse selection occurs.

Adverse selection is the inefficiency between bank managers (agents) and the investors (principals/firm owners), arising from improper information gathering and poor contractual arrangements. Overall, the complex, dynamic principal-agent setting, along with the situations of moral hazard and adverse selection, lies on the quality of the agent's private information (Gershkov & Perry, 2012). The agent's decision to accept or

refuse a task is critical for public perception. When the problems of adverse selection and moral hazard are added, they produce a situation incentive for information revelation (Sung, 2005).

Moral Hazard Problem in SBB

Moral hazard stems from an agent's ineptitude to consider the full consequence of their actions as they relate to a borrower's risk factors. Moral hazard is an ex-post problem that occurs when borrowers do not use the funds for the designated purpose as a result of information gathered and on the terms of the contract (Ata, Korpi, Ugurlu, & Sahin, 2015). Nevertheless, when lenders are unable to monitor the operations as they appertain to lending and the process of SBB, they lack the good faith needed for the contract.

LGS

Many studies have chronicled small business lending practices amid credit constraints, but only a few studies have discussed LGS as a direct subsidization and alternative to CR (Kuo, Chen, & Sung, 2011). Financing small businesses is an important exercise for the economy. Small business loans come as an external finance from commercial banks (Peltoniemi & Vieru, 2013). The importance of guarantees in bank lending cannot be overemphasized, but the role played by adding collateral to personal guarantees (collateral guarantees) lowers the interest rate of secured loans (Calcagnini, Farabullini, & Giombini, 2014). Regarding the Basel Capital Accords and its relationship to secured loans, the role of guarantees helps determine the cost of credit availability, especially during economic crises. Overall, the issue of what role the personal guarantee

has in the context of relationship banking is still ambiguous, despite the ways the banks claim to process lending. Collateralization tools, on the other hand, help banks to assess the price and risk of a requested loan; in return, they help the banks generate fewer credit losses when compared to the effect of improper information gathering.

Owing to the erratic and seasonal cash flow of small business capital, the governments of many developing nations use CGS as a financial instrument to alleviate financial constraints for small businesses. To improve the flow of financial resources to small business includes direct and special lending programs, government-funded wholesale credit, CGS, interest subsidies, and regulative subsidies (Chen & Sung, 2011; Tunahan & Dizkirici, 2012). CGS intervening, as a measure to address market imperfection, alleviates financial constraints among small businesses (Gurmessa & Ndinda, 2014). It is important to note that the impact and role of CGS stretched beyond providing access to small enterprises, and its impact on credit guarantees for SMEs and other sectors is of theoretical importance (Tunahan & Dizkirici, 2012). Nevertheless, many developed countries of the world use CGS to alleviate credit constraints in small enterprises, such as farmers and cooperatives, making it a widely used tool by the government and other agencies to improve entrepreneurship and provide access to formal credit.

CGS has been an important tool for new and service-based industries of immediate finance without any forms of security attached in return for lending requirements. In essence, CGS enables small businesses to gain access to finance for venture creation and development (Samujh, Twiname, & Reutemann, 2012). For many

countries, it has been proven that CGS is a viable tool, in times of financial difficulties, for SMEs to access needed finance and liquidity when lending is squeezed (Arraiz, Melendez, & Stucchi, 2014). The government enables CGS initiatives to take place as it pursues the initiatives through the ministry in charge of economic and social development to set apart funds to support guarantees to disadvantaged small businesses. The initiatives that guide CGS are carefully designed to assist targeted economic activities in communities or some types of investments.

Another government mechanism arranged to finance SMEs is an LGS. According to a global study by Bannock (1997), it was reported that 85 countries claimed to have benefited from LGS between 1995 and 1997. Nevertheless, more SMEs count on a small and medium enterprise credit guarantee fund for guarantees to access debt capital from banks (Kuo et al., 2011). The government can adjust the guarantee fees and guarantee percentage to influence take-up rates of the LGS. Evidence shows that banks have developed coping mechanisms to deal with some of the difficulties associated with LGS by hedging risk (Arraiz, Melendez, & Stucchi, 2014). Finally, the issue of setting guarantee fees to accommodate findings between an appropriate balances and maintaining a reasonable guarantee capacity for supporting SMEs, without damaging their financial health, has been on the forefront.

Concerns over the provision of government programs for SMEs has created a forum for debate. Since financial institutions face high borrowing costs during economic times and low borrowing costs during recessions, the federal government could offer insurance coverage in the form of loan guarantees to ease borrowing constraints (Jia,

2012). Criticisms have arisen over the ways the federal government handles the SBA's guarantee programs such as maintaining a negative subsidy rate during the period when the agency was making a profit. It is important to emphasize that without the "zero subsidy" policy in place, the SBA loan guarantee programs generate profit for the government, and hence it is questionable when the government provides aggregate insurance relative to financial institution borrowing.

Information Asymmetries in SBB

The existence of information asymmetries in SBB has a stronghold on the poor. MFIs have been instrumental in lending to poor, opaque borrowers at the bottom of the economic pyramid (Galariotis, Villa, & Yusupov, 2011). In a credit market setting, asymmetric information arises as a failure between the lender and borrower to exchange complete and correct information (Ata, Korpi, Ugurlu, & Sahin, 2015). Though the use of collateral remains an agency mitigating tool, a large amount of debate fails to account for the social mission of microfinance in terms of contract enforcement. Although the issue of repayment remains a concern for borrowers, the rationale to continue to extend funds to those who fail induces borrowers to exert more effort as long as successful borrowers are granted access to more funds. On the contrary, a conflicting view on the concept of borrowing arises: As a relationship develops between borrowers and banks, access to better credit conditions grows, which improves lending to borrowers.

Borrowing exposure constitutes material risk concentrations within banks, and information asymmetry in a lender-borrower relationship affects the credit decision for small business owners. Since large and small firms can minimize information asymmetry,

it is important to know what firm size impacts information imperfection (Brent & Addo, 2012). On the contrary, bank consolidation on bank acquisition of soft information on small business borrowers has an impact on the merger of small banks with an opposite effect on large banks. Ogura and Uchida (2014), when explaining bank consolidation and soft information acquisition, stated that "further evidence suggests that the lack of such an effect for large banks is because large banks do not accumulate sufficient soft information irrespective of their merger experience" (p. 175). As the literature is not exhaustive from the perspective of whether a large or small firm can minimize information asymmetry better, Hochberg (2010) noted that small business, as being the engine of economic growth, needed to be encouraged because of their dominance in providing employment and social welfare for the nation. Hochberg's characterization suggests that small businesses pose a higher risk for lenders regarding higher information asymmetry, yet no empirical evidence is given to buttress the view that small firms are more efficient at minimizing information asymmetry.

Economic variables move asymmetrically over the business circle. Worldwide, it has been observed that asymmetry tends to rise quickly during a crisis but falls slowly and gradually during recovery (Ordonez, 2015). Mexico's 1994–95 crisis was a typical asymmetric case where real lending rose 70% points in four months, and investment and output per capita dropped 35% and 17% points in three quarters, respectively. Through the endogenous variables of asymmetry (lending rates, investment, and output), the construct of credit spread and innovation components orthogonal to the current state to the decline of economic activity (Turvey, Xu, Kong, & Cao, 2014). Finally, it could be

deduced that learning financial differences induces differences in the time irreversibility of endogenous variables that show up in their asymmetry.

Collateral in SBB

The use of collateral in accessing loans has been widely accepted as an important contracting tool. Collateral is a prominent feature of debt contract in residential mortgages, commercial mortgages, motor vehicle loans, and equipment loans (Berger, Frame, & Loannidou, 2011). Evidence has shown that collateral could raise the borrower's cost default; hence, a better preference is that secured debt is less likely to default, irrespective of whether ex-ante asymmetric information is indicated (Berger, Frame, & Ioannidou, 2011). Nevertheless, there are no conclusive empirical tests on whether a better bank relationship with borrowers improves when collateral is pledged.

Consistent with the contributions that entrepreneurs and micro, small, and medium-sized enterprises (MSMEs) make to the economy, a better understanding needs to be reached with respect to the factors that influence the rise and performance of MSMEs. Prior to 2001–2004, the study of Bah, Brada, and Yigit (2011) covered MSMEs in transition economies where the performance of MSMEs was limited. Microenterprises were being awarded no bank credit. Bah, Brada, and Yigit, in trying to control for selection bias for assistance to small and medium programs by the United States Agency for International Development, determined that assistance programs raised employment by 16–20% in the first year (after assistance) and by 23–30% by the third year. Based on these statistics, the number of loans is evenly distributed across classes for cash flow

loans although more loans are distributed as collateral loans. Overall, the cash flow loans appear to be the best credit option for SMEs.

The article on banking regulations from firms is a determination of what constitutes a firm's proportion of collateralized loans. Within the context of Chinese loans, the incidence of loan default has been on the increase in the past 30 years, making collateral requirements ever more important (Jianchun & Daly, 2012). Other than the developed economies of the United States and Europe, China is the biggest developing economy where changes in the banking system affect collateral. In 2003, the China Banking Regulatory Commission was regulated to monitor commercial banks and issue guidelines on due diligence in credit work of commercial banks.

Credit Rationing in SBB

Credit rationing is a situation that arises when a borrower's request for additional credit (loan) is met with a higher interest repayment. Credit rationing occurs when the demand for loans exceed its supply (Ata, Korpi, Ugurlu, & Sahin, 2015). Small businesses in regions of the developing world face different microeconomic conditions, more volatile macroeconomic situations, a less efficient market, and higher entry costs than their counterparts that live in high-income economies. Bond, Tybout, and Utar (2015) analyzed the microeconomic conditions militating against small businesses in developing economies and posited that "the literature documenting these pattern of financial development is vast" (p. 695). The findings in Jianchun and Daly (2012) reflect a dynamic structural model of entrepreneurship with uncertainty in its borrowing constraints and a wealth consensus with several dynamic general equilibrium models.

Furthermore, what Jianchun and Daly found is in line with several empirical models of dynamic industrial constraints and uncertainty with cost adjustments. Overall, it is only fair in a capital market if borrowers are evaluated in such a manner that borrowing does not exceed a fixed ratio of their entrepreneurial assets.

The problem in the banking sector arises because of the presence of information asymmetry. Accordingly, the failure of borrowers and lenders to exchange complete and correct information with each other leads to improper information gathering (Ata et al., 2015). Er (2011) stated that adverse selection and moral hazard occurs "when demands for loans exceeds the supply, and for borrowers who have agreed to repay them, credit (loan) is rationed" (p. 311). Borrowers can improve rationing with external auditing. Although costly, external auditing has the tendency to increase transparency and send a quality signal to potential lenders. St-Pierre and Bahri (2011), in analyzing the determinants of risk premium for SMEs with respect to loan size, observed that loan conditions must be based on the borrower's ability to repay and the risk of default. It is equally important to mention that the age and quality of a firm also constitutes a mitigating factor to CR.

The Review of Related Research and the Literature Comparison in SBB

The literature review brings to light the underlying reasons for small business loan denial in the study. It is humbling to discuss the role racial and ethnic differences play in accessing loans. Small businesses owned by minorities are increasing tremendously with an increase of 1.9 million Black-owned nonfarm U.S. businesses, an increase of 60.5% from 2002, and Hispanic-owned nonfarm U.S. businesses increased by 2.3 million, an

increase of 43.6% (Mijid & Bernasek, 2013). Despite the statistical increase, minority-owned businesses in the United States tend to be less successful because of higher loan denial.

Another study addressed a different type of problem based on social interaction in justifying disconnect between borrowers and lenders attributes that constitute problems in small business lending (Turvey, Xu, Kong, & Cao, 2013). With the United Nations declaring 2005 the international year of microcredit, microfinance institutions in their dynamic view extended small loans to poor, opaque borrowers with the view to advance lending to the poor with asymmetric information (Galariotis, Villa, & Yusupov, 2011). The sole purpose for MFIs to extend small unsecured loans to poor, opaque small businesses is to channel capital from profit-seeking investors and socially driven donors to those poor small business owners who lack the basic collateral to obtain funds through the conventional credit market.

Ata, Korpi, Ugurlu, and Sahin (2015) viewed the problem small businesses encountered when accessing loans to adverse selection and moral hazard, a situation that arises in the banking sector when improper information gathering occurs. Ata et al. cautioned that banks use a credit rationing mechanism to mitigate the losses that arise because of asymmetric information. Though banks use CR to mitigate asymmetric information in the credit market, it happens when borrowers and lenders fail to exchange complete and correct information.

