ACCESS TO CAPITAL OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE BRAZILIAN SERVICE SECTOR

A Dissertation in Hospitality Management

by

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Abstract

Small and Medium-Sized Enterprises (SMEs) in the service sector, such as hotels, are in the forefront of economic policy in Brazil, playing critical role in economic growth as they are a large source of employment and income generation. However, several obstacles prevent SMEs from expanding their activities since the lack of adequate access to capital hinders SMEs from being competitive. A possible reason for this limited access to capital may be the presence of information asymmetry between borrowers and lenders. To offset the information asymmetry between financial institutions and SMEs, the availability of lending technologies such as personal collateral, fixed-asset business lending and financial statement lending, may signal banks the availability of higher-quality projects, helping reveal risk profile of SMEs in order minimize default in loan contracts and reduce information asymmetry between SMEs and banking institutions. The purpose of this study was to investigate the impact of lending technologies on: 1) access to capital and 2) the size of loan contracts in the Brazilian credit market, broadly focusing on SMEs in the service sector, and more specifically, on the hospitality industry. More specifically, it aimed to investigate the impact of lending technologies, such as pledging personal and business fixed assets as collateral and financial statement lending on both the likelihood of obtaining bank loans and the size of loan contracts. Using data from the World Bank Enterprise Surveys, this study conducted logit and ordinary least squares (OLS) analyses to investigate the proposed research aims. The results of this study suggested that both fixed asset lending, such as business and personal collateral, and financial statement lending are important components for service and hotel SMEs to the increase of both the likelihood of access to capital and the size of loan contracts. Hotel SMEs are also more likely to obtain access to capital than other SMEs in the service sector. In addition, this study found significant evidence suggesting that larger and older SMEs are not only more likely to have access to capital, but these businesses also obtain greater loan
values. Differences in ownership type, bank and gender effects were also shown to have a significant impact on access to capital.
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Chapter 1: Introduction

Overview

Small and Medium-Sized Enterprises (SMEs) in the service sector are pivotal for economic growth in Brazil. Not only these firms represents a large proportion of firms in middle-income countries, such as Brazil, but small and medium-sized businesses also make a greater contribution to employment creation and economic growth than large businesses (Meghana Ayyagari, Beck, & Demirguc-Kunt, 2007; Meghana Ayyagari, Demirguc-Kunt, & Maksimovic, 2014). The World Bank (2015) defines middle-income countries as nations with a per capita gross national income (GNI) between $1,045 and $12,746 in 2014 US dollars. Middle-income countries depend on SMEs in the hotel industry to improve the local economy as small hotels not only as a creator of employment but also as a contributor to national growth in Gross Domestic Product (Jaafar, Abdul-Aziz, Maideen, & Mohd, 2011; Serrasqueiro & Nunes, 2014; Sharma, 2006).

However, several obstacles prevent SMEs from expanding their activities. Among them, lack of adequate access to capital hinders SMEs from increasing in size, as small and medium-sized firms are more credit constrained than their larger counterparts (Ayyagari, Demirguc-Kunt, & Maksimovic, 2008). Access to capital is a global issue that mostly affects the developing world since low and middle-income countries are usually characterized by poor legal systems and lack of property rights protection (Beck, Demirguckunt, & Maksimovic, 2008). Evidence suggests that countries with worse property right protection have lower access to finance and economic growth (R Aterido, Hallward-Driemeier, & Pages, 2011). Weak institutional infrastructure may also increase the practice of corruption (Acemoglu & Johnson, 2005), and undermine competition, investments in entrepreneurial activity and contract enforcement (Dethier, Hirn, & Straub, 2011). Kumar (2004) defines
access to capital as firms expressing a demand for external sources of finance, applying for and receiving bank loans. Access to capital also includes firms who do not apply for external finance because they can use internal funds (i.e. retained earnings) to finance their activities. A possible reason for limited access to capital may be the presence of information asymmetry between borrowers and lenders that lead to credit rationing (Stiglitz & Weiss, 1981). Information asymmetry poses the challenge of adverse selection, as financial institutions may not have the adequate tools to assess both the skills of SME owners applying for finance and the quality of the project. To offset the magnitude of information asymmetry between financial institutions and SMEs, the availability of lending technologies may signal banks higher-quality projects, and provide an incentive for small and medium-sized firms to perform according to contractual stipulations (Bester, 1987). Lending technologies refer to loan contract mechanisms that minimize information asymmetry (Berger & Udell, 2006). These lending technologies help signal risk profile of SMEs in order minimize default in loan contracts.

The purpose of this study is to investigate the impact of lending technologies on 1) access to capital and 2) the size of loan contracts in the Brazilian credit market. This study solely focuses on comparing hotel SMEs to other SMEs in the service sector since hotels are formalized businesses, whereas small foodservice establishments have a higher likelihood to be part of the informal economy (Barcelos, 2002). SMEs may be defined using either the total number of full-time employees or total annual sales volume as the main criteria. The most widely used criterion in Brazil is the number of employees, adopted by both the Brazilian Institute of Geography and Statistics (IBGE) and the Institute for the Support of Micro and Small Enterprise (SEBRAE). Table 1 provides a concise definition of SMEs in Brazil (IBGE, 2003).
The theory of financial intermediation emphasizes the intermediary’s role in collecting information about borrowers, and using the information to design loan contracts in order to solve the problem of asymmetric information (Diamond, 1984; Leland & Pyle, 1977). The theory also applies to the provision of intermediated finance in private markets to small, informationally opaque SMEs, which relates to the lack of credible financial information (Berger, Klapper, & Udell, 2001). Contract design is critical in the case of SMEs because their relationship with banking financial institutions may be characterized by high levels of information asymmetry. Loan contracts may consist of personal and business collateral requirements, financial statement lending technology, loan maturity, and restrictive covenants, among others. These elements aim to reduce asymmetric information between SMEs and banking institutions.

Collateral requirements in a lending technology are important since they act as personal or business asset guarantees in case of loan default. SMEs tend to offer collateral in order to signal high project quality (Voordeckers & Steijvers, 2006). Mechanisms other than collateral may be also used to screen out riskier projects. Financial statement lending is based primarily on the strength of a borrower’s financial statements (Berger & Udell, 2006). Transparent small and medium-sized firms that have their financial statements revised by an external auditor may provide credibility to SMEs’ financial statements by detecting questionable accounting practices and mitigating uncertainty (Sikka, 2009).

Statement of the Problem

In Brazil, SMEs in the service sector contribute to 45% of job creation in the country and 20% of GDP (La Rovere & Shehata, 2006; Melo & Neri, 2004; Zica & Martins, 2008). This indicates that services SMEs are a critical component in the national economy as a large source of employment and income generation. Hotel SMEs are an important component of
the Brazilian service sector, having recently incurred faster growth than other service small businesses (Kubota & Almeida, 2011). However, the lack of adequate access to capital is aggravated in the Brazilian credit market. Galindo and Micco (2007) found that difficulty of access to financial markets is a major obstacle to expanding business operations in Brazil and other middle-income countries in Latin America. Lack of access to capital may also contribute to the exacerbated mortality rate of small businesses in Brazil as limited access to financial services may decrease the likelihood of SME survival (Britto, Vargas, & Cassiolato, 2002).

In addition, lack of access to lending technologies constrains SMEs in the Brazilian credit market from having access to capital (Pombo & Herrero, 2001). Since small businesses are informationally opaque firms, they lack credible financial statement information. Small firms in Brazil may also show signs of credit constraint as they largely depend on internal sources of capital, such as retained earnings. SMEs that do not have access to the adequate lending technologies may incur higher levels of information asymmetry (Carvalho and Abramovay, 2004), which poses a potential problem as SMEs appear to be excluded from the credit market, constraining the ability of firm growth (La Rovere, 2001).

**Purpose of the Study**

The overall purpose of this study is to investigate the impact of lending technologies on access to capital and the size of loan contracts in the Brazilian credit market, focusing on the comparison between hotel SMEs and other small firms in the service sector. In addition, it aims to investigate the impact of lending technologies, such as pledging personal assets and fixed assets as collateral and financial statement lending on the likelihood of obtaining bank loans for SMEs in both the service and hotel sectors that participate in the Brazilian credit market. The study anticipates that better access to adequate lending technologies will increase
the likelihood of service/hotel SMEs obtaining bank loans in the Brazilian credit market. The study also anticipates that hotel SMEs will have greater access to capital than other service SMEs since hotels may have greater access to lending technologies (Jang, Tang, & Chen, 2008).