Incidentally, the studies of Galariotis et al. (2011) and Ata et al. (2015) pointed to the effect of improper information gathering on SBB, but the outcome is felt differently.

According to Galariotis et al., with respect to MFIs, the situation in lending to small, opaque borrowers is seen as a new way of lending that imposes joint liability when mitigating the effect of asymmetric information. Similarly, Ata et al. used a credit rationing mechanism to cushion bank losses that occur due to improper information gathering.

Another study addressed a different type of problem based on social interactions in a lender-borrower relationship across a wide range of lending-related attributes which created a big problem (Turvey, Xu, Kong, & Cao, 2013). The study compared 120 loan officers at rural credit cooperatives (RCCs) in China's Shandong province and paired them with an existing survey on identical questions to 394 farm households in the same region. In the process, pairing lender perception towards borrowers, loan rejection, and memberships of RCC microcredit lending mechanism against borrowers' perception towards lenders—and how they themselves were perceived by lenders in the same regards—are observed as a disconnect in the context of lending, which invariably increased the cost of borrowing.

Borrowers' attitude towards lenders and lending can also be observed when farms in Kansas sought additional lending relationships to secure credit at a future date (Brewer, Wilson, Featherstone, & Langemeier, 2014). In the process, if either the farm or the bank believes the other is risky, the result is that the farm seeks an additional lending relationship that readily enables the farm access to credit. The study of Brewer et al. (2014) has a better outlook on lending relationships in contrast to the study done by

Turvey et al. (2013) which lacks positive emphasis and encouragement in small business lending.

The Gap in the Literature

The literature review cannot come to a conclusive summary without identifying the gaps in the research on small business lending. This study fills the current research gap by identifying LGS as an alternative to commercial bank credit rationing. With LGS, all a small business owner does to qualify for this government financing option is provide employment and social welfare to the community where they serve. Furthermore, with LGS, small business owners do not have to worry about providing collateral as a requirement to obtain loans because of the government provision for self-financing, based on the criteria of employment and social welfare to the community (Kuo et al., 2011). Unlike CR, where collateral plays a dominant role, the qualified small business pays a token called guarantee fees (premiums). Kuo et al. (2011) cited that "since guarantee fees (premiums) represent the largest cash inflow for a guarantor and the most critical index to indicate a borrower's credit status, this paper proposes a methodology that specifically aims for this self-financing target by meeting at least default costs with income from premiums" (p. 205).

It is apparent that small businesses are viewed as a source of job creation and the engine of economic growth, despite the difficulties they experience in accessing debt finance driven by financial market inefficiency. Loan guarantee programs as a major component of entrepreneurship policies offer a form of insurance protection in North America. Jia (2013) stated that the SBA provides nearly $100 billion in loans to U.S.

small business owners in the form of loan guarantees. Likewise, the Canadian Small Business Financing Program provides nearly $1 billion of guarantee funds in new loans annually. More importantly, loan guarantees could be seen as an insurance against small business aggregate risks. Jia (2013), in addressing the benefit of LGS in easing borrowing constraints during a recession, concluded that "the federal government could offer insurance in the form of loan guarantees to ease borrowing constraints for small businesses" (p. 455).

In practice, LGS provided for SMEs in a variety of ways. LGS, as recognized in the Basel Capital Accords, has the potential to determine not only the availability of small business credit, especially during economic crisis, but also the cost (Calcagnini, Farabullini, & Giombini, 2014). This process is achieved when banks use collateral and personal guarantees on the interest rate of a bank loan. A case in point is the effect of collateral guarantee and on the cost of credit for Italian firms.

Furthermore, the study explored the usefulness of LGS as insurance against aggregate risks in SMEs. As often noted with LGS, its effect in determining the cost and the availability of credit is mostly felt during economic downturns when firms experience credit constraint, mostly due to aggregate uncertainty in the economy (Cowling, 2010). Since firms encounter disproportionate difficulties in accessing debt financing, especially in North America, loan guarantee programs have become a major mechanism to shelter entrepreneurship policy as a result of financial market inefficiencies (Jia, 2013).

Conclusion

Chapter 2 discussed the relevant literature guiding the topic and terms of the study. Furthermore, Chapter 2 identified and discussed credit factors that limit the ability for small businesses to access commercial loans and loans from other lending institutions. Assumptions, theoretical frameworks, relationship lending, LGS, and collateral were discussed throughout the literature review. Information asymmetry plays a major mitigating factor in small business lending. In addition, discipline deficiency among lenders remains a deciding mechanism in awarding loan contracts to SMEs. Many small business owners lack the moral discipline when choosing from the ruling interest rate because of improper information gathering against them. The identification of these factors and the seminal work of Stiglitz and Weiss were instrumental for the methodology and statistical analyses of this study, which are discussed in Chapter 3.

Chapter 3: Research Method

Overview

The purpose of this study was to use small business data sets to quantitatively test the influence of LGS on CR, controlling for the effects of COLL and LEV. The seminal theory of CR from Stiglitz and Weiss has been dubbed "the workhorse Stiglitz-Weiss model of credit rationing" (Agur, 2012, p. 220), and it remains the theoretical framework for this study. Even though this theory was propounded in 1981, researchers have been using it since then, with Agur (2012) describing it as "the cornerstone of analytical thinking about credit rationing for nearly three decades" (p. 221). Therefore, past and current research are integrated to underpin the conceptual work in this study.

According to the theory from Stiglitz and Weiss (1981), lenders (banks) fail to extend the full amount of credit that would reflect the correct assessment of information available at the time the credit contract is done. That is, CR occurs when banks deny loans to some borrowers who have the same characteristics as those that receive the loan. In this sense, a small business loan borrower is said to be credit rationed if the demand for a loan is greater than the amount of loan offered, which is an example of loan rationing (Drakos & Giannakopoulos, 2011; Mason, 2014; Stiglitz & Weiss, 1981).

Consequently, once loan rationing occurs, problems arise such as adverse selection and moral hazards. From the past decades to the present, scholars have been wrestling with research problems related to the causes and consequences of CR. For example, Ferri and Murro (1980) concluded more than three decades ago that "the recent survey by Baltensperger shows that the question of why bankers undertake non-price

rationing of credit is still very much unanswered" (p. 471). It may be argued that the Stiglitz and Weiss theory of CR is old. Scholars recognize this fact but express their concern that no recent theory on CR has been propounded to replace it, with Agur (2012) concluding that "in particular, the model of Stiglitz & Weiss (1981; henceforth SW) has been the cornerstone of analytical thinking about credit rationing for nearly three decades" and explicitly stating that the Stiglitz and Weiss model "is certainly the best known and most often applied model" (p. 221). Therefore, the present study makes a contribution towards filling the long-standing research gap on the causes and consequences of small business credit rationing using the theoretical underpinning of Stiglitz and Weiss's 1981 theory on CR.

Five major sections make up this chapter. The first section deals with the research design and rationale. The second section deals with the population as well as the sampling and sampling procedures. The third section presents the procedures for recruitment of participants and data collection procedures. The fourth section covers the operationalization of constructs. Finally, the fifth section discusses the data analysis plan and threats to validity and ends with a summary.

Research Design and Rationale

It has been well established that a sound research design should begin with the definition of the problem for the study (Field, 2013; Singh, 2007). Following this suggestion, I allowed the potential solution to the research problem to suggest the suitable methodology for this study. That is, the research problem should dictate the methodology used for the study, not vice versa (Babbie, 2010; Field, 2013).

Several methodological issues arose when contemplating the research design and rationale for this study. As in other empirical research, the epicenter of this study is the CR of small businesses. Evidently, the operationalization of the dependent variable (CR) demands metrics or hard data, which is difficult to find (Park & Coleman, 2009; Petrick, 2005). Indeed, Park and Coleman (2009) declared that "researchers cannot always observe how much credit a firm needs or how much of that need is met by the credit supplied by the bank" (p. 259). Therefore, the design of this study must seriously consider where and how to gather the proper data set in a manner that data can be physically observed and then extracted from the source (Petrick, 2005).

With these data stipulations in mind, it does appear that this study requires an archival data set. The dependent variable (CR) should be measured as observable metric data as opposed to survey-based perceptual data (Drakos & Giannakopoulos, 2011; Ferri & Murro, 2015; Mason, 2013). Surely, perceptual (belief) data would be inferior to metric or hard observable data, as perceptual data would raise more problems related to non-response rate and potential validity and reliability concerns inherent in postal survey questionnaire data sets, among other issues. With this statement in mind, this chapter begins with providing information on the survey design, settings, and the statistical analysis techniques for data analysis.

Research Setting

The setting for this archival-based, non-experimental, non-survey-based study was the population of small businesses that have been credit rationed in Florida in 2015. The reason for selecting this setting is that a literature search revealed that the study's

setting must have sampling frames capable of providing firm-level archival data on the population of small businesses that have been credit rationed in Florida in 2015. The following sampling frames emerged from the literature search: SSBF by the Federal Reserve Bank (FED), and the SBA databases (SBA, 2016b).

However, it must be explicitly emphasized that the measurement of almost all the variables involved in the present study require data from firm-level balance sheet entries. Therefore, the research setting must focus on balance sheet information submitted to the lender banks by small businesses when loan applications were submitted to the lender banks. Hence, archival data for this study was gathered in a stepwise procedure from the two sampling frames.

Methodology

Population

Interestingly, Singleton and Straits (2005) discussed a useful two-step sampling approach to guide researchers. Specifically, they suggested that the first step in sampling is to clearly determine the particular collection of units that make up the population of interest of the study. The sound research approach should start from the top at the population and work downward to the sample (Bailey, 1982; Easterby-Smith, Thorpe, & Jackson, 2008). To define the target population of interest to the study, the researcher must first specify the criteria for determining which units should be included in the population for the study (Singleton & Straits, 2005). In this study, the units to be included in the target population were the small business firms within Florida. Another reason the identification and clarification of the target population is critical—it is the specific

population from where the researcher would eventually generalize or extrapolate the results of the study obtained from the sample to that specific population (Bailey, 1982; Churchill, 1979; Easterby-Smith et al., 2008; Field, 2013; Mijid & Alexandra, 2013)

Finally, key information culled from Singleton and Straits (2005) suggests that the construction of the sampling frame is the second step in defining the sample for this study. Hence, the sampling frame pinpoints the set of cases from which the sample is to be drawn. For the sake of clarification, the sampling frame is not a sample, but an operational definition of the population that provides the basis for sampling (Field, 2013; Singleton & Straits, 2005).

Sampling and Sampling Procedure

The first aspect about sampling is the identification of the population from where the sample should be drawn (Simon & Goes, 2013). Second is to explicitly discuss the procedure of sampling from that population (Simon & Goes, 2013). Hence, following this procedure, the population for this study was the small businesses in Florida that are credit rationed in 2015.

The population of this study was found in the following archival locations: NSSBF and the FED. It is public knowledge that the FED conducts its SSBF every five years (Mills & McCarthy, 2014; Park & Coleman, 2009). The NSSBF database defines small business firms as firms with 500 or fewer employees. Additionally, in using this database, Park and Coleman (2009) commented that the NSSBF “is the largest and most comprehensive data set of its type representing a national sample of firms stratified by geographic region, industry sector, gender, and race” (pp. 257–8).

Likewise, Mills and McCarthy (2014) recently commented on the richness of information in the NSSBF database, declaring that "one of the best pictures we have of sources and uses of credit by small businesses is the Federal Reserve's National Survey of Small Business Finances, which, while dated as of 2003, indicates that about 60 percent of small businesses use term loans to finance their operations" (p. 18). Evidently, "the best pictures" in the NSSBF database relate to the following data on firm characteristics, including, but not limited to, firm size, firm age, profitability, metropolitan statistical area, industry type, sales, assets, and more (Park & Coleman, 2009). Overall, the NSSBF databases have the information on the variables to be operationalized for this study. However, in the highly unlikely event that the variables of this study were not available in the NSSBF databases, the same data pertinent to this study were extracted from the SBA databases. Surely, in designing this study, months of literature and databases searches revealed that the NSSBF and SBA databases store archival data pertinent to this study, as confirmed by other scholars (e.g., Mills & McCarthy, 2014; Park & Coleman, 2009).

Second, some of the data are available for a fee in websites such as www.whodoessbaloans.com. Beyond this source, SBA officers are willing to assist students who need help with data for purely academic purposes. For example, the office of Mr. Miguel Gonzalez [(305) 536-5521, ext. 141] in Miami, Florida assists students who may need data for academic research. Furthermore, the South Florida Small Business Resource Guide contains information on active SBA lenders to small businesses, including information on loans applied for as well as loans received by small

businesses in Florida. Again, the archival data are ready-made data for assisting students for research purposes and involving no procedure for recruitment in data collection for the study.

Third, and finally, the population is found on SBA (SBA, 2016b). For this study, the SBA link demands explanation as to why the data is incomplete for the variables shown in Equation 7. The immediate feature to be noticed from this SBA link is that it contains archival data on small business loans extended to small businesses not only in Florida but the entire United States and its territories. Second, small business loans fall into two broad categories—the SBA 7(a) program and the SBA 504 small business loan programs. Even though SBA 7(a) and SBA 504 are related, these are different small business loan business programs.

Institutional Review Board (IRB) Approval

Conditional to the dissertation committee approval of this dissertation proposal, the proposal was submitted to Walden University's IRB and approved with an identification authorization number (Walden IRB approval no. 03-20-17-0194918). Following this process adhered the study to Walden University's guidelines and rules.

SBA 7(a) Program

This study focused on the SBA 7(a) program because it is said to be "the SBA's primary program for helping start-up and existing small businesses with financing guaranteed for a variety of general business purposes" (SBA, 2016a). Hence, because SBA 7(a) is the primary program for small business loan guarantee programs, this study focused solely on it. Table 5 presents variables and definitions of the SBA 7(a) program

relevant to this study.

Table 5

SBA 7(a) Variables and Definitions

Field name	Definition
Program	Indicator of whether the loan was approved under SBA's 7(a) or 504 loan program
BorrName	Borrower name
BorrStreet	Borrower street address
BorrCity	Borrower city
BorrState	Borrower state
BorrZip	Borrower zip code
ThirdPartyLender_Name	Name of third party lender
ThirdPartyLender_City	Third party lender city
ThirdPartyLender_State	Third party lender state
ThirdPartyDollars	Third party loan amount
GrossApproval	SBA loan amount
ApprovalDate	Date the loan was approved
ApprovalFiscalYear	Fiscal year the loan was approved
ProjectCounty	County where project occurs
ProjectState	State where project occurs

Note. Adapted from "SBA 7(a) & 504 loan data reports," by Small Business Administration [SBA], 2016.

It is noteworthy to underscore that the variables in Table 5, and hence the data in SBA 7(a), did not include all the variables in Equation 7. This incompleteness of variables and data from SBA 7(a) demanded that those missing variables be sampled elsewhere. For this reason, Table 6 presents the study variables and the sources where they are to be sampled.

Table 6

Data Sources of the Study Variables

Study variables	Data sources
(1) Credit rationing (CR)	The bank that gave the loan

Credit extended/credit requested	Balance sheet of the bank that gave the loan
(2) Loan guarantee scheme (LGS) Yes or no	Balance sheet of the bank that gave the loan and/or the SBA 7(a) program
(3) Collateral (COLL) Yes or no	Balance sheet of the bank that gave the loan
(4) Leverage (LEV) Total debt/total equity	Balance sheet of the bank that gave the loan

It is noteworthy that these variables and data absent in SBA 7(a) are from micro-firm level balance sheet entries, obtainable only from the small businesses directly or from the applications for loans submitted to the lender banks, as was done in recent peer-reviewed research on small business credit rationing (Kirschenmann, 2016). Therefore, the present study proposed to follow the sampling procedure detailed from Kirschenmann.

Firm-Level Balance Sheet Data and Variable Measurements

The data sources from Table 6 strongly indicated that it appeared prudent to use the SBA 7(a) program link to identify the banks that gave loans to the small business recipients. Second, with the lender banks' contact information at hand, then approach the banks for the balance sheet information given to them when loan applications were made with them, an approach that has precedent in Kirschenmann (2016).

Additionally, as can be seen in Table 6, the operationalization of the dependent, independent, and control variables for the present study required data from firm-level

balance sheet entries of the small businesses kept by the bankers. Again, this information is absent in the SBA 7(a) publicly available databases but are available in the small business balance sheets kept by the lender banks, as observed by Kirschenmann (2016). Discussing this, Kirschenmann stated in her panel data study:

> The data set used in this study comprises all of the small annuity loans, credit lines, and overdrafts with amounts up to 50,000 euros extended to firms by one Bulgarian bank (henceforth called the "Bank") between April 2003 and September 2007. The Bank is a nationwide commercial, full-service bank that focuses on lending to micro, small and medium firms. (p. 71).

Summary of Kirschenmann (2016)

It does appear that a summary of Kirschenmann (2016) informs the present study, as the present study followed Kirschenmann. Kirschenmann's unique data set use of matched loan applications and contracts to investigate loan rationing on small firms by banks in Finland informed the present study. Her research objective was to empirically investigate the extent (magnitude) of small firm loan rationing in their relationship with those banks. The magnitude of loan rationing was functionally specified as the relationship between the requested loan amounts of small firms compared to the loan amount granted by the bank to the firm. The difference between these two quantities—namely, requested and granted—was the index for loan rationing. As in the present study, the ratio of the granted (G) and the requested (R) was a measure of the dependent variable (loan rationing). This ratio (G/R) would then be expressed as a percent or proportion so that it can be linearly related to the right-hand-side independent variable(s)

and control variables. This specification is the same as in the present study, even though the variables of interest may differ.

To sum up the sampling strategy for the present study, two-step procedures were followed. In the first step, small business lender banks were identified from loan data reports from the SBA (SBA, 2016b). In the second step, a random sample of about 300 credit-rationed small businesses in Florida from 2015 was drawn from the population of credit-rationed small businesses in the archives of these lender banks. Due to the inability to determine the sampling frame for the sample population of small businesses in Florida, a robust sample size of about 300 was considered proportionate to a population of 1,072 reflecting the small businesses who were credit constrained in 2015. The G*Power sample size software program enhanced in the study served as a guide to achieving the appropriate robust sample for the research (Faul et al., 2009). The population and the sample comprised of micro-level balance data submitted to the lender bank when the small businesses submitted their loan applications to the lender banks.

Consequently, from this population, about 300 randomly drawn, credit-rationed small businesses should have data on the following variables for this study:

(1) Credit rationing (CR): measured by credit extended/credit requested

(2) Loan guarantee scheme (LGS): binary measure (yes or no)

(3) Collateral (COLL): binary measure (yes or no)

(4) Leverage (LEV): total debt/total equity

Instrumentation and Operationalization of Constructs

As shown in Figure 2, the present study involves a dependent variable (CR), an independent variable (LGS), and two control variables (COLL and LEV).

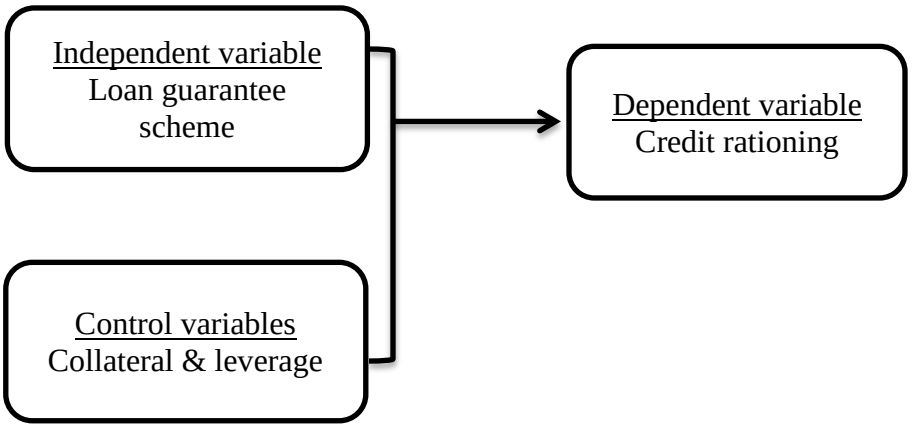

Figure 2. Influence of LGS on CR, controlling for COLL and LEV.

The model in Figure 2 is based on the theory of CR proposed by Stiglitz and Weiss (1981). Each variable is operationalized in the following subsections.

Dependent Variable Operationalization

According to the CR theory of Stiglitz and Weiss (1981), a typical small business owner is credit rationed if the amount of loan that he or she applied for is less than the amount of loan that he or she received from the bank. Much of the empirical literature on CR has used this operationalization of CR (e.g., Drakos & Giannakopoulos, 2011; Ferri & Murro, 2015; Mason, 2013; Park & Coleman, 2009). Therefore, following these researchers, this study operationalizes CR as a ratio of the amount of credit extended (received) by the small business divided by the amount of credit requested by the small business (as shown in Equation 7). Therefore, it is critical to underscore one important

key element of this ratio expressed in Equation 7—the lower the ratio, the higher its CR (and vice versa). On this note, recent research on small business credit rationing characterized this ratio as "an inverse measure of credit rationing with smaller values indicating tighter rationing (Kirschenmann, 2016, p. 74). Thus, the nature of this ratio guided the understanding of how the independent variable and the control variables should influence the dependent variable (CR) as a ratio.

Specifically, operationalization of this CR ratio required the extraction of data on the numerator and the denominator of this ratio. The data for the numerator and denominator of this CR ratio were extracted from the data sources discussed under the "Sampling and Sampling Procedure" subsection of this study.

Independent Variable Operationalization

As shown in Figure 2, the independent variable of this study was LGS. Importantly, LGS is a binary variable whereby the small business either receives or does not receive LGS. Therefore, LGS was operationalized as a 1/0 binary variable. The data for this binary LGS participation were extracted from the data sources discussed under the "Sampling and Sampling Procedure" subsection of this study.

Operationalization of Control Variable, COLL

As shown in Figure 2, a small business faces a choice to either use or not use COLL to secure a loan. Therefore, COLL is a binary variable such that the small business uses or does not use collateral. Therefore, COLL was operationalized as a 1/0 binary variable. The data for this use or non-use of COLL were extracted from the data sources discussed under the "Sampling and Sampling Procedure" subsection of this study.

Operationalization of Control Variable, LEV

As shown in Figure 2, LEV is operationalized as a ratio of debt to equity for small businesses. Therefore, it is critically important to stress that, for this study, the higher this ratio, the greater the LEV and vice versa. This way, the expected influence of LEV on the dependent variable is clearer to understand and interpret. Finally, this operationalization of this LEV ratio required the extraction of data on the numerator (debt) and denominator (equity). Hence, the data for the numerator and denominator of this LEV ratio were extracted from the data sources discussed under the "Sampling and Sampling Procedure" subsection of this study.

Data Analysis and Plan

Data analyses were done using the SPSS statistical software program. Beginning with data cleaning to ensure that all cells in the SPSS spreadsheet contained the correct inputs, only then were descriptive statistics computed. Specifically, measures of central tendency (mean, median, etc.) were computed and reported as numbered tables for the small businesses in this study. Following this, the focus shifted to the research question as well as the null and the alternative hypotheses.

Multiple Regression Analysis Assumptions

All forms of multiple regressions hinge on one common fundamental assumption of normality. This must be checked to ensure that this critical assumption is met to justify the use of all parametric statistical tests. This is so because parametric tests rest on the existence of the normal curve in distributions of the variables in the population from where the sample was drawn. Theory and empirical perspectives suggest that tests of

multiple regression assumptions should begin when data entry into the SPSS spreadsheets (or whatever the statistical software and spreadsheet) are in focus.

Since hierarchical multiple regression analysis (HMRA) was the statistical technique used for this study, the assumptions of outliers and normality of residuals underlying this technique were evaluated accordingly.

The study was checked on whether there were influential outliers present in the variables for this study. Surely, outliers are extreme values of variables operationalized in the study. These extreme values distort expected values of the sample central tendency in the study (Field, 2013). For this reason, outliers must be checked. Sometimes, these outliers occur because of reckless data entry into the spreadsheets of the statistical software program being used. (For example, the number 11 is typed when the intent is to type number 1, or vice versa.) Data entry must be checked for the existence of outliers. When outliers are revealed, they must be correctly coded before any tests are conducted to check for normality. When outliers are corrected, then a retest for normality is done.