Additionally, this study aims to quantify the impact of these lending technologies on the size of loan contracts. This assessment is important because these guarantees not only may increase the likelihood of obtaining bank loans, but they may also facilitate access to better terms in loan contracts (Shockley & Thakor, 1997). SMEs with expanded access to credit markets are more likely to survive (Cressy, 2006; Frazer, 2005) and promote firm growth (Carpenter & Petersen, 2002). Access to capital is a critical component for the performance of small businesses as firms excluded from the credit market may be constrained in their ability to expand their operations and incur improvements in firm performance (Franco & Haase, 2010).

**Main Contributions of the Study**

This study contributes to the field of SME finance on several fronts. One of the main contributions of the study is to test the theory of financial intermediation, as described in the literature review, in the context of service and hotel firms in a middle-income country. The main component of this theory relates to the ability of financial intermediaries to include mechanisms in contract that will give enough information in order to assess borrowers’ risk profiles (Diamond, 1984). There is a need to depict different financing sources available for SMEs in the service sector in middle-income countries, since most studies are conducted with manufacturing firms in high-income countries (Bigsten & Gebreeyesus, 2007; Hsu & Chen, 2000; Taymaz, 2005). Unlike small firms in the manufacturing sector, on one hand, services SMEs have different challenges that impede greater participation in the credit market. One
particular challenge is the labor-intensive nature of small firms in the service sector. Because of their labor intensiveness, SMEs in the service sector may have low capital requirements. Therefore, these businesses may not have sufficient assets to offer as collateral, and banks may find it more difficult to assess project quality (Binks & Ennew, 1996; Carpenter & Petersen, 2002; Ennew & Binks, 1995).

On the other hand, small and medium-sized hotels, compared to other service SMEs, are characterized by higher levels of volatility from unstable cash-flows and demand uncertainty (Newell & Seabrook, 2006) and higher operational risk due to their capital intensity nature (Devesa & Esteban, 2011). Given demand uncertainty and operational risk, fixed assets may give lenders an additional security when issuing debt given the collateral value of these assets (Dalbor & Upneja, 2004; Upneja & Dalbor, 2001). As a result fixed assets represent valuable collateral and SME hotels may be more likely to use fixed assets to fund their operations (Wald, 1999) Therefore, this study also contributes to the existing literature by comparing access to capital between hotel SMEs and other firms in the service sector.

A managerial contribution of this study is to identify particular actions that may increase SMEs’ access to bank loans, and therefore, potentially improve firm performance. More specifically, personal and fixed assets collateral requirements and financial lending technology may be critical components for service and hotel SMEs to enter the Brazilian credit market. Information asymmetry may be minimized if SMEs have access to the aforementioned lending technologies, since the informational advantage financial intermediaries may be able to collect centers on the enterprises’ ability to signal their quality to lenders. This relates to the theoretical contribution of testing the signaling role of lending technologies. The theory of financial intermediation suggests that these lending technologies
may have a signaling role that screens out low-quality projects from high-quality ones (Bester, 1985, 1987; A. Boot, Thakor, & Udell, 1991; Chan & Kanatas, 1985; Smith, 1987).

Recent theoretical models suggest that, combined with business collateral, the signaling role of personal collateral, where the lender has the right of access to assets other than the firm’s assets (i.e. personal assets), is higher than the signal provided by business collateral alone (Brick & Palia, 2007). The combination of pledging personal and business assets as collateral may provide a stronger signal since the owner of a low quality firm cannot afford to imitate a high quality firm owner due to the threat of losing the personal asset. As a result, this study also contributes to the debate by empirically testing the signaling role of lending technologies, such as personal collateral, business collateral (through pledging fixed assets) and financial statement lending.

In sum, service and hotel SMEs are an important component in Brazil’s economic growth. However, lack of access to capital deters them from expanding their operations. A possible reason for the limited access to capital may be due to information asymmetries, specifically adverse selection, as financial institutions may not have adequate tools to assess both the skills of individuals applying for finance and the project quality. To offset this information asymmetry between financial institutions and SMEs, the availability of lending technologies may signal banks higher-quality projects, and provide an incentive for small and medium-sized firms to perform according to contractual stipulations (Bester, 1987).

The theory of financial intermediation suggests designing a loan contract to solve the problem of adverse selection (Diamond, 1984). The theory also applies to the provision of intermediated finance in private markets to small, informationally opaque SMEs that lack credible financial information (Berger, Klapper, & Udell, 2001). Contract design is critical in the case of SMEs because their relationship with banking financial institutions may be
characterized by high levels of information asymmetry. Loan contracts may consist of personal and business collateral requirements, financial statement lending technology, loan maturity, and restrictive covenants, among others. These elements aim to reduce asymmetric information between SMEs and banking institutions.

The aim of this study is to investigate the impact of lending technologies on both access to capital and the size of loan contracts in the Brazilian credit market of service SMEs, including hotels. In addition, this study intends to compare access to capital between hotel SMEs and other small firms in the service sector, anticipating that hotel SMEs may have greater access to the adequate lending technologies than other service SMEs, and facilitating access to capital.
Chapter 2: Literature review

The study now proceeds to review the relevant literature regarding access to capital. It provides a general view of the theory of financial intermediation, access to capital and lending technologies’ advances in mitigating information asymmetry issues, and closely examines access to capital for SMEs both as a global issue and in the Brazilian credit market, with particular attention to hotel SMEs in the broader context of SMEs in the service sector.

**SME Access to Capital**

Although SMEs are important for a country’s economic growth, they may lack access to capital needed to expand their operations. The presence of information asymmetries between small firms and banks may constrain access to capital for SMEs to the point that they are excluded from the credit market. To reduce information asymmetry and provide banks a signal of firms’ creditworthiness, SMEs could use lending technologies, or guarantees stipulated in loan contracts in case of loan default.

The theory of financial intermediation suggests that bank specialization is important in producing both information regarding potential borrowers and loan contract design in order to minimize the problem of rationing in credit markets (Diamond, 1984). Since the relationship between banking financial institutions and SMEs may be characterized by high levels of information asymmetry, specializing in information production refers to the banks’ ability to monitor informationally opaque small businesses in order to reduce information asymmetries. As a result, loan contracts may consist of several lending technologies that aim to reduce asymmetric information between SMEs and banking institutions.

**Access to Capital in the Context of Low and Middle-Income Countries**

Berger and Udell (1998) reveal that the largest sources of capital for small and medium-sized businesses are owner’s equity through retained earnings and bank loans, which
account for nearly 70% of total funding. Most of SMEs do not have access to external sources of capital through loan contracts from banking institutions. Because SMEs rely more on internal funds, they are likely to be credit constrained (Berger et al., 2001). As a result, access to capital is critical to the competitiveness of small and medium-sized firms in emerging markets. The issue of adequate access to capital has been identified as a critical reason why SMEs in developing countries fail to start or increase their operations (Ayyagari et al., 2007). Limitations in access to capital tend to largely affect SMEs, constraining their growth and increasing the likelihood of firm exit (Ayyagari et al., 2008; Frazer, 2005). These firms need to be able to finance their activities through external sources in order to stay competitive and enhance financial performance.

Lack of adequate access to capital is a global issue that mostly affects low and middle-income countries since they are usually characterized by poor legal systems and lack of property rights protection (Beck, Demirguckunt, & Maksimovic, 2008), and consequently, service SMEs obtain less external financing and incur lower growth (Rajan & Zingales, 1998). Clearly, a competitive business environment would be propitious for SME growth in the developing world, as enforcement of property rights, provision of infrastructure services and efficient regulations may improve access to capital.

SMEs in the service sector are also more vulnerable in countries with less developed legal systems since firms in the service sector are more likely to be part of the informal economy (Maloney, 2004). As a result, service SMEs may be constrained in their access to capital in low and middle-income countries because they may not have the adequate legal protection that prevents them from exiting the market. For the formal economy, services SMEs in the developing world are still constrained by access to capital. These firms are less likely to apply for bank loans because they usually lack tangible assets that could be used as collateral (Thorsten Beck, 2005a; Riding, Madill, & Haines, 2007). As businesses in the
service sector are labor-intensive, where the main component is the human capital of the owner, capital requirements may be low for SMEs in the service sector in low and middle-income regions of the world.