If normality is not met after the outliers are corrected, then various forms of transformations exist to "force" the data to conform to the normality assumptions, (e.g., model builders may force the distribution to be normal, even though the distribution is not normal in the real world). As stated by Box (1976):

> …Equally, the statistician knows, for example, that in nature there never was a normal distribution, there never was a straight line, yet with normal and linear assumptions, known to be force, he can often derive results which match, to a useful approximation, those found in the real world… (p. 792)

The literature has full discussions of these issues, especially as they relate to the importance of the difference between statistical significance and practical significance, as well as their implications to large samples and *p*-values in empirical research (Lin et al., 2013).

As established in the literature, only the observed residual (not the unobserved errors) was checked to assure that it is normally distributed (Field, 2013; Francis, 2013). Evidently, however, normality of the observed residuals was evaluated. In SPSS, normality of residuals was assessed using a histogram and p-p plot of standardized residuals plots (Field, 2013; Francis, 2013).

Using the "Explore" subcommand from the "Descriptive Statistics" command in SPSS, the following procedures were conducted to examine the histograms for each variable: Analyze > Descriptive > Explore > Statistics > Check Outlier Box > Continue > Plot > Descriptive > Histogram.

The "Histogram" subcommand informs the degree to which each variable in the study deviates from a normal distribution in the important sense of being negatively or positively skewed. First, if the variable in question is negatively skewed, then a reflection procedure is done to reverse (reflect) the negatively skewed values to become positively skewed. Second, once the variable in question is now positively skewed, any form of transformation can then be performed on the variable to "force" it to be normally distributed.

Technically, the mathematics of reflection can be achieved in SPSS. First, using the "Frequencies" subcommand in the "Descriptive Statistics" menu, locate the largest

value on the variable of interest (e.g., say 15). The largest value should be negative as to contribute to the negative skew in question. Second, convert to positive if it is negative so that the absolute value becomes 15. Third, add positive 1 to it (16 in this example). Finally, subtract all the values of the data points from that variable from 16. The result is reflected as a positively skewed distribution for that variable. Any form of the appropriate transformations may now be applied to transform that variable to be normally distributed.

The type of transformation to be applied to the data is dependent on the degree of excessive skew. Tabachnick and Fidell (2007) suggested various forms of transformations suitable to levels of skew or non-normality in a particular data set (Table 7).

Table 7

Data Distributions and Likely Transformations

Moderate positive skew	Square root transformation
Substantially positive skew	Logarithmic (log 10) transformation
Substantially positive skew (with zero values)	Logarithmic (log 10) transformation (add a constant to log 10); log 10 (x + c)
Moderate negative skew	Square root transformation
Substantially negative skew	Logarithmic (log 10) transformation

For this study, various separate figures were produced to report the SPSS results of these tests when the procedure is conducted on the archival data.

Research Questions and Hypotheses

For the study, the following three research questions and hypotheses were investigated.

Research Question 1

RQ_1: Is there any relationship (influence) of LGS on CR, controlling for COLL and LEV?

Null Hypothesis 1

$H0_1$: There is no relationship (influence) of LGS on CR, controlling for COLL and LEV.

Alternative Hypothesis 1

H_1: There is a relationship (influence) of LGS on CR, controlling for COLL and LEV.

Research Question 2

RQ_2: Is there any relationship (influence) of COLL on CR?

Null Hypothesis 2

$H0_2$: There is no relationship (influence) of COLL on CR.

Alternative Hypothesis 2

H_2: There is a relationship (influence) of COLL on CR.

Research Question 3

RQ_3: Is there any relationship (influence) of LEV on CR?

Null Hypothesis 3

$H0_3$: There is no relationship (influence) of LEV on CR.

Alternative Hypothesis 3

H_3: There is a relationship (influence) of LEV on CR.

Criteria for the Rejection or Acceptance of Null and Alternative Hypotheses

It is important to note, going forward, that Equations 1, 3, and 5 are self-explanatory partial derivatives of the numerator with respect to the denominator set equal to zero. In other words, the relationship between the dependent variable (the numerator) and the independent variable (the denominator) was zero, and that was in line with the concept of null hypothesis introduced decades ago (Fisher, 1956).

Hypothesis 1

The following criteria were used to reject or accept the null hypothesis, $H0_1$, and alternative hypothesis, H_1. Keeping in mind that a linear relationship is assumed between the dependent variable (CR) and all the other variables in the study (LGS, COLL, LEV), $H0_1$ was rejected if the following pattern of partial derivatives between CR and LGS holds:

$$\frac{\partial \text{CR}}{\partial \text{LGS}} = 0 \tag{8}$$

Furthermore, H_1 was accepted if the following pattern of partial derivatives between CR and LGS holds:

$$\frac{\partial \text{CR}}{\partial \text{LGS}} > 0 \tag{9}$$

Hypothesis 2

The following criteria were used to reject or accept the null hypothesis, $H0_2$, and alternative hypothesis, H_2. Again, keeping in mind that a linear relationship is assumed between the dependent variable (CR) and all the other variables in the study (LGS,

COLL, LEV), $H0_2$ was rejected if the following pattern of partial derivative exists between CR and COLL:

$$\frac{\partial CR}{\partial COLL} = 0 \quad (10)$$

Similarly, H_2 was accepted if the following pattern of partial derivative was found between CR and COLL:

$$\frac{\partial CR}{\partial COLL} > 0 \quad (11)$$

Hypothesis 3

The following criteria were used to reject or accept the null hypothesis, $H0_3$, and alternative hypothesis, H_3. Again, keeping in mind that a linear relationship is assumed between the dependent variable (CR) and all the other variables in the study (LGS, COLL, LEV), $H0_3$ was rejected if the following pattern of partial derivative exists between CR and LEV:

$$\frac{\partial CR}{\partial LEV} = 0 \quad (12)$$

In the same manner, H_3 was accepted if the following pattern of partial derivative was found between CR and LEV:

$$\frac{\partial CR}{\partial LEV} > 0 \quad (13)$$

Statistical Tests for Hypotheses

To enhance the readability of this chapter, Equation 7 (renumbered to Equation 14) is reproduced here so that there is a sharper focus on how the statistical tests were performed, as well as an explanation of each term. Hence, Equation 14:

$$\boldsymbol{CR = \beta_0 + \beta_1 LGS + \beta_2 COLL + \beta_3 LEV + \varepsilon} \quad (14)$$

Where,

CR: Credit rationing (dependent variable) was measured by the amount of credit extended to the small business divided by the amount of credit requested by the small business. This is a ratio where the numerator is credit extended and the denominator is credit requested. Focusing on this ratio, the lower the ratio, the higher the CR and vice versa. Interestingly, recent research on small business credit rationing (Kirschenmann, 2016) characterized this ratio as "an inverse measure of credit rationing with smaller values indicating tighter rationing (p. 74). Hence, the nature of this ratio informed understanding of how the independent variable and the control variables should influence the dependent variable (CR) as a ratio.

LGS: A dummy variable indicating the participation of the small business in an LGS. The operationalization of this variable entails a straightforward choice of either participation or no participation. Specifically, 1 represents "participated" and 0 "not participated." Theory and empirical settings suggest that LGS should be related to CR, according to Stiglitz and Weiss's (1981) seminal theory of CR.

COLL: A dummy variable indicating whether the loan was collateralized or not. Thus, COLL was operationalized as 1 representing "collateralized" and 0 "not

collateralized.” Under the signaling theory, collateral serves as a signaling mechanism for loan quality and as strong credit protection, even in a case where a loan may not have been approved at all.

With respect to the potential effect of COLL on CR, the picture is unclear because economists have documented instances where COLL involves risk rather than mitigating it (Helberg & Lindset, 2016). This makes the expected effect of the COLL term on CR to be uncertain and dependent on samples used.

LEV: LEV was measured by the ratio of its debt to equity. The debt to equity ratio is a term that computes the capital structure of a firm in the sense that there is an inverse relationship between the debt of a firm and its equity. The higher the debt, the lower the equity and vice versa. Because of this relationship, the debt-equity ratio paints a picture of the different sources of funds a firm uses to finance its operation.

With respect to the expected effect of debt-equity ratio or LEV to CR, the financial economic literature is unclear about the expected impact of LEV on CR. There is no optimal level of debt-equity ratio (Davydov, 2016). The controversy on whether an optimal level of debt-equity ratio exists is beyond the purpose of this study.

ε: The error (also called noise, disturbance term, or perturbation) refers to the theoretical and, hence, non-observable stochastic (random) events that account for the differences between the observed values of the dependent variable and its theoretical value for any given model. In that model, the error term and its theoretical values cannot be computed because both are among the unknown, unobservable population parameters.

As is the case in Equation 14, what statisticians do, though, is to find the best estimators of the model parameters using sample data from an unknown population. In the sample data, there must be a difference between the observed values and those estimated by the model—this difference is called the residuals. Thus, there is an inverse relationship between the value of the residual and true values of the estimated unknown population parameters. The larger the residual, the more the chances that the sample estimators fail to capture the true but unknown population parameters; this could be for many reasons, including, but not limited to, omitted variables in Equation 14.

Hypothesis 1 involves a statistical test of the null hypothesis in that there is no relationship (influence) between LGS and CR, controlling for COLL and LEV. Here, attention must focus on the population parameter labeled. It follows that if the slope (coefficient) on that sample estimate is large enough to be statistically significant at the 5% level or less, then the null hypothesis is not upheld and the alternative hypothesis is instead upheld.

Finally, in testing Hypothesis 1, the control variables were first entered in the estimation process. Entering the control variables (COLL and LEV) first in the statistical estimation process ensured that their effects on the variance of the dependent variable (CR) are statistically purged out. This way, the influence on the dependent variable is purged out prior to estimating the effect of the independent variable on the dependent variable (Field, 2013). However, the coefficients of the control variables, as well as their statistical significances, are presented in Chapter 4.

Hypothesis 2 tests the null hypothesis in that there is no relationship (influence) between COLL and CR. In the framework of Equation 14, this statistical test hinges on the statistical significance (or not) of the sample estimate of β_2 in Equation 14. Specifically, if β_2 is statistically significant at conventional levels (≤ 0.05), then the null hypothesis—COLL has no influence on CR—is not upheld and the alternative hypothesis is instead upheld. By supporting the alternative hypothesis, it implies that COLL has influence on CR.

Hypothesis 3 calls for a test of the null hypothesis in that there is no relationship (influence) between LEV and CR. This statistical test revolves around the statistical significance (or otherwise) of the sample estimate of β_3 on the framework of Equation 14. Specifically, if β_3 is statistically significant at conventional levels (≤ 0.05), then the null hypothesis—LEV has no influence on CR—is not upheld and the alternative hypothesis is instead upheld. By upholding the alternative hypothesis, empirical evidence would exist suggesting that LEV has influence on CR.

Finally, the preceding discussions are the criteria to be met for retaining or not retaining the null hypotheses for this study.

Threats to Validity

External Validity

With respect to the external validity of the study, special attention is paid to the potential problems of sample selection bias as a major threat to external validity. Specifically, sample selection bias occurs when the sample being studied does not represent the population that the researcher wants to make generalizations

(extrapolations) off. To be exact, if selection bias occurs, it is difficult, if not impossible, to argue that the results of the study can be generalized to the wider population from where the sample was drawn (Babbie, 2010; Bagozzi, 1980; Bagozzi et al., 1991).

This study guided against sample selection bias by making sure that the sample was drawn from a random sample of small business firms that were credit rationed in Florida, using the sampling procedure discussed in this chapter.

Internal Validity

The empirical literature is clear that the concept of internal validity is relevant only to studies premised to investigate cause-and-effect relationships (Churchill, 1979; O'Leary-Kelly & Vokurka, 1998). Because the present study was not concerned with cause-and-effect relationships, internal validity was not relevant to this study. To reiterate, the present study aimed to investigate the following three questions: (a) How much of the variation in the dependent variable (CR) can be explained by the independent variable (LGS), controlling for the influence of COLL and LEV; (b) Is the relationship between COLL and CR zero; and (c) Is the relationship between LEV and CR zero?

Construct Validity

Construct validity has been defined as an attempting at "representing the correspondence between a construct (conceptual definition of a variable) and the operational procedure to measure or manipulate that construct" (Schwab, 1980, p. 5). By this definition, construct validity indices are many and depend on which apply to the study at hand. However, this study was based only on archival data. As such, no

instrument was developed or borrowed to operationalize any construct. Hence, construct validation is beyond the objective of this study to be premised on archival databases.