**Access to Capital in Brazil**

Similarly, services SMEs face a set of challenges that prevents greater participation in the Brazilian credit market. Compared to other developing countries, SMEs in Brazil have high mortality rates (Zica & Martins, 2008). Over 50% of Brazilian SMEs do not survive the first year of operation. Among those that survive, only 20% of micro, small and medium-sized businesses survive after five years. Lack of access to capital may contribute to the exacerbated mortality rate of businesses in Brazil as limited access to financial services decreases the likelihood of SME survival (Britto et al., 2002). In addition, inefficiencies in the quality of loan contracts constrain access to external financing, hindering business expansion, and decreasing the likelihood for commercial banks to provide loans to SMEs (Pinheiro & Cabral, 1998).

In a more recent study, Galindo and Micco (2007) found that difficulty of access to financial markets is the major obstacle to expanding business operations in Brazil and other middle-income countries in Latin America. This obstacle comes first among other factors, such as macroeconomic instability, taxation and crime. The Brazilian financial system does not adequately cater to the needs of SMEs as the market for supply of financial services has consumers rather than firms as the main target. In addition, SMEs are subject to higher levels of information asymmetry (Carvalho and Abramovay, 2004). Lack of adequate collateral levels is the main obstacle that constrains SMEs from having access to financing (see Pombo and Herrero, 2006).
In comparison to large firms in Brazil, SMEs may be disadvantaged in the credit market. Kumar and Francisco (2005) found that firm size is an important determinant of access to capital, suggesting that small firms have limited access to capital. Terra (2003) also investigated issues of credit constraint in Brazilian firms, suggesting that small firms are more dependent on internal financing than large firms, and showing greater signs of credit constraint. This poses a potential problem as commercial banks appear to exclude SMEs from debt financing, and as a result, the ability of firm expansion and productivity growth are limited for SMEs (La Rovere & Shehata, 2006).

**The Role of Past Policies in Facilitating Access to Capital in Brazil**

Brazil has advanced significant changes in its economic development structure in the first decade of the 21st century. One example is the decrease of poverty levels and the ascent of over 1/7 of the population to the middle class. Osorio et al. (2011) investigated both structural characteristics and conditions of extreme poverty in Brazil. Their significant findings indicated that an increase in per capita GDP growth, greater generation of formal employment and an increase in minimum wage levels, reduction of income inequality and the expansion of conditional cash transfer programs were the main determinants for the significant reduction in poverty levels.

Another example of recent positive changes was the extension of access to capital to both micro, small and medium-sized enterprises and low-income communities. The main goal of this initiative was to provide wider access to financial services, mainly through state-owned banks, and formalize the informal sector (Barone & Sader, 2008). Expanded access to capital encouraged increases in consumption level of the population as a whole, broadening the demand for goods and services, and as a result, increasing both production and investment levels by firms. However, the generation of new jobs did not trickle down to the low-income
stratum of society due to low schooling levels and lack of an ample labor market for low-skilled labor in remote areas.

Income inequality has also fallen in Brazil during the first decade of the 21st century, reaching its lowest levels since record keeping began in 1960. Due to a combination of policies aforementioned, especially raises in minimum wages and facilitated access to capital, the income growth of the low-income stratum has had the most significant growth (Kakwani, Neri, & Son, 2010). In addition, the steep reduction in income inequality and increases in economic growth have contributed to diminishing by 93% the number of citizens who live below the extreme poverty line, reaching UN’s millennium development goal (IPEA, 2015).

During this first decade of the 21st century, increases in years of schooling and generation of employment have accompanied per capita GDP growth and income inequality reductions.

Although recent advances in Brazil are undeniable, the country is still vulnerable to institutional factors that are detrimental to progressing financial development. Among them, rigid enforcement of labor regulations may not only constrain firm size and lead to higher unemployment levels, but they may also be detrimental to SME growth and labor productivity (Almeida & Carneiro, 2009). A potential reason for this behavior is the disproportionate increase in labor costs. In addition, it may create incentives for evading labor regulation, allowing firms to gain access to cheap and informal labor.

Corruption is another relevant institutional factor that hinders SME growth. Brazil ranks second in 75 countries in bribe value that is expected to secure contracts with both government and large enterprises as a percentage of the contract value (Ramalho, 2007). SMEs in emerging markets, such as Brazil, are the most affected in terms of corruption, particularly through bribe payments as a percentage of annual sales (Thorsten Beck, 2005b). Previous literature also indicates that SMEs are more likely to pay bribes than larger firms.
In addition, bribery practices and the rate of tax evasion are negatively associated with SME growth and performance (Fisman & Svensson, 2007). Shleifer and Vishny (1993) argue that corruption may have greater negative effects than taxation due to high transaction costs and the unenforceability of corrupt contracts. This validates firm-level theories of corruption, which suggest that corruption delays SME growth (Svensson, 2003).

**The Impact of Current Economic Challenges on Access to Capital in Brazil**

In addition to institutional factors that deter economic and financial development in Brazil, recent economic downturn may severely affect SMEs from obtaining access to capital. Brazil’s GDP growth has plummeted, reaching negative values last year. According to a recent report from the International Monetary Fund (2016), GDP growth is expected to be -3.5% this year, forecasting zero growth for 2017. Several reasons are attributed to these economic changes in the last five years. Among them, sharp decreases in commodity prices, lower firm productivity levels, increases in the government budget deficit, and the abrupt slower economic growth in China have contributed to the slower economic growth in Brazil. In addition, recent corruption scandals involving government and state-controlled oil company Petrobras not only have destabilized the political structure, but they have also contributed to a significant decrease in foreign direct investments to the country. Due to the political uncertainty, Brazil’s current situation has been exacerbated since the downgrade of Brazil’s sovereign-credit rating, potentially increasing the borrowing costs for the government and weakening the currency.

The current economic and political turmoil may have serious effects in undermining recent advances. Recent upsurges in both the interest rate and inflation are likely to decrease the purchasing power of the lower-income population, offsetting the past advances in
reducing income inequality. The negative outlook of the economy may also affect access to capital in Brazil by increasing the costs of investing, and lessening the availability of long-term finance. In addition, lower economic growth may decrease the rate of financial intermediation, and divert external finance resources to a small number of larger firms. As a result, financial development that promotes broader access to financial services should be at the forefront of policymaking agendas. The central focus should therefore be on financial development and reforms of the business environment that simultaneously affect all enterprises, and on strategies that assist SMEs overcoming financial constraints that are specific to their size and risk level.

In order to maintain the financial development achieved in the first decade of the 21st century, particularly in extending access to capital to SMEs and the low stratum of the population, Brazil needs to readjust its macroeconomic policies. First, large public debt is a major obstacle to financial intermediation since it leads to high interest rates, market volatility, and a preference for short-term financial investments. Second, high tax burden (over 36% of GDP in 2014) and corruption not only lowers the supply of external finance, but they also make access to capital more expensive. Increases in the cost of capital, partially because financial intermediaries are also subjected to high taxes, may create incentives for SMEs to use their retained earnings as a source of financing, contributing to financial disintermediation. Finally, low protection of property rights raises the cost of capital and reduces the impact of financial intermediation on capital productivity, creating additional uncertainty in the Brazilian credit market.

Analyzing Brazil’s past successful initiatives and its current political and economic challenging state provides the possibility for a series of future areas of research, currently needed in Brazil. As it will be developed below, there is a strong need to understand the main factors that prevent SMEs from entering the credit market as well as how the interaction
between access to capital and other institutional factors, such as corruption and crime, influence not only firm performance, but also the country’s growth and economic development in the region. In addition, consensus is needed on the appropriate macroeconomic measures to foster and environment of growth and encourage the channeling of financial resources to high growth sectors.

*Lending Technologies*

A possible reason for this limited access to capital may be due to the presence of information asymmetry between lenders and borrowers (Stiglitz & Weiss, 1981). Information asymmetry increases the likelihood of adverse selection, as financial institutions may not observe ex-ante the skills of individuals applying for bank loans and their project quality. To minimize adverse selection between financial institutions and SMEs, the availability of lending technologies may signal high-quality and lower-risk projects to banks. Among those, the empirical literature identifies collateral and financial statement lending as contractual elements that may signal high quality projects to lenders (Berger, Espinosa-Vega, Frame, & Miller, 2011; Frank & Maksimovic, 2004; Steijvers & Voordeckers, 2002).

Lending technologies are key elements through which national financial structures, by providing a link with government policies, influence the availability of capital. Lending technologies have important effects on the access of capital for both opaque and transparent SMEs. The availability of different technologies – personal collateral, fixed-asset lending, financial statement lending – involve unique loan contract structures and mechanisms that act as an incentive for SMEs to truthfully reveal their risk. We will now briefly look into each of these lending technologies.

*Personal Collateral and Fixed Asset Lending*
Collateral requirements in a lending technology are important since they act as a personal or business asset guarantee in case of loan default. These lending technologies help signal the risk profile of SMEs and minimize the probability of default in loan contracts. In examining financing obstacles, Beck et al. (2006) reported that collateral requirements are the third most important reason firms do not apply for external funds. Therefore, collateralized loans appear to be a critical aspect of SMEs’ access to capital, determining whether firms survive or exit the market. The availability of sufficient collateral may provide an incentive for small and medium-sized firms to perform according to stipulations on loan contracts, and ensure that businesses will perform to the best of their ability as higher collateral requirements may have a signaling role, being more attractive for borrowers with lower probability of default, and help eliminating riskier projects (Bester, 1987).

The use of personal commitments to acquire external access to capital highlights an important aspect of small business finance (Ang, 1992). Personal commitments are broadly defined as personal collateral (i.e. personal assets) and/or personal guarantees (i.e. personal wealth) that may be pledged as collateral (Ang, Wuh Lin, & Tyler, 1995). Financial intermediaries may evaluate project quality according to the ability of owners to pledge personal assets as collateral. In conjunction with fixed asset lending, personal collateral would be more effective in reducing any informational asymmetry of the SMEs as it constrains the borrower’s preference for risky projects (Mann, 1997).

Chan and Kanatas’ (1985) theoretical model makes the distinction between personal and business collateral, concluding that the signaling role of both personal collateral and fixed asset lending is higher than fixed asset lending alone. Using both personal and fixed assets as collateral requirements may serve to mitigate asymmetric information about the borrower quality, since it can be used as a signal for borrower quality (Brick & Palia, 2007). In the case of potential adverse selection, where borrowers have superior information than
lenders, borrowers can use collateral as a signal of their quality (Bester, 1985). As a result, high-quality borrowers may be distinguished from low-quality borrowers in their ability to provide personal assets as collateral, reducing the problem of adverse selection.

This signal must be costly to low-quality SMEs in order to prevent them from mimicking the behavior of high-quality small firms. Because it involves a personal asset (i.e. owner’s house), the signal provides borrowers an incentive to truthfully reveal the quality of their project (Bester, 1994). Therefore, potential losses of personal assets make the signal more credible, acting as an incentive to loan repayment. In addition, a combination of personal and fixed assets as collateral better mitigates the lender exposure to losses than business collateral alone (Peltoniemi & Vieru, 2013). Since personal collateral may provide a signal for high-quality projects, our first objective is to investigate the impact of personal collateral, on the likelihood of obtaining access to capital (i.e. bank loans) for SMEs in the service sector that participate in the Brazilian credit market.

This study also seeks to measure the impact of pledging personal assets as collateral on the size of the loan contracts since the value of personal collateral a firm commits may facilitate negotiating loan size. Assuming that lending technologies, such as personal collateral, fixed-asset lending, and financial statement lending, will positively affect both the probability of access to capital and the size of loan contracts, the next logical step is to investigate the comparative effect of these lending technologies combined on access to capital and the size of loan contracts. In SME lending, personal collateral is widely used as a complementary to other lending technologies (Avery, Bostic, & Samolyk, 1998). In addition, a combination of personal collateral and fixed asset lending sends banks a stronger signal of SME creditworthiness than business collateral (Brick & Palia, 2007). Therefore, we expect the effect of pledging both personal and fixed assets as collateral to be greater than fixed asset lending. As a result, we hypothesize that:
H1. The total collateral size will affect access to capital of service SMEs (including hotel SMEs) in Brazil:

H1a. Personal collateral and fixed asset lending will have a higher impact on access to capital than fixed asset lending alone.

H1b. Personal collateral and fixed asset lending will have a higher impact on the size of loan contracts than fixed asset lending alone.

Firms may obtain more debt with an increase in the size of fixed asset collateral since these assets decrease agency costs (Harris & Raviv, 1991; Myers, 1977). Therefore, debt secured by fixed assets may increase the likelihood of debt recovery in case of loan default or bankruptcy, thus, reducing overall lender’s risk. Since hotels have most of their capital investments in fixed assets, they may offset demand volatility and operational risk associated with the industry by using the value of these assets as a guarantee for obtaining bank loans. The amount of fixed assets may show lenders that these available assets are employed efficiently, and as a result, they represent valuable collateral (Wald, 1999).

Hotels are characterized by higher levels of volatility from unstable cash-flows and demand uncertainty (Newell & Seabrook, 2006) and higher operational risk due to their sensitivity to systematic risks (Devesa & Esteban, 2011). Hotels have a high capital-intensive nature since they require large capital amounts for operations and investment. Given both demand uncertainty and high operational risk, fixed assets may give lenders an additional security when issuing debt given the collateral value of these assets (Dalbor & Upneja, 2004; Upneja & Dalbor, 2001). In other words, financial institutions care more about fixed assets of the hotel sector than other service sector in order to offset hotel’s operational risks.

Similar findings were found in Turkish small-sized hotels as lenders are more comfortable with hotel fixed assets being pledged as collateral since it may decrease agency
problems (Karadeniz, Kandir, Balcilar, & Onal, 2009). Comparing hotels and software firms, moreover, Tang and Jang (2007) also found that fixed assets are a greater and significant determinant for obtaining loans in the hotel sector. This also suggests that debt secured by fixed assets may mitigate the hotel industry’s high operational risk.

SMEs with large proportions of tangible fixed assets often have greater access to bank loans than SMEs with low proportion of fixed assets, tending to have loan contracts according to the tangible fixed assets pledged as collateral (Abor & Biekpe, 2007). Therefore, hotel SMEs may be more likely to obtain loan contracts than other SMEs in the service sector because of the greater ability to pledge fixed assets as business collateral since SMEs possessing fixed assets with a higher collateral size may find easier to get access to bank loans (Elgonemy, 2002; Nguyen & Ramachandran, 2006). As a result, we hypothesize that:

**H2:** Hotel SMEs will be more likely to have access to capital than other service SMEs in Brazil.

*Financial Statement Lending*

Lending technologies other than personal collateral and fixed assets lending may be also used to screen out riskier projects. Financial statement lending is a technology primarily based on the strength of a borrower’s financial statement (Berger & Udell, 2006). Transparent small and medium-sized firms that have their financial statements revised by an external auditor or that rely on international accounting standards are likely to be less susceptible to problems of information asymmetry (Brown et al., 2009). External audits are likely to provide credibility to SMEs’ financial statements by detecting questionable accounting practices and mitigating uncertainty (Sikka, 2009).
Allowing external auditors to check the validity of financial statements may also reduce information asymmetries, especially considering adverse selection resulting from the borrower’s private information (Becker, Defond, Jianalvo, & Subramanyam, 1998). Strong accounting standards and credible independent accounting firms are necessary conditions for informative financial statement. Information opacity is a critical characteristic of SMEs as most small businesses do not have their financial statements audited by external accounting procedures in order to share with lenders. As a result, firms may not credibly convey their quality (Berger & Udell, 1998). Conversely, SMEs that are subjected to a certified external auditing procedure may be more likely to obtain loans from formal banking financial institutions than those without proper auditing. In the case of the service sector, hotel SMEs may be more likely to have external auditors than other service firms since the Brazilian Association of Hotel Industry (ABIH) requires SMEs follow homogeneous accounting principles in building their financial statements (IBGE, 2012). Financial statement lending technology may also positively influence the size of loan contracts since it potentially signals banks high-quality projects. Therefore, this study hypothesizes that:

**H3.** Financial statement lending will have a greater influence for hotel SMEs than for other service SMEs in Brazil:

**H3a.** On access to capital.

**H3b.** On the size of loan contracts.

*Type of Financial Intermediary*

Another critical factor in SME lending is the presence of a lower density of commercial bank branches. This may contribute to the increased difficulty in the access of capital in Brazilian remote areas. In addition, private commercial banking institutions may not adequately evaluate SMEs’ credit risk because small businesses lack credible financial
statement information (Kumar, Beck, Campos, & Chattopadhyay, 2005). As a result, commercial banks adopt rigorous criteria to provide loan contracts, excluding most SMEs. Conversely, state-owned banks are more likely to serve smaller types of businesses with limited access to private-sector credit since they have a higher branch density than private commercial banks, reaching smaller communities (Berger, Klapper, Martinez Peria, & Zaidi, 2008). In addition, federal law mandates that state-owned banks incorporate both microenterprise lending and small business lending as a large proportion of their lending requirements (Kubota & Almeida, 2011). These issues may increase the importance of state-owned banks in reaching smaller firms in remote, impoverished communities since private commercial banks may find it risky to lend under these circumstances.