Ethical Procedures

Ethical consideration in research is a critical issue involving data collection in natural settings where human participation may raise ethical issues related to human subjects in research (Manita et al., 2011). However, in the present study, there were no data collection issues regarding personal human subjects. That said, this study adhered to every ethical standard stipulated by Walden University. For example, in gathering archival data for this study, the legal names and identities of the small businesses and their owners were not disclosed to any third party to guide against legal ramifications. There was strict confidentiality and anonymity of the data extracted from the archival databases.

Summary

To summarize, this study was a response to suggestions to fill research gaps in the current literature on CR. Specifically, this study was premised to quantitatively investigate the question: How much of the variation in the dependent variable (CR) can be explained by the independent variable (LGS), controlling for the influence of COLL and LEV?

To attain this purpose, the study used archival data on small businesses in Florida that were credit rationed in 2015. The major sections of this chapter included the research design, the rationale in support of the design, the research methodology, population,

sampling frame, and the procedure to extract the archival data to be used for data analysis.

Chapter 4: Data Collection and Results

Introduction

The purpose of this archival data, regression-based study was to quantitatively test the influence of loan guarantee scheme (LGS) on credit rationing (CR). In pursuit of this purpose, the archival data set for this empirical investigation was drawn from small businesses that have been credit rationed in Florida in 2015. Furthermore, the Stiglitz and Weiss (1981) seminal theory of CR was used as the theoretical platform for the study. With the theory dubbed as "the workhorse Stiglitz-Weiss model of credit rationing" (Agur, 2012, p. 220), there are scholarly supports to use Stiglitz-Weiss theory of credit rationing for the present study (Agur, 2012; Mason, 2014).

According to Stiglitz and Weiss (1981), lenders (typically banks) fail to extend the full amount of credit that would reflect the correct assessment of information available at the time the credit contract was consummated. In other words, CR occurs when banks deny a loan to borrowers who have the same characteristics as those that receive the loan. In this sense, a small business loan borrower is said to be credit rationed if the demand for a loan is greater than the amount of a loan the small business received from the bank. Thus, the gap between the amount of loan requested and received by the small business borrower is typically operationalized as CR (Drakos & Giannakopoulos, 2011; Mason, 2014; Stiglitz & Weiss, 1981).

With this operationalization in mind, this chapter is organized as follows. Following the introduction to the chapter, research questions and hypotheses are defined. Data collection strategies for the study are then presented. Following this, study results

are examined in line with the research questions and hypotheses. Next, the assumptions underlining the use of all types of multiple regression analysis are discussed. Finally, a summary concludes the chapter.

Research Questions and Hypotheses

The hypotheses for Research Questions 1, 2, and 3 and their acceptance/rejection criteria were fully discussed in proposition terms in Chapter 3. In Chapter 4, these hypotheses and their acceptance/rejection criteria are presented in terms denoting that statistical estimations have been performed.

For the present study, the following three research questions and hypotheses were investigated.

Research Question 1

RQ_1: Is there any relationship (influence) of loan guarantee scheme (LGS) on credit rationing (CR)?

Null Hypothesis 1

$H0_1$: There is no relationship (influence) of LGS on CR.

The criteria used to reject or accept this null hypothesis were as follows. Keeping in mind that a linear relationship was assumed between the dependent variable (CR) and all the other variables in the study (LGS, COLL, and LEV), then, where the pattern of partial derivatives (shown below) existed between CR and LGS, the null hypothesis would have been rejected.

$$\frac{\partial \text{CR}}{\partial \text{LGS}} = 0 \tag{15}$$

Once the null hypothesis was rejected, then the alternative hypothesis (presented below) was accepted.

Alternative Hypothesis 1

H_1: There is a relationship (influence) of LGS on CR, controlling for COLL and LEV.

Surely, once the pattern of partial derivatives (shown below) was found to exist between CR and LGS, the alternative hypothesis would have been accepted:

$$\frac{\partial \text{CR}}{\partial \text{LGS}} > 0 \tag{16}$$

Research Question 2

RQ_2: Is there any relationship (influence) of collateral (COLL) on credit rationing (CR)?

Null Hypothesis 2

$H0_2$: There is no relationship (influence) of COLL on CR.

Thus, the acceptance/rejection of this null hypothesis was that, where the relationship between CR and COLL followed the pattern of partial derivatives (shown below), this null hypothesis would have been rejected:

$$\frac{\partial \text{CR}}{\partial \text{COLL}} = 0 \tag{17}$$

Understandably, once the null hypothesis was rejected, then the alternative hypothesis was accepted.

Alternative Hypothesis 2

H_2: There is a relationship (influence) of COLL on CR.

Once the pattern of partial derivatives (shown below) was found to exist between CR and COLL, this alternative hypothesis would have been accepted:

$$\frac{\partial \text{CR}}{\partial \text{COLL}} > 0 \tag{18}$$

Research Question 3

RQ_3: Is there any relationship (influence) of leverage (LEV) on credit rationing (CR)?

Null Hypothesis 3

$H0_3$: There is no relationship (influence) of LEV on CR. Accordingly, the acceptance/rejection of this null hypothesis was that, where the relationship between LEV and CR followed the pattern of partial derivatives (shown below), this null hypothesis would have been rejected:

$$\frac{\partial \text{CR}}{\partial \text{LEV}} = 0 \tag{19}$$

Alternative Hypothesis 3

H_3: There is a relationship (influence) of LEV on CR. Clearly, once the pattern of partial derivatives (shown below) was found to exist between LEV and CR, this alternative hypothesis would have been accepted:

$$\frac{\partial \text{CR}}{\partial \text{LEV}} > 0 \tag{20}$$

Data Collection

The following sequential steps were used to gather the archival data for the present study. The first step was ensuring that IRB approval was obtained for this dissertation. In the second step, I followed a sampling procedure discussed in a recent peer-reviewed article by Kirschenmann (2016) that focused on small businesses that were credit rationed. In line with Kirschenmann's article, a search was conducted using archival data to identify the sampling frame for small businesses that were credit rationed in Florida in 2015. This effort resulted in the identification of two sampling frames: (1) The National Survey of Small Business Finances (NSSBF) by the Federal Reserve Bank (the FED) and (2) the Small Business Administration (SBA) databases.

The National Survey of Small Business Finances (NSSBF)

It is public knowledge that the FED conducts its NSSBF every interval of five years (Mills & McCarthy, 2014; Park & Coleman, 2009). Of American's 2.7 million small businesses, smallest firms were hit harder than large firms with regards to the employees affected during the financial crisis. The disparity of small firms employees' job decline was 14.1 percent in the employment fewer than 50 employees, compared to 9.5 percent in establishment with 50 to 500 employees (Mills & McCarthy, 2014). Additionally, in using this database, Park and Coleman (2009) identified in their comment that the NSSBF " is the largest and most comprehensive data set of its type representing a national sample of firms stratified by geographic region, industry sector, gender and race" (p. 257–8).

Likewise, Mills and McCarthy (2014) recently commented on the richness of information in the NSSBF database, declaring that "one of the best pictures we have of sources and uses of credit by small businesses is the Federal Reserve's National Survey of Small Business Finances, which, while dated as of 2003, indicates that about 60 percent of small businesses use term loans to finance their operations" (p. 18). Evidently, "the best pictures" in the NSSBF database relate to the following data on firm characteristics, including, but not limited to, firm size, firm age, profitability, metropolitan statistical area (MSA), industry type, sales, assets, and more (Park & Coleman, 2009). Overall, the NSSBF databases appear to have the information on the variables to be operationalized for this study. However, in the highly unlikely event that the variables of the present study are not available in the NSSBF databases, the same data pertinent to the present study were then extracted from the SBA databases. Surely, in designing the present study, months of literature and database searches revealed that NSSBF and SBA databases store archival data pertinent to the present study, as confirmed by other scholars (e.g., Mills & McCarthy, 2014; Park & Coleman, 2009).

The Small Business Administration (SBA) Databases

Many SBA databases have rich firm-level pieces of information that are relevant to the purpose of the present study. The SBA does not directly give loans to small businesses but guarantees the loans given to small businesses by lenders. For example, the SBA has a database for the 7(a) programs. This database has the following data relevant to the present study: (1) the name of the small business getting the loan, (2) the physical address of the small business getting the loan, (3) the bank lending the money,

(4) the amount loaned, (5) the interest rate paid as cost of capital, and other data for the present study. With a fee, these data are available at many places such as www.whodoessbaloans.com. Beyond this source, SBA officers are willing to assist students who need help with data for purely academic purposes. For example, the office of Mr. Miguel Gonzalez [(305) 536-5521, ext. 141] at Miami, Florida gives assistance to students who may need such data.

Furthermore, the South Florida Small Business Resource Guide (the Guide) contains information on active SBA lenders to small businesses, including rich information on loans applied for and loans received by small businesses in Florida. In addition, and most importantly, the SBA's 7(a) program provides loans to small business owners unable to obtain loans to finance their businesses through the traditional sources of financing. The 7(a) program operates through private sector lenders who provide the loans to needy small business owners so that the SBA guarantees these loans. This program has rich information pertaining to data on the following: (1) the business getting the loan, (2) address of the business, (3) industry codes of the bank lending the money, (4) the amount applied, (5) the amount received, (6) the interest rate paid, and so on. The data in this source spanned from the 1950s to September 2016.

Consequently, following Kirschenmann (2016), a search revealed that the following SBA database link (https://www.sba.gov/content/sba-7a-504-loan-data-reports) contained data on small business lender banks which, in turn, possessed the firm-level balance sheet information adequate for the purposes of the present study. Notably, a full discussion of this SBA link and why it was deemed relevant to the

dissertation were presented in Chapter 3.

Briefly, this SBA link served three purposes. First, it explicitly indicated that the SBA 7(a) program is the best and most popular SBA small business program capable of providing the sampling frame for the data requirements of the present dissertation. Second (and related to the first reason), this link afforded detailed data on small business lender banks in Florida in 2015. Third and finally, I established contact with these lender bankers and explained the purpose of the study to them, as was done in (Kirschenman, 2016).

Specifically, these lender banks were asked to assist me with their databases containing information on small business loan applications submitted to their banks, so that I would extract the necessary balance sheet data necessary for this dissertation (compare to Kirschenman, 2016). I explained to them that I am an American citizen doing a doctoral dissertation in finance. Almost all of these requests were denied because these lender banks were fearful of the legal implications of releasing customer information to a third party.

After lengthy discussions, whereby similar academic studies on small business credit rationing were sent to these lender banks, two lender banks agreed to release the data but conditional to the following binding anonymity stipulations. First, the data should be used only for academic dissertation purposes, not for commercial use at all. Second, under no circumstances should the name of the bank and the data set be released to any party other than the student conducting the study, for fear of data leakages. Third, the names of the small businesses should not be mentioned in the study—only statistical

numbers should be used to identify each small business in the sample. Fourth, a violation of any or all of these anonymity conditions breaches the bank's social ties with the person who assisted me to convince the bankers to release the data to me. Finally, of these two lender banks, one bank appeared to have a larger database from where the balance sheet data sets for this dissertation were collected. Therefore, following Kirschenmann (2016, p. 71), this lender bank henceforth is called "the bank."

Sample Selection Criteria

The criteria for including specific small business firms into the study sample were the firm must have complete information for 2015 on the following variables:

(1) Credit rationing (CR): measured by credit extended/credit requested

(2) Loan guarantee scheme (LGS): a binary variable, yes or no

(3) Collateral (COLL): a binary variable, yes or no

(4) Leverage (LEV): measured by total debt/total equity

By these criteria, the database had 1,072 small business firms in Florida for 2015.

To ensure a robust sample was drawn from this population, sample size computation was performed using G*Power software 4.0 (Faul et al., 2009). Thus, sample size calculation is shown in Table 8:

Table 8

*Sample Size Computation Results Using G*Power 4.0*

F-test—linear multiple regression: fixed model, R^2			
Analysis: a priori, compute required sample size			
Input parameters		Output parameters	
Effect size	0.08	Non-centrality parameter	17.5200000
A err prob.	0.05	Critical F	2.2829
Power (1 – err prob.)	0.95	Numerator df	3

Number of tested predictors	3	Denominator df	215
Total number of predictors	3	Total sample size	219
		Actual power	0.9504025

As seen in Table 8, the left-hand side (LHS) pieces of information inputted into G*Power yielded the calculated data on the right-hand side (RHS). In summary, as seen on the RHS, the total sample size required is 219 with an actual power of 0.9504025. Clearly, a robust sample size of 240 for this study is far greater than the sample size of 219 suggested by G*Power's sample computation.