Brazilian state-owned banks provide 40% of their loans, on average, to SMEs in the manufacturing and service sectors (Morais, 2006). Past initiatives to support SME growth have focused on credit supply, especially through the use of lending technologies. Brazilian state-owned development and non-development banks, such as BNDES and Caixa Economica Federal, are pivotal to the success of this policy implementation. Previous research shows that state-owned banks may be better equipped to provide loans to small businesses in middle-income countries since they appear to be more risk tolerant than private commercial banks (Levy, 1993). As a result, the study further hypothesizes that:

**H4.** Type of financial intermediary will affect the provision of access to capital of service/hotel SMEs in Brazil:

**H4a.** State-owned banks will have a greater impact on providing access to capital than private commercial banks.

**H4b.** State-owned banks will have a greater impact on the size of loan contracts than private commercial banks.
Summary of Hypotheses

To summarize the study’s development of hypotheses, the aim of this study is to investigate the impact of lending technologies on access to capital and the size of loan contracts in the Brazilian credit market, focusing on a comparison between hotel and other service SMEs. More specifically, the first objective aims to investigate the impact of lending technologies, such as pledging personal assets and fixed assets as collateral, and financial statement lending on the probability of having access to capital for SMEs in the service sector that participate in the Brazilian credit market. The study hypothesizes that lending technologies will both increase access to capital and have a positive impact on the size of loan contracts for service SMEs in the Brazilian credit market.

This assessment is important because these guarantees not only may increase the likelihood of obtaining bank loans, but they may also facilitate access to better terms in loan contracts. SMEs with expanded access to credit markets are more likely to survive (Cressy, 2006; Frazer, 2005) and promote firm growth (Carpenter & Petersen, 2002). Access to capital is a critical component for the performance of small businesses as firms excluded from the credit market may be constrained in their ability to expand their operations and incur improvements in firm performance.

Further, the study anticipates that hotel SMEs will have greater access to capital and larger loan contracts than other SMEs in the service sector since hotels usually have facilitated access to lending technologies and higher levels of fixed assets that can be pledged as collateral, signaling high-project quality to lenders (Elgonemy, 2002). Finally, the type of financial has an important role in providing access to capital to SMEs in middle-income countries as state-owned banks are more tolerant to risky projects than private commercial banks (Levy, 1993). Consequently, the study also anticipates that Brazilian state-owned
banks will provide greater access to capital and larger loan contracts to service SMEs than private banks. The next section discusses the research methodology the study intends to use, providing a brief description of the research design, nature of the data, statistical analyses and tests to be conducted.
Chapter 3: Research Methodology

This section briefly describes the research design and data to build statistical inferences. In addition, we provide comprehensive information about statistical techniques and variables used to test each hypothesis in the study.

Research Design

The study proposes a quantitative research design using secondary data since it aims to test empirically objective theories by examining the relationship among a certain set of variables. In addition, the selected strategy of inquiry is a non-experimental (survey) cross-sectional research design. Survey research provides quantitative analysis of specific variables related to a population sample, with the main purpose of generalizing the results from a sample to a population so that inferences can be made about the variables studied in the sample (Cresswell, 2011).

The study proposes a post-positivist philosophical worldview. Guba (1990) defines worldview as a set of beliefs that guide action, whereas Cresswell (2012) defines worldviews as a broad orientation about the world and the nature of research held by the researcher. These worldviews are shaped by the discipline area of the study, beliefs of advisers and faculty members, and past research experiences. Within this context, the post-positivist worldview is characterized by its reductionist view of the world in the sense that its main objective is to reduce the ideas into a small set of ideas to test (i.e. variables that comprise research questions and hypotheses).

Knowledge development is achieved through constructing numeric measures of observations and studying the behavior of individuals. Phillips and Burbules (2000) enumerate the main assumption of this philosophy. For instance, post-positivists perceive knowledge as conjecture since absolute truth can never be found, and hence, research
evidence is always fallible (i.e. hypotheses cannot be proven). In addition, data and evidence shape knowledge, as post-positivist researchers are concerned with the relationship among variables, posing it in terms of research questions and hypotheses.

Data

Data needed to address the issue of access to capital comprised of information regarding access to capital for SMEs in Brazil. More specifically, the study sought to obtain data regarding 1) SMEs’ sources of capital to finance both the purchase of fixed assets and working capital, 2) access to bank loan contracts, loan sizes, collateral requirements and other lending technologies, such as financial statement lending. Although access to capital data could be obtained directly from Brazilian institutions or collecting in the field, data from the World Bank was used because it was a more comprehensive source of data for small and medium-sized businesses. In addition, the data was a better fit for the study’s objectives as it included most of the variables of interest.

Dataset and Sampling Method

On a series of enterprise surveys denominated World Bank Enterprise Surveys (WBES), the World Bank collected cross sectional firm-level data in 2010 that contained information regarding business environment indicators in Brazil, such as infrastructure, extent of crime and losses due to crime, corruption, access to credit and sources of capital, number of competitors and innovation activities, firm performance, labor issues and business-government relations. It used a global systematic approach providing full data comparability across countries and regions, based on the survey implementation homogeneity and a consistent sampling definition for inferential purposes (World Bank, 2012). The World Bank also used a standardized survey instrument, stratified random sampling according to sector of activity, geographical location and firm size, generating representative samples of formalized
nonagricultural and nonfinancial businesses in the private sector, available for over 120 low and middle-income countries worldwide.

Stratification by firm size divided the population into three strata: small, medium and large firms. Geographical distribution included areas clustered in urban centers, as samples did not include agricultural economic activity. Stratification by sector of activity was primarily based on the size of the national economy, measured by Gross National Income (GNI) in 2009. Table 2 categorizes size of the national economy in terms of volume of economic national activity. The survey’s sampling methodology generated appropriate samples in order to analyze firm performance, and derived data to determine the impact of business environment indicators on productivity and job creation, targeting individual economies in the developing world.

The sampling design also required the implementation of quality control procedures. Data was delivered in three instances before its full completion, and a series of tests was conducted after each of these deliveries. These tests were responsible for detecting patterns that would violate logical assumptions, identifying outliers in firm performance variables and on the distribution of logged values, since some of the performance variables are skewed.

Questionnaire

WBES also used a homogeneous questionnaire across all regions worldwide to ensure full data comparability across countries. However, the homogeneous nature of the questionnaire may pose challenges when dealing with a country’s specific business environment indicator. For instance, banks may offer different forms of loans that are present in some countries, but not in others. Another challenge of a homogeneous questionnaire is to account for local characteristics of different countries in the design of this firm-level survey. Discussing gender issues in management may be inappropriate in certain countries, or
questions about corruption practices, such as bribe payments, are controversial. There may also be major differences in the willingness of businesses to reveal financial information.

The questionnaire was administered through an extensive interview process with firm owners and, in some cases, CEOs or managers, where the firm is the sampling unit. For all countries surveyed, the reference period of most of the question was the last completed fiscal year. WBES was implemented in two steps. First, the World Bank conducted a screener questionnaire to determine whether a firm was eligible to participate or not. The second state was the face-to-face interview, where the respondent filled out the questionnaire. Using a pilot study, WBES tested for language mistakes and timed the questionnaire duration. Due to potential problems with translation, moreover, the interviewers used back translation, and hired a contractor to check for accuracy. Local lawyers and accountants were also consulted to preserve the original meaning of English legal terms and accounting definitions.

The survey for Latin America covered 31 countries, ranging from very small to large according to the size of their national economy. The overall size of an economy may determine important characteristics of the business environment in a particular country, including efficiency of the judiciary system and regulatory procedures, the size of the private sector, trade patterns and supply and demand conditions. The sample size of the survey in Brazil was comprised of 292 service SMEs, representative for all major urban areas in Brazil, with 43 SMEs are hotels. The other predominant firms in the service industry were retail and IT sectors.

**Variable Description**

The study was primarily interested in the variables related to access to capital for SMEs in Brazil. The questionnaire’s section related to access to capital can be found in the Annex of this document. First, understanding how small firms finance both purchases of
fixed assets and working capital was of interest in order to observe whether SMEs were constrained by internally generated funds, or had access to bank and non-bank loans, and other forms of obtaining access to external finance (i.e. through moneylenders, friends and relatives).

Second, the data provided information regarding access to bank loan contracts and the approved size of loans. For collateralized loans, this study had access to the collateral value, both in absolute terms and as a percentage of the loan size and the required types of collateral. Additionally, the questionnaire included the main reasons for not applying for bank loans, number of rejected loans and whether external auditors certified financial statements.

**Hypothesis Development**

This section depicts the variables’ description used in each hypothesis. Table 3 presents a summary of all hypotheses, while table 4 presents a list with all variables in the models.

**H1.** The size of collateral will affect access to capital of service SMEs (including hotel SMEs) in Brazil

**H1a.** Personal collateral will have a higher impact on access to capital than other lending technologies.

*Outcome variable:* The observed binary outcome variable indicates whether a SME currently has a loan or line of credit from a financial institution, and takes one of two values:

\[ loan_i = \begin{cases} 1, & \text{if the } i \text{-th SME currently has a bank loan} \\ 0, & \text{otherwise} \end{cases} \]
Explanatory variables: we use all four explanatory variables in the same logit model. These variables refer to the lending technologies previously mentioned, such as personal collateral, fixed-asset lending, financial statement lending.

H1b. Personal collateral will have a higher impact on the size of loan contracts than other lending technologies.

Outcome variable: The outcome continuous variable is the log-transformed size of the loan contract.

Explanatory variables: we use all four explanatory variables from the previous hypothesis. These variables refer to the lending technologies previously mentioned, such as personal collateral, fixed-asset lending and financial statement lending.

H2. Hotel SMEs will be more likely to have access to capital than other service SMEs in Brazil.

Outcome variable: The observed binary outcome variable indicates whether a SME currently has a loan or line of credit from a financial institution, and takes one of two values:

\[
\text{loan}_{i} = \begin{cases} 
1, & \text{if the } i\text{-th SME currently has a bank loan} \\
0, & \text{otherwise}
\end{cases}
\]

Explanatory variable: We use fixed-asset lending as the explanatory variable, indicating the log value of fixed assets used as collateral.

H3. Financial statement lending will have a greater influence for hotels than other service SMEs in Brazil:

H3a. On access to capital.

Outcome variable: The observed binary outcome variable indicates whether a SME currently has a loan or line of credit from a financial institution, and takes one of two values:
\[
\text{loan}_i = \begin{cases} 
1, & \text{if the } i \text{-th SME currently has a bank loan} \\
0, & \text{otherwise}
\end{cases}
\]

**Explanatory variable:** financial statement lending is the dichotomous explanatory variable, indicating whether the SME had its annual financial statement certified by an external auditor:

\[
\text{financial statement lending}_i = \begin{cases} 
1, & \text{if FS revised by external auditor} \\
0, & \text{otherwise}
\end{cases}
\]

**H3b.** On the size of loan contracts.

**Outcome variable:** The outcome continuous variable is the log-transformed size of the loan contract.

**Explanatory variable:** financial statement lending is the dichotomous explanatory variable, indicating whether the SME had its annual financial statement certified by an external auditor:

\[
\text{financial statement lending}_i = \begin{cases} 
1, & \text{if FS revised by external auditor} \\
0, & \text{otherwise}
\end{cases}
\]

For hypotheses 2-4, we plan to add interaction terms between SME hotels and the four lending technologies of interest in the full regression models. Hotel is a binary variable, coded as:

\[
\text{hotel}_i = \begin{cases} 
1, & \text{if the } i \text{-th SME is a hotel} \\
0, & \text{other service SMEs}
\end{cases}
\]

**H4.** Bank type will positively affect the provision of access to capital of service/hotel SMEs in Brazil:
**H4a.** State-owned banks will have a greater impact on providing access to capital than private commercial banks.

**H4b.** State-owned banks will have a greater impact on the size of loan contracts than private commercial banks.

For hypothesis 5, we plan to add interaction terms between type of financial intermediary and the four lending technologies of interest in the full regression model. Bank is a binary variable, coded as:

\[
bank_i = \begin{cases} 
1, & \text{if banks are state-owned} \\
0, & \text{private commercial banks}
\end{cases}
\]

In addition, consistent with previous literature, all hypotheses will utilize several control variables that mainly refer to firm characteristics (Becchetti & Trovato, 2002; Nichter & Goldmark, 2009; Söderbom & Teal, 2001) and owner characteristics (Bardasi, Sabarwal, & Terrell, 2011; Coleman, 2000). The study controls for firm age using a continuous log transformed variable and firm size using number of employees. The study also controls for hotels (1=hotel SMEs, 0=Other SMEs in the service Sector), ownership (1= Sole Proprietorship, 0= Others), bank (1=state-owned bank, 0=private commercial bank). We also include a dummy variable to control for owner’s gender (1=Female, 0= Male) as previous research indicates that female-owned firms may have lower labor productivity less access to capital (Aterido & Hallward-Driemeier, 2011; Bardasi, Sabarwal, & Terrell, 2011). In addition, we use years of experience working in the service industry to control for owner’s experience as previous research has indicated that they are important determinants of access to capital (Thorsten Beck et al., 2006; Thorsten Beck, Demirgüç-Kunt, & Peria, 2008).

*Data Analysis*
The study will use both logit model and ordinary least squares (OLS) regression to investigate the proposed hypotheses using the aforementioned variables. These methods, including the appropriate statistical tests, will be explained in the paragraphs below.

**Logit Model**

The study intends to use the logit model to predict the effect of lending technologies on the probability of service SMEs obtaining bank loans in the Brazilian credit market. Logit model interpretations of an endogenous binary variable are in form of likelihoods (Hosmer & Lemeshow, 2013). In logit models the variable to be explain is a random variable that takes on the values zero and one, indicating whether a certain event has occurred or not. In the binary response model, the coefficient is used as the exponent in calculation odds ratio, defined as the probability that an event occur divided by the probability that it does not occur (Wooldridge, 2002). Assume an unobserved variable $y_i^*$ that is related to the observed explanatory variables by the structural model

$$y_i^* = x_i' \beta + \epsilon_i,$$

where $\beta$ is a vector of regression coefficients, $i$ indicates the observation and $\epsilon$ is a random error. Formally, the logit link function is given by

$$\ln \left[ \frac{p(y_i^*)}{1-p(y_i^*)} \right] = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_i x_{ii}.$$

We are interested in individual coefficients. Therefore, the study plans to use Wald chi-square approach to test the hypothesis that the probability of the characteristic depends on the value of the $i$-th variable:

$$H_0: \beta_i = 0$$

$$H_a: \beta_i \neq 0$$
This study also plans to test for overall model significance. This chi-square statistic is computed after data are grouped in similar predicted probabilities. The main idea of the test is to compare these predicted probabilities with the observed data (Hosmer & Lemeshow, 2013). This test is useful in the case that there are more than one explanatory continuous variable in the model (Agresti, 2007). The null hypothesis is given by:

\[ H_0: \text{the current model fits well} \]

\[ H_a: \text{the current model does not fit well} \]

Since the null hypothesis—is-goodness of fit, the logit model should not reject the null hypothesis.

We also used pseudo R-squared tests, such as Cox and Snell R-squared and Nagelkerke R-square, to demonstrate the explained variability in the model. Cox and Snell R-squared test reflects the improvement from the null model to the fitted model. The ratio is indicative of the degree to which the model parameters improve the prediction of the null model. As a result, a smaller ratio would indicate higher R-squared, and therefore, a greater improvement (Hair, Black, Babin, & Anderson, 2009). Nagelkerke R-squared adjust Cox and Snell’s test such that the range of all possible values is extended to 1. As a result, Nagelkerke R-square test will be equal to 1 if the full model perfectly predicts the outcome.