Study Results

Descriptive Statistics

As discussed in Chapter 3, the data collection techniques used in the present study followed techniques used in a recent empirical study on small business CR. As can be observed in Table 9, the descriptive statistics of the study variables have been presented to include the entire range of all variables in the study: the dependent variable (CR), the independent variable (LGS), and the two control variables (COLL and LEV). Because the operationalization or the measurement strategy of each variable in the study is presented in Table 9, future researchers may reconstruct the entire data set of the study, as stated in the University's doctoral research students' guidelines. For example, COLL and LEV were measured as binary variables whereby the minimum and maximum values equal 0 and 1, respectively. Conversely, the dependent variable (CR) should be methodologically operationalized as an interval or ratio variable so that it be used for multiple regression analysis. Therefore, CR was measured as the ratio of the granted loan amount to the requested loan amount. This measurement strategy follows Kirschenmann (2016).

Table 9

Variable Definitions and Summary Statistics

Variable	N	Minimum	Maximum	Mean	Std. deviation
CR	240	34.00	65.00	47.99	8.25
LGS	240	0.00	1.00	0.400	0.49
COLL	240	0.00	1.00	0.266	0.44
LEV	240	1.47	5.18	3.41	0.96

Note. CR = credit rationing; LGS = loan guarantee scheme; COLL= loan collateral; LEV = loan leverage.

Research Questions and Results

Research Question 1 and Hypothesis 1

Research Question 1 was about the relationship (influence) of LGS on CR. Research Question 1 and Hypothesis 1 were examined in the framework of Equation 14 (renumbered to Equation 21). To enhance the readability of this chapter, Equation 21 is repositioned below, allowing a sharper focus on how the statistical tests were performed as well as explanations of each term in the equation. Hence, Equation 21:

$$\boldsymbol{CR = \beta_0 + \beta_1 LGS + \beta_2 COLL + \beta_3 LEV + \varepsilon} \quad (21)$$

Where,

CR = Credit rationing

LGS = Loan guarantee scheme

COLL = Loan collateral

LEV = Loan leverage

ε = Error term

A two-step sequential hierarchical multiple regression analysis was performed to answer Research Question 1 and test Hypothesis 1 in the framework of the SPSS

statistical software program. Understandably, the two-step analysis involved two models, Model 1 and Model 2 (as shown in Tables 10–12). Additionally, Model 1 and Model 2 are similarly dubbed in the literature as "block 1 and block 2," respectively (Fields, 2013; Hayes, 2013). This clarification was necessary to obviate any confusion in statistical jargons.

Importantly, it is noteworthy to underscore that Research Question 1 and Hypothesis 1 are stated as conditional statements. In line with this conditional requirement, it was inevitable that the influence of the control variables (COLL and LEV) be controlled while simultaneously estimating the influence of the independent variable (LGS) on the dependent variable (CR). For this reason, two separate but interlinked models were needed (Field, 2013), which explains why the two models were conducted in the estimation process for the present study. First, with the nature of the research question in mind, the predictive effects of the independent variable (LGS) were estimated along with the two control variables (COLL and LEV) being statistically controlled by estimating their effects first.

Second, the standard manner in which SPSS performs this form of multiple regression analysis has been variously called hierarchical multiple regression analysis (HMRA) or sequential multiple regression analysis (SMRA). Either way, it entails splitting the estimation process into two separate yet interrelated models (Field, 2013).

Empirical Findings for Research Question 1 and Hypothesis 1

The following sections report the estimated empirical findings with regard to each of the research questions and related hypotheses.

T-Statistics on LGS

In the framework of a two-step HMRA, empirical evidence (presented in Table 10) suggested strong evidence for Hypothesis 1. Specifically, this test focused attention on the *t* ratio associated with the independent variable (LGS). In Table 10, the value of the *t* statistics was highly statistically significant ($p < .001$), at the conventional levels of empirical statistical tests.

Therefore, the null of Hypothesis 1 was rejected. Put differently, there was a relationship (influence) between LGS (independent variable) on CR (dependent variable), controlling for COLL and LEV as the control variables. To underscore this finding, it is critical to emphasize that Research Question 1 and Hypothesis 1 is the key research objective of the present study as it focused on whether or not LGS was a statistically significant predictor of CR, contingent on controlling the two control variables, loan COLL and LEV. Therefore, this particular empirical result was the crucial primary finding of the present study. Next, complementary support for the empirical result, based on the *t* statistics on the independent variable (LGS) as a statistically significant predictor of the dependent variable (CR), was on R-square change statistics.

Table 10

Multiple Regression Results of Collateral, Leverage, and Loan Guarantee on Credit Rationing

	Unstandardized Coefficients (B)	Std. error	Standardized Coefficients	T	Sig.	Collinearity stat. Tolerance	VIF
Model 1							
Constant	51.9	1.94	.	26.7	.000		
COLL	2.2	1.2	0.1	1.8	.06	.96	1.0

LEV	.96	.58	.11	1.7	.96	.96	1.0
Model 2							
Constant	52.6	1.6	.	32.7	.000		
COLL	9.1	1.2	.48	7.5	.000	.67	1.4
LEV	.65	.48	.07	1.3	.17	.86	1.1
LGS	11.2	1.0	.67	10.4	.000	.67	1.4

Note. Dependent variable = CR; LGS = loan guarantee scheme; COLL = loan collateral; LEV = loan leverage; VIF = variance inflation factor.

R-square Change Empirical Test of Research Question 1 and Hypothesis 1

ANOVA Table

There is complementary empirical evidence in support of the statistical significance of the independent variable (LGS) as a statistically significant predictor of the dependent variable (CR) in the ANOVA table (Table 11).

Table 11

ANOVA Table of Collateral, Leverage, and Loan Guarantee on Credit Rationing

		Sum of squares	Df	Mean square	F	Significance
Model 1	Regression	536.08	2	268.04	4.03	0.01
	Residual	15746	237	66.44		
	Total	16282.95	239			
Model 2	Regression	5515.11	3	1838.37	40.29	0.00
	Residual	10767.84	236	45.62		
	Total	16282.95	239			

Note. Model 1: Dependent variable = credit rationing (CR); Predictors: leverage (LEV) and collateral (COLL). Model 2: Dependent variable = credit rationing (CR); Predictors: leverage (LEV), collateral (COLL), and loan guarantee scheme (LGS).

Thus, the information from the ANOVA table focused on investigating whether the regression model embedded in the ANOVA table was better at predicting the dependent variable (CR) than using the mean as a “best guess” for predicting the dependent variable (CR) (compared to Field, 2013). To be more specific, the F-ratio was

computed to compare the statistical improvement in the prediction of the dependent variable by fitting the regression equation, against the prediction of the same dependent variable, by using “noise” (labeled Residual) in the table (compared to Field, 2013).

The ANOVA framework was split into two parts. Because the improvement in predicting the dependent variable using the ANOVA regression was far greater than the noise (residuals) within the model, the value of the F-statistics was far greater than 2. As such, SPSS computed the exact probability of obtaining such F-statistics solely by chance. Keeping in mind that the initial model (Model 1) had only two control variables (COLL and LEV), the F-ratio was 4.03, and this value was extremely unlikely to have occurred by chance ($p < 0.01$). On the other hand, the addition of the independent variable (LGS) in the second model (Model 2) yielded an F-ratio of 40.29. As can be observed in Table 11, this final model significantly improved the prediction of CR ($p < 0.001$). This improvement was ascribed to the inclusion of the independent variable (LGS) in the model. In conclusion, using empirical evidence from three slightly different yet interrelated statistical procedures (HMRA, R-square change, and ANOVA), the present study has demonstrated quantitative evidence suggesting that the independent variable (LGS) was a statistically significant predictor of the dependent variable (CR) for the present study. Research Question 2 and Hypothesis 2 are presented next.

Research Question 2 and Hypothesis 2

The premise of Research Question 2 was if there was any relationship (influence) of COLL on CR. Hypothesis 2 was examined by focusing attention on the *t* ratio

associated with COLL. Because testing for the influence of COLL on CR entailed a direct predictive effect test, the focus was on Table 10 Model 1. The *t* ratio associated with COLL in Model 1 is not statistically significant ($p > .05$). Therefore, the null hypothesis of Hypothesis 1 was accepted. Put differently, there was no relationship (influence) of loan COLL on CR.

To avoid confusion, the information in models 1 and 2 in Table 10 need clarification. Research Question 1 and Hypothesis 1 required empirical testing of the direct effect (influence) of COLL on CR, focusing on the *t* ratio associated with COLL in in Model 1, not Model 2, of Table 10. The reason is Model 2 involved a combination of influence from other variables, which may mislead one to infer that COLL was statistically significant. That is, the statistical significance on COLL in Model 2 was high ($p < 0.001$). However, this high statistical significance was contributed by LEV and LGS. Therefore, to isolate precisely the level of statistical significance attributable solely to COLL, the focus should be on the *t* statistics of COLL in Model 1, where it was insignificant at conventional levels ($p > .05$). Finally, the empirical evidence in Model 1 suggested that there was no relationship (influence) of loan COLL on CR. The results of Research Question 3 and Hypothesis 3 are discussed next.

Research Question 3 and Hypothesis 3

The basis of Research Question 3 was if there was any relationship (influence) of LEV on CR? Hypothesis 3 was examined by focusing attention on the *t* ratio associated with LEV. Because testing for the influence of LEV on CR meant a direct test of the predictive effect of LEV on CR, the focus was on Model 1 of Table 10. As can be clearly

observed, the *t* ratio associated with LEV in Model 1 was not statistically significant ($p > .05$). Therefore, the null hypothesis of Hypothesis 1 was accepted, and there was no relationship (influence) of loan LEV on CR.

Overall, the primary substantive empirical investigation of this study concentrated on the degree of variance in small business CR explained by LGS. Evidence from Table 12 strongly suggests that LGS explained 30.6% of the variance in CR, and this contribution was highly statistically significant ($p < 0.001$).

The r-square change in Table 12 was highly statistically significant at conventional levels ($p < 0.001$). Even though the empirical evidence in Table 12 is self-explanatory (as the typical SPSS r-square change result), a breakdown is presented of the findings to make things clearer and to avoid any confusion.

Table 12

SPSS Model Summary: Multiple Regression Results of Collateral, Leverage, and Loan Guarantee on Credit Rationing

Model	R	R-square	Adjusted R-square	Std. error of estimate
1	0.181	0.033	0.025	8.15
2	0.58	0.339	0.330	6.75

Change statistics

Model	R-square change	F-change	Df1	Df2	Sig. F-change
1	0.033	4.03	2	237	0.019
2	0.306	109.13	1	236	0.000

Durbin–Watson = 2.010

Note. Dependent variable = credit rationing (CR); Model 1 predictor variables =

constants— COLL and LEV; Model 2 predictor variables = constants—COLL, LEV, and LGS.

On entering the two control variables of the study (COLL and LEV) in the SPSS estimation process, the r-square change in Model 1 was 0.033. This r-square change was statistically significant ($p < 0.05$). However, when the independent variable (LGS) of the study was entered into the estimation process, the r-square change jumped from 0.033 to 0.306, and this 0.306 in r-square change was statistically significant ($p < 0.00$). That is, even though the r-square change of 0.306 was solely attributed to the independent variable (LGS), the significance level was reported under "Sig. F-Change" because the other variables were still in the estimation process. This warranted the use of F-statistics to inform that the contribution of LGS appearing over the r-square change was attributed to the two control variables (COLL and LEV) in the models. In conclusion, these two pieces of empirical evidence were of strong statistical support, indicating that LGS was a predictor of CR. This result was an encouraging empirical finding of the study because it appears to be the overall takeaway a reader of this study should have. A discussion of the assumption of multiple regression analysis is presented next.

Assumptions of Multiple Regression Analysis

Influential Outliers

The data set was examined for the presence of any influential outliers. No influential outliers were found among the values of the variables in the regression analysis for the dependent variable (CR) and the independent variable (LGS), as well as the two control variables (COLL and LEV).

Normality of Residuals

It has been well documented in the literature that only the observed residual (not the unobserved errors) should be examined to assure that it is normally distributed (Field, 2013; Francis, 2013). In line with this notion, I used SPSS to examine the extent of normality of the residuals in the present study. Specifically, normality was evaluated in the framework of a P-P plot of standardized residuals as well as a histogram (Francis, 2013; Field, 2013). These results are presented in Figures 3 and 4.

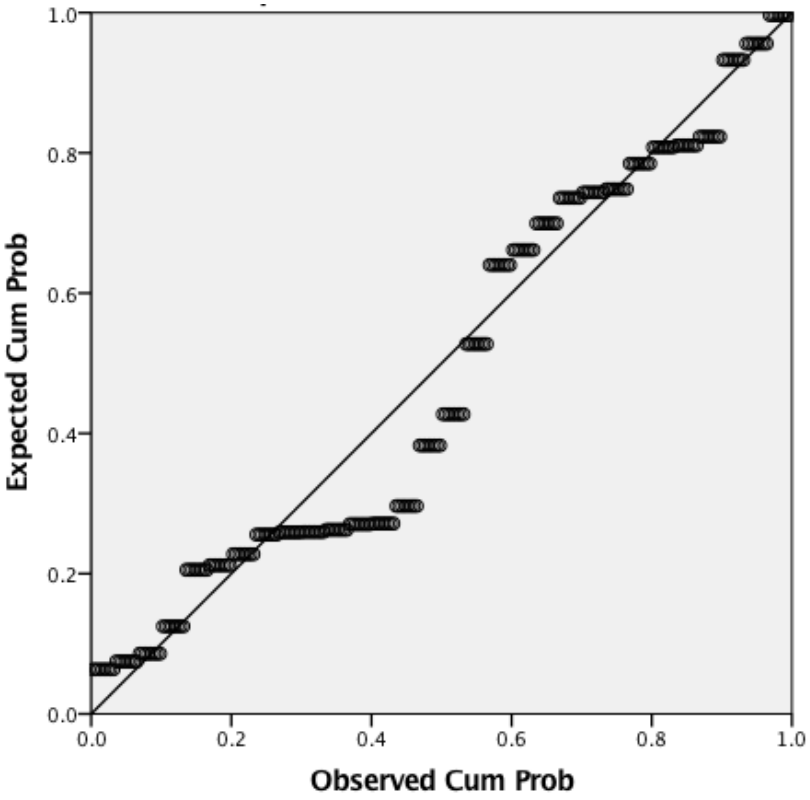

*Figure 3.*Normal P-P plot of regression standardized residual of the dependent variable (CR).

Similarly, the histogram of the dependent variable (CR) is shown in Figure 4.

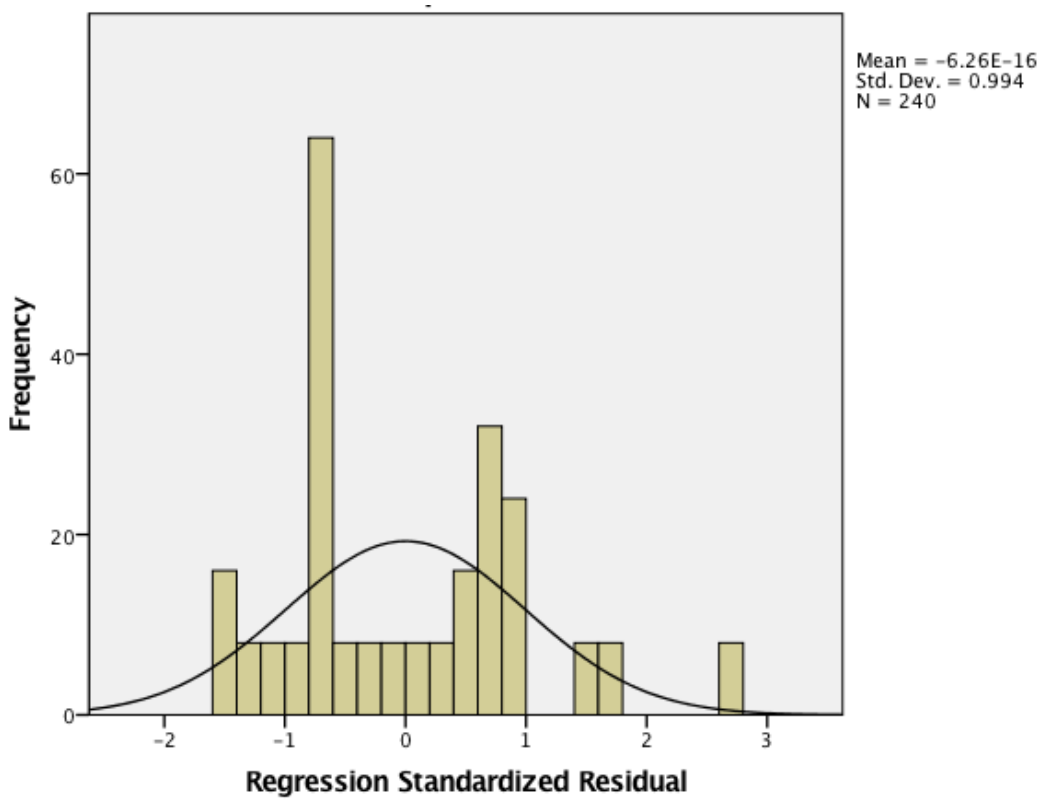

Figure 4. Histogram of the dependent variable (CR).

It is encouraging to observe that the P-P plot and accompanying histogram appear to suggest no serious departure from normality. That is, the degree of non-normality was not serious enough to cast doubt on the regression coefficients shown, especially in the multiple regression estimations. Second, because multiple regression is robust to a fairly large sample size, as used in the present study, confidence in the results of the study is enhanced (Lin et al., 2013). Furthermore, even though the slight violation of normality was not considered serious enough to undermine the regression results, an attempt was made to transform the data (Field, 2013). That is, log and square root transformations commonly used in the literature (Francis, 2013) failed to radically improve the results of the estimation. At this juncture, I was encouraged by George Box's (1976) statement:

> …the statistician knows…that in nature there never was a normal distribution, there never was a straight line, yet with normal and linear assumptions, known to be false, he can often derive results which match, to a useful approximation, those found in the real world. (pp. 791–9)

Multicollinearity

On checking for multicollinearity, the present study found evidence that multicollinearity was absent as confirmed by (1) the examination of bivariate correlations and scatterplots between each pair of the independent variables and (2) the SPSS output on the variance inflation factor (VIF; shown in Table 10). Both the tolerance and VIF tests were within the acceptable range (Field, 2005).

With respect to the acceptable range of VIF and tolerance, experts suggested that if the largest VIF is greater than 10, this indicated that multicollinearity is a problem in the study (Field, 2013). The largest VIF value in the study was 1.4 (Table 10). Similarly, experts suggest that a tolerance below 0.1 indicates that there is a concern for multicollinearity in the study (Field, 2013). In the present study, the tolerance is 0.71 corresponding to the reciprocal of the VIF of 1.4 (Field, 2013). Technically, the VIF for the two models in Table 10 can be computed as follows:

VIF for Model 1 $VIF = 1 / (1 - R^2)$ (22)

$= 1 - 0.033$

$= 1.034$

VIF for Model 2 $VIF = 1 / (1 - R^2)$ (23)

$= 1 - 0.339$

$= 1.51$

As can be seen, these two VIF statistics for Model 1 and Model 2 closely approximate the VIF statistics reported in Table 10.

Homoscedasticity–Equality of Variance

The assumption of homoscedasticity states in using the independent variable to predict the variance in the dependent variable, and that the residuals from the prediction should be of equal size across all values of the independent variables. When this situation holds, a scatterplot of the regression standardized residual on the vertical axis against the regression standardized predicted values on the horizontal axis reveals a clustering of the scatterplots values evenly without dispersing overly on the 45-degree line. When this situation is observed, there is homoscedasticity. Conversely, when the scatterplot values spread away from the 45-degree line, there is heteroscedasticity or unequal scattering (Francis, 2013; Tabachnick & Fidell, 2013).

In the present study, the assumption of homoscedasticity was checked as follows (Tabachnick & Fidell, 2013). Upon the completion of the multiple regression analysis results (reported in Table 12), scatterplots of the residual (the difference between obtained and predicted scores of the dependent variable) were diagramed. In this scatterplot, the regression standardized residual appeared on the vertical axis, and the regression standardized predicted values on the horizontal axis. A visual examination suggested that the trend of the plot centered on the 45-degree line in a fairly approximate manner.

Overall, heteroscedasticity is always a matter of degree (Field, 2013). Thus, in the present study, a visual inspection of the scatterplot (Figure 5) suggests that the null hypothesis of heteroscedasticity is rejected while the alternative hypothesis of homoscedasticity is accepted (Field, 2013; Tabachnick & Fidell, 2013).

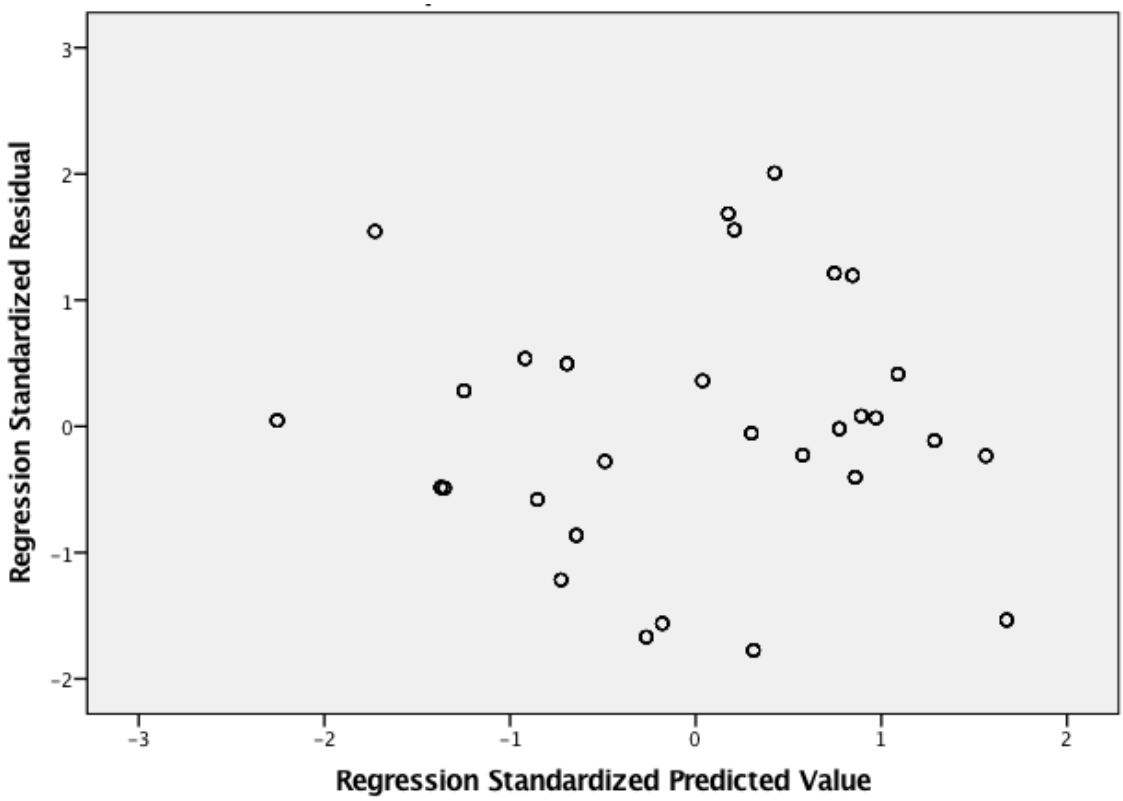

Figure 5. Scatterplot test for heteroscedasticity of the dependent variable (CR).

Heteroscedasticity Solution

Even if there is evidence of heteroscedasticity, heteroscedasticity-consistent estimators can address problems of heteroscedasticity. Specifically, weighted least squares (WLS) estimators can be used to run the multiple regression analysis. Finally, WLS statistical routine is available in SPSS.

Additionally, even if the degree of heteroscedasticity were to be severe in the present study, a variance-stabilizing transformation would have been used to address the problem by transforming the dependent variable (CR).

Linearity

The linearity assumption was checked using scatterplots of the residual of the dependent variable (CR). In this scatterplot framework, the regression standardized residual appeared on the vertical axis, and the regression standardized predicted values appeared on the horizontal axis as reported in Figure 5. As can be seen in Figure 5, most of the residual values are randomly appearing around the zero line. This is empirical evidence to reject the null hypothesis of non-linearity (Tabachnick & Fidell, 2013). However, if the relationship between the dependent variable (CR) and the independent variable is found to be non-linear, data transformation could be performed to achieve linearity (Field, 2013; Francis, 2013).