**The Ordinary Least Squares (OLS) Regression Model**

In addition, the study is interested in examining the impact of lending technologies on the size of loan contracts. This relationship may be specified by the OLS regression equation:

\[ y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i + \epsilon_i \]

Similar to the logit model, we intend to test whether individual coefficients significantly differ from zero using t-tests. In addition, the study will conduct specification
tests since the starting point for analysis in the OLS regression model is to assume that $\epsilon_i$ satisfies the classical (Gauss-Markov) assumptions of exogeneity of regressors, conditional homoscedasticity and conditionally uncorrelated observations. To test for homoscedasticity, the study plans to use the Breusch-Pagan test to account for constant variance:

$$H_0: \sigma_i^2 = \sigma^2$$

$$H_0: \sigma_i^2 \neq \sigma^2$$

where $\sigma_i^2$ is the error variance for the $i$-th observation. Failure to reject the null hypothesis indicates that variance is constant across all level of the explanatory variables.
Chapter 4: Results

Table 5 illustrates the descriptive statistics. The size of SMEs in the Brazilian service sector ranges from 10 to 90 employees. The average number of employees is 30, with a standard deviation of approximately 20. The age of SMEs ranges from 3 to 58 years, with an average and standard deviation of 15.6 and 10.2 years respectively. For SMEs that pledge collateralized assets, the average collateral value is USD 236,747.50, with a standard deviation of $303,250.30. In addition, the size of loan contracts given by financial intermediaries is, on average, USD 193,791.10, with a standard deviation of $581,738.10. Next, this study presents the results according to the list of hypotheses.

Hypothesis 1a: The Impact of Personal Collateral and Fixed Asset Lending on Access to Capital

Results of logit analysis (Model 1, Table 6) established that pledging fixed asset collateral increases the likelihood of obtaining loan contracts by 1.593 times. The model also found that personal collateral decreases the likelihood of access to capital, although the result is not statistically significant. This finding contradicts with other empirical evidence that suggests the importance of personal guarantees for SMEs in obtaining loan contracts (Ang et al., 1995). As a result, hypothesis 1a, suggesting that SMEs pledging personal collateral in addition to fixed asset lending would have a higher likelihood of obtaining access to capital than SMEs without personal collateral, is not supported. The first logit model was statistically significant ($\chi^2(11) = 28.55, p < .005$).

In addition, model 1 results showed that having the financial statements revised by external accounting procedures also increases the likelihood to access to capital, although this result is not significant. There is also evidence to suggest that hotel SMEs are more likely to obtain access to capital than other SMEs in the service sector. This result is statistically
significant at the 10% level (p-value=0.090). Evidence also indicates that firm size is a strong predictor of access to loan contracts. The result is statistically significant at the 1% level (p-value=0.003). This means that SMEs with higher number of employees are more likely to have access to loan contracts. There is also significant evidence to suggest that SMEs with sole proprietor ownership are more likely to have access to capital (p-value=0.072). State-owned banks (p-value=0.872) and older firms (p-value=0.106), are more likely to provide loan contracts than private commercial banks in Brazil, although the result is not statistically significant The results also indicate that women-owned SMEs (p-value=0.453) and owner’s years of experience (p-value=0.376) are less likely to obtain access to capital. However, these results are also not statistically significant.

Model 2 in table 6 ($Wald \chi^2(11) = 30.15, p < .005$) includes the interaction term between log-transformed collateral size and a dummy for fixed asset collateral. The interaction term also increases the likelihood of access to capital, but the result is not statistically significant (p-value=0.908). In addition, there is nonsignificant evidence that pledging fixed asset lending increases the likelihood of obtaining loan contracts (p-value=0.167). Similar to model 1, firm size, firm age, hotel SMEs and sole proprietorship are all significant evidence that indicate greater likelihood of obtaining loan contracts. Model 3 in table 6 ($Wald \chi^2(11) = 28.70, p < .005$) presents the interaction term between log-transformed collateral sized and a dummy for personal and fixed assets collateral. The finding suggest that pledging personal assets as collateral decreases the likelihood of obtaining access to capital, although the result is not statistically significant. Similar to previous models, firm size, firm age, hotel SMEs and sole proprietorship are all significant evidence of greater probability of access to capital.

Hypothesis 1b: The Impact of Personal Collateral and Fixed Asset Lending on Loan Size
Results of the OLS model (Model 1 table 7, F(11, 236)= 288.48, \( p < .0001 \)) suggested that an increase on the size of loan contracts has a positive impact on collateral size, holding other variables constant (p-value=0.000). Fixed asset lending has a significant negative relationship with the size of loan contracts (p-value=0.069). The results show that loans with fixed asset collateral have lower loan amounts than those with other types of collateral holding other variables constant. Other types of collateral include accounts receivable, inventories, and other forms of collateral. Significant results are also found for both firm size (p-value=0.000) and age (p-value=0.073), indicating that a doubling in both the number of employees and years increases the loan size by 18% and 13% respectively. There is also a negative impact of including personal assets as collateral guarantees on loan size, although the result is not statistically significant (p-value=0.872).

Another interesting significant finding indicates that women SME owners receive a greater loan amount than their male counterparts (p-value=0.019). Hotel SMEs were also found to obtain greater loan amounts than other SMEs in the service sector, but results are not statistically significant (p-value=0.382). Although results are not significant, in addition, financial statement lending (p-value=0.872) and owner experience (p-value=0.300) are negatively related with the size of loan contracts.

Model 2 in table 7 (F (12, 235) =288.42, \( p < .0001 \)) includes the interaction term between the log-transformed collateral size and fixed asset lending. As expected, the findings a greater positive impact of size of collateral with fixed asset on loan size than collateral requirements that do not require collateral guarantees, although the result of the moderating effect is not significant (p-value=0.101). Similar to model 1, collateral size, fixed asset lending, firm size, firm age and women SME owners show positive significant results. Model 3 of table 7 (F (12, 235) =279.66, \( p < .0001 \)) included a different moderator by interacting log-transformed collateral size with personal assets pledged as guarantees. The results
indicate a significant positive impact on loan size. As a result, hypothesis 1b, suggesting that the addition of personal assets and fixed asset lending will have a higher impact in the value of loan contracts than fixed asset lending alone, is supported.

**Hypothesis 2: Likelihood of Access to Capital between Hotel SMEs and Other Service SMEs in Brazil.**

This study also performed additional logit regressions based on type of financial intermediary, sector and SME size. The main reason for performing these additional regressions was to better differentiate results among SMEs. Table 8 depicts the results of the logit regressions. Columns 1 (Wald $\chi^2(7) = 11.14, p > 0.10$) and 2 (Wald $\chi^2(7) = 20.16, p < 0.05$) in table 8 differentiate between hotel SMEs and other SMEs in the service sector. The results suggest hotel SMEs are more likely to obtain loan contracts than other SMEs in the service sector, provided the use of fixed assets as guarantees. The result is statistically significant only in column one (p-value=0.036). Consequently, hypothesis 2, suggesting that hotel SMEs are more likely to have access to capital than other SMEs in the service sector, is supported. In addition, there is significant evidence indicating that hotel SMEs that use fixed asset lending is nearly 3 times more likely to have access to capital than hotel SMEs that use other types of collateral. Sim (p-value=0.069). Similar to previous models, pledging personal assets as collateral guarantees is associated with a decrease in the probability of access to capital, although the result is significant only for hotel SMEs.

**Hypothesis 3a: The Impact of Financial Statement Lending on Access to Capital**

SMEs in the service sector, including hotels, are more likely to have access to credit provided they have audited financial statements. Significant results show that the odds ratio is slightly higher for SMEs in the service sector other than hotels (p-value=0.001). This result does not support hypothesis 3a since it was anticipated that financial statement lending would
have a greater influence on access to capital for hotel SMEs than for other SMEs in the service sector. Columns 1 and 2 of table 8 also showed significant results that suggest that older SMEs in the service sector are more likely than younger one to have loan contracts (p-value=0.034)

**Hypothesis 3b: The Impact of Financial Statement Lending on Loan Size**

Table 9 compares the impact of lending technologies on loan size, differentiating the OLS results between hotel SMEs (F(10, 22) =23.49, p < .0001) with other SMEs in the service sector (F(10, 204) =292.51, p < .0001). Overall, the findings of the models suggest a greater positive impact of collateral size on the loan value for hotel SMEs than for service SMEs. Likewise, increases in the value of loan contracts due to increases in the size of SMEs are higher for hotel SMEs than for other service small and medium-sized businesses. Conversely, results showed that auditing financial statements has a negative impact on loan size for hotel SMEs (p-value=0.713), whereas it has a positive impact for other SMEs in the service sector (p-value=.836), not supporting hypothesis 3b. It is also important to note gender effects in the loan value (p-value=0.014). There is significant evidence to suggest that women-owned SMEs have access to higher loan amounts than their male counterparts in the service sector other than hotels. For hotel SMEs, results show that women-owned businesses have a lower loan amount than their male counterpart although the results are not statistically significant (p-value=0.593).