Durbin–Watson Test of Autocorrelation

The problem of autocorrelation arises mainly with time series data (Francis, 2013). As can be seen in Table 12, the computed Durbin–Watson coefficient was 2.0. Specifically, this test checks whether there was a serial correlation between errors in the regression model. Technically, it tested whether adjacent residuals (observed residuals) were correlated as a way to ascertain whether the unobserved errors have a mutual relationship. This process is testing the assumption of independent errors.

Importantly, the statistics of the Durbin–Watson test lie in the range of zero to four (0–4). A value of 2 suggests that the residuals were uncorrelated, a value greater

than 2 informs adjacent residuals were negatively correlated, and a value below 2 indicates that adjacent residuals were positively correlated. As can be observed in Table 12, the value of adjacent residuals for the present study was 2.010. Therefore, this empirical evidence suggests that there was no evidence of autocorrelation dictated in the data set for the present study.

Summary

This study examined three key research questions. The premise of Research Question 1 was if there was a relationship (influence) of LGS on CR, controlling for COLL and LEV? Empirical evidence was found in support of this research question. The argument of Research Question 2 was if there was a relationship (influence) of COLL on CR. Empirical evidence was found suggesting that there was no influence of loan COLL on CR. However, when COLL and LEV were jointly examined for their influence on CR, statistically strong empirical evidence was found suggesting COLL and LEV together had an influence on CR as shown in Model 1 of Table 12 ($p < .05$). However, it must be mentioned that a test of the combined effect of COLL and LEV was not part of the purpose of the present study. On that note, the conclusion that COLL has no influence on CR was upheld for this study.

Finally, the investigation of the hypothesized relationship (influence) of leverage (LEV) on credit rationing (CR) was the focus of Research Question 3. To that end, there was no empirical evidence found suggesting that LEV had a relationship (influence) on CR. However, it must be mentioned that a mutual influence of LEV and COLL was found in this study, but that was never identified as one of the purposes of the study.

Understandably, the preceding empirical evidence in this chapter informed a discussion, conclusions, and recommendations for Chapter 5 of this study. That is, the findings of this study provided the content that informed the presentations in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Since three decades ago, credit rationing has occupied the center stage of academic debates across the globe, and this trend is not abating (Mason, 2014). The purpose of this study was to use small business data sets from Florida in 2015 to quantitatively test the influence of loan guarantee scheme (LGS) on credit rationing (CR), controlling for the effects of loan collateral (COLL) and loan leverage (LEV). Stiglitz and Weiss (1981) seminal theory of credit rationing was the theoretical framework for the study. Evidently, their theory of credit rationing has been dubbed "the workhorse Stiglitz-Weiss model of credit rationing" (Agur, 2012, p. 220). Therefore, the Stiglitz-Weiss model was the appropriate theoretical framework for this study. Thus, the study empirically investigated the nature of the theorized linkages between four key variables in the empirical literature on credit rationing:

(1) Small business credit rationing,

(2) Small business participation in loan guarantee scheme,

(3) Small business loan collateral, and

(4) Small business loan leverage.

To be more specific about the framework of the Stiglitz-Weiss model, the present study investigated whether the independent variable (LGS) would explain variations in the dependent variable (CR), controlling for the confounding effects of two control variables (loan COLL and LEV).

A literature search revealed a gap in the current literature on small business credit rationing—specifically on examining whether loan guarantee scheme was a major contributor in explaining the variance in small business credit rationing, controlling for the confounding effects of loan collateral and leverage. Thus, this was the major research gap the study attempted to fill.

Interpretation of Findings

Using the conceptual lens of the Stiglitz-Weiss model, the major purpose of the present study was pivoted on one key empirical question: Holding the effects of loan collateral and leverage constant (i.e., controlling for them), would small business participation in federal government-sponsored loan guarantee scheme explain or predict small business credit rationing?

Overall, the study found empirical evidence in support of the question. Small business participation in loan guarantee had a relationship (influence) on credit rationing when the confounding effects of collateral and leverage were statistically controlled, which is in line with Research Question 1.

With this background discussion in mind, a discussion of key findings of this study is now presented.

Key Findings and Interpretation

First, the evidence appears to be strong that small business participation in loan guarantee scheme had a relationship (influence) on credit rationing. It was notable that the primary research objective of the present study centered on Hypothesis 1. Thus, with the finding that loan guarantee scheme was a statistically significant predictor of credit

rationing, this result appears interesting and encouraging, especially given that this result was found even after controlling for the potential confounding effects of loan collateral and loan leverage.

In contrast, even though loan collateral and loan leverage were not of immediate substantive interest other than being control variables, each variable had no relationship with loan credit rationing. Evidently, these three propositions aligned with the three empirical questions examined in this study. With the preceding summary of these three findings of this study, I now shift focus to a detailed discussion of each of the three key findings.

The next question about this finding was if it corroborated (or contradicted) past and current research on small business credit rationing. A literature search failed to find past or current studies on small business credit rationing focused on investigating the central research question of the present study—is there any relationship (influence) of loan guarantee scheme on credit rationing, controlling for collateral and leverage? Therefore, to the best of my knowledge, the present study is the first study examining this research question. As the first study to investigate this particular question, this study has made a major contribution to the literature in credit rationing.

Comparison with Similar Studies

Since many past decades, it has been well established that comparing and contrasting results from a research study with those from similar studies inform the cumulative literature for theory building, and more (e.g., Churchill, 1979). Even though empirical studies have examined several research questions on small business credit

rationing, there is still a paucity of research focusing on the research questions addressed in the present study, except for Kirschenmann (2016). Because of Kirschenmann's relevance to the present study regarding the research purpose, study design, and method of data collection, the present study therefore followed Kirschenmann.

For these reasons, the results of Kirschenmann (2016) merit comparison with the results of the present study. Hence, a brief comparison is presented. Kirschenmann studied the relative differences in the degree of credit rationing among opaque and transparent small businesses over time—beginning from the time the small businesses established relationships with the banks to future periods with the banks in a longitudinal time context. Overall, this panel data study found empirical evidence suggesting credit rationing was higher for opaque rather than transparent small businesses at the beginning of their relationships with banks, but this trend decreased for opaque and transparent small businesses over time.

Additionally, Kirschenmann's (2016) study focused on problems related to information asymmetry and absence of bankers' incentives to small businesses. Her study found that these two issues were the core factors responsible for credit rationing and the changes thereof over time. However, the research objectives of the present study were not the same as those discussed in Kirschenmann, even though both studies were centered on small business credit rationing.

However, there are two critical factors common among the present study and Kirschenmann. Both studies operationalized the dependent variable (CR) in the same way, and this operationalization makes the comparison of findings more meaningful

across present studies and potential future ones. Both studies measured credit rationing as the ratio of requested to granted loan amounts, such that this ratio was an inverse measure of credit rationing (Kirschenmann, 2016). Using this inverse measure, the smaller the value, the more severe credit rationing was on the small businesses under focus and vice versa.

Another commonality between the both studies is that they used loan leverage as a control variable, among other control variables. However, there appears to be an important difference. In Kirschenmann, small business loan leverage was inversely related to the dependent variable (CR), and this result was statistically significant. Conversely, in the present study, loan leverage was positively related to credit rationing, but it was statistically insignificant.

Finally, it is well established that control variables in empirical studies have no substantive interest in and of themselves, except that the variables are confounders that should be controlled statistically so that their effects on the variance of the dependent variable are accounted for statistically.

Limitations of the Study

As with any other empirical study, the present study has limitations. In the same way, these limitations would inform future researchers to make contributions that would enhance the current knowledge on credit rationing. The present study used archival data drawn from balance sheet information submitted to lender banks. Although archival data have obvious advantages, primary data obtained directly from small businesses may offer superior, fine-grained information.

Furthermore, the present study investigated the potential role of loan guarantee scheme as the key independent variable linked to small business credit rationing, controlling for the confounding effects of loan collateral and leverage. There are other possible independent variables linked to small business credit rationing not included in the present study. For example, there are other potential determinants of credit rationing not examined in the present study because they were not considered relevant to the present study (Drakos & Giannakopoulos, 2011).

Recommendations

In line with other empirical research, it has been well established that recommendations are informed by the gaps not addressed in an empirical study (Mason, 2014). With this statement in mind, the results of the present study have suggestions for policy makers and managers involved with small business credit rationing activities.

The present study found empirical evidence in support of the link between small business participation in loan guarantee scheme and small business loan credit rationing, controlling for the confounding influence of loan collateral and leverage. With this evidence bearing in mind, policy makers and managers may now investigate deeper the nature of these linkages.

For example, small business loan managers may want to gain further understanding in how increasing small business participation in loan guarantee schemes may reduce loan credit rationing, and how other macroeconomic variables may impact this process. Researchers in the FED can further explore the implications of the results of the present study to small business loan rationing.

Implications

The core of Walden University's mission statement hinges on delivering social change to the stakeholders of the university. To attain this strategic objective, research and learning activities at Walden University have been rooted on the goal of continuous improvement in the pursuit of best practices and delivering these practices to all university stakeholders. Hence, by this strategic intent, the capstone objective of the present study centered on ensuring that the findings of this study make a positive contribution by delivering social change to societal stakeholders.

As small business loan managers and policy makers are informed of the outcome of this research, the likelihood may be higher that they are empowered to optimally allocate society's scarce and limited resources in the production of goods and services for the benefit of society, for this motivation is the bedrock of the federal government's strategy for the small business loan guarantee scheme. This way, the outcome of this study would contribute to social change by reducing negative economic consequences of small business loan credit rationing and information asymmetry.

Future Research

The present study has implications related to suggestions for future research. Of all the problems related to small business credit rationing research, lack of access to the "right" data is the main limitation. Honestly, the extensive literature review for this study led to the breakthrough in accessing the micro-level balance sheet data necessary for this study. I say this to emphasize that future research is entirely dependent on the availability of the "right" micro and macroeconomic data that research on credit rationing demands.

Although the FED and the SBA are making attempts at establishing publicly available databases useful for empirical research on credit rationing, these data sets are not in categories that would render them appropriate to address the critical research questions in small business credit rationing research at the firm-level. For example, future research can replicate the present study conditional on the availability of micro- and firm-level data. The need for replication is well established, but access to small business credit rationing data sets to accomplish this need is a herculean task.

Equally important, future research should examine other theoretically justified determinants of small business credit rationing. For example, future research can replicate the present study using data from other countries. As well, gender (male versus female small business ownership) small business credit rationing literature has consistently shown mixed results. Although sex may be an important covariate, access to primary data on each cohort (males versus females) still poses a challenge. Thus, there is a research need to explore whether males and females are credit rationed differentially in the United States and worldwide.

Conclusions

The conclusion of this study could not have been reached without a proper re-examination of the research questions and the hypotheses:

Research Question 1 asked if there was any relationship (influence) of loan guarantee scheme on credit rationing. Once the effects of the two control variables (COLL and LEV) were statistically held constant, the influence of loan guarantee scheme

on credit rationing became strong [F (3, 236) = 40.29; $p < .001$)]. Thus, loan guarantee scheme has a relationship (influence) on credit rationing.

Research Question 2 asked if there was any relationship (influence) of collateral on credit rationing. Empirical evidence suggested there was no relationship (influence) of loan collateral on credit rationing.

Research Question 3 asked if there was any relationship (influence) of leverage on credit rationing. Empirical evidence found no relationship (influence) of loan leverage on credit rationing. Finally, the public policy implications and social change ramifications of the study were presented.

Hence, the purpose of this quantitative, archival data, correlational study was to test the influence of loan guarantee scheme on credit rationing, while simultaneously controlling the effects of loan collateral and leverage. The study positioned itself on small businesses that have been credit rationed in Florida in 2015. Stiglitz and Weiss (1981) theory of credit rationing was the theoretical platform for the study. According to this theory, lenders (typically banks) fail to extend the full amount of credit that would reflect the correct assessment of information available at the time the credit contract is done (Stiglitz & Weiss, 1981). In other words, credit rationing occurs when banks deny a loan to borrowers who have the same characteristics as those that receive the loan. In this sense, a small business loan borrower is said to be credit rationed if the demand for the loan is greater than the amount of the loan the small business received. Thus, the gap between the amount of loan requested and loan received by the small business borrower

is typically operationalized as credit rationing (Drakos & Giannakopoulos, 2011; Mason, 2014; Stiglitz & Weiss, 1981), which is the criterion variable for the present study.

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