**Hypothesis 4a: State-Owned Banks and Access to Capital**

Columns three and four of table 8 are related to the type of financial intermediary, state-owned banks (Wald $\chi^2(9) = 24.26, p < 0.005$) and private commercial banks (Wald $\chi^2(9) = 20.73, p < 0.05$) respectively. State-owned banks are more likely to provide loans to SMEs that use fixed assets as collateral than private commercial banks, although the results are only
statistically significant for private commercial banks (p-value=0.045). Therefore, hypothesis 4a, suggesting that state-owned banks will have a greater impact on providing access to capital than private commercial banks, is partially supported.

SMEs who have their financial statements revised by an external accounting procedure are also more likely to obtain loan contracts in state-owned banks than private commercial banks, although results are significant at the 10% level for state-owned banks only. Moreover, while women SME owners are less likely to obtain loan contracts in private commercial banks, they are more likely to have access to capital than their male counterparts if state-owned banks are providing the loans. However, the results are not statistically significant (p-value=0.417 and 0.658 respectively). Significant results also show that older firms are more likely to have access to capital from private commercial banks. The reverse is true for state-owned banks, but results were also not statistically significant (p-value=0.271).

The fifth and sixth columns of table 8 relate to SME size, comprising small-sized enterprises ($Wald \chi^2(10) = 15.16, p > 0.10$) and their medium-sized counterpart ($Wald \chi^2(10) = 19.68, p < 0.05$). There is significant evidence to suggest that the probability of attaining loan contracts is greater for small-sized enterprises that use fixed assets as collateral guarantees than for medium-sized businesses (p-value=0.007). In addition, significant evidence indicate that small-sized firms that have their financial statements audited are nearly 4 times more likely to have access to capital than those small-sized businesses whose financial statements are not audited (p-value=0.022). Surprisingly, the reverse is true for medium-sized enterprises, but the result is not statistically significant (p-value=0.829). Firm size is also shown to significantly increase the probability of obtaining loans for both small and medium-sized enterprises (p-value= 0.078 and 0.001 respectively). Firm age and banks present similar effects for SMEs, but the results are not statistically significant.
Table 10 of this study shows the OLS results for both state-owned and private commercial banks. Overall, the significant results of the interaction terms suggest that an increase in size of collateral with fixed asset lending increases the size of loan contracts for both state-owned (p-value= 0.034) and private commercial banks (p-value=0.078) compared to those loans that do not require fixed asset lending guarantees. This indicates that the type of financial intermediary affects the provision of access to capital for SMEs in the Brazilian service sector, supporting hypothesis 4b. Gender also shows significant effects for private-commercial banks. In general, women SME owners have higher loan amounts than their male counterpart.

Overall, collateral size yields greater loan values for private commercial banks than for state-owned banks. Conversely, the effect of both firm size and firm age on the loan size is greater for state-owned banks. Hotel SMEs also appear to have greater loan amounts than other SMEs in the service sector for both types of financial intermediary by at least 22% in the sample of loans provided by state-owned banks and 2% for private commercial banks. However, the last results that refer to type of service sector are not statistically significant. Likewise, financial statement lending are negatively associated with the loan provision from state-owned banks, while being positively related with the loan amount provided by private commercial banks.

Summary of Hypothesis Findings

Table 11 provides a summary of the hypotheses’ results. This study also found significant evidence to

- Support a positive impact of personal collateral the size loan size (hypothesis 1b), and
• Hotel SMEs are also more likely to have access to capital than other SMEs in the service sector (hypothesis 2).

In addition, significant results demonstrate the importance of state-owned banks in providing access to capital to SMEs. The findings indicate significant evidence that

• State-owned banks are more likely to provide access to capital (hypothesis 4a), and

• State-owned banks provide greater size of loan contracts than private commercial banks in Brazil (hypothesis 4b).

However, this study did not find significant evidence to

• Support a positive impact of personal collateral on both access to capital (hypothesis 1a), and

• A greater impact of financial statement lending on access to capital for hotel SMEs than for other service SMEs (hypotheses 3a and 3b).

Overview of the Significant Findings

To summarize the significant findings from the logit models, evidence suggests that fixed asset lending increases the probability for service SMEs to obtain loan contracts. In addition, hotels, sole proprietor ownership, larger and older SMEs are more likely to have access to capital. Evidence suggests that service SMEs with audited financial statements are more likely to obtain loans from state-owned banks than private commercial banks. Financial statement lending also increase the likelihood of obtaining loans for small-sized enterprises in the service sector (excluding hotels). Older firms are also more likely to have access to capital than younger firms in the SME service sector, including hotels. Finally, hotel SMEs
are more likely to have access to capital than other service SMEs if they possess fixed asset lending. Conversely, pledging personal assets as collateral decreases the probability of obtaining loan contracts. Next, this study examines the OLS regression results.

A summary of the significant findings from OLS regressions indicate strong evidence suggesting a positive relationship between the amount of collateral the size of loan contracts. The interaction terms also suggest that collateral size increase the loan value with the presence of fixed asset lending and personal collateral, respectively. Significant results also indicate that larger, older, and women-owned SMEs have access to greater loan amounts. In addition, collateral, firm size and firm age effects are greater for loans provided by state-owned banks than by private commercial banks. Hotel SMEs also have higher collateral and firm size effects that other SMEs in the Brazilian service sector. The next chapter provides further discussion of both logit and OLS results, putting into context with changes in economic development in Brazil, and suggesting potential implications for policymakers.
Chapter 5: Discussion

The purpose of this study was to investigate the impact of lending technologies on: 1) access to capital and 2) the size of loan contracts in the Brazilian credit market, comparing hotel SMEs to other small and medium-size businesses in the service sector. It also aimed to investigate the impact of lending technologies, such as pledging personal assets and fixed assets as collateral and financial statement lending on both the likelihood of obtaining bank loans and the size of loan contracts for Brazilian SMEs in the service and hotel sectors.

Fixed Asset Lending and Personal Collateral

The results of this study suggest that both fixed asset lending, such as business and personal collateral, and financial statement lending are important components for service and hotel SMEs in the increase of the size of loan contracts. In addition, hotel SMEs are nearly 3 times more likely to obtain access to capital than other SMEs in the service sector. This finding supports the notion that financial institutions may require greater levels of fixed asset lending to reduce uncertainty, due to the operationally risky nature of hotels (Upneja & Dalbor, 2001; Wald, 1999).

Given both demand uncertainty and high operational risk, fixed assets may give lenders, such as financial intermediaries, an additional security when issuing debt given the collateral value of these assets (Dalbor & Upneja, 2004), indicating that debt secured by fixed asset lending may mitigate the hotel industry’s high operational risk. Therefore, the hotel industry may be in better position to use fixed asset lending as collateral guarantees since it may be possible that hotels have more fixed assets than other SMEs in the service sector. This may explain the greater likelihood of hotel SMEs to obtain loan contracts.
Financial Statement Lending

Given the likelihood of low fixed assets, financial statement lending was also significantly associated with higher likelihood of obtaining bank loans from state-owned banks for service small-sized enterprises other than hotels. Although this study also found financial statement lending to have a positive impact on the likelihood of access to capital obtained by hotel SMEs from private commercial banks, the relationship was not significant. These findings are consistent with the notion that SMEs subjected to external audits have better quality financial information, and as result, are more transparent than SMEs without auditing requirements (Van Caneghem & Van Campenhout, 2012).

On the contrary, financial statement lending was found to have a negative impact on loan size although the relationship was not statistically significant. The result suggests that although financial statement lending increases the likelihood of access to capital, it is associated with lower loan sizes compared to SMEs whose financial statements were not audited. This may be partially explained by country variations in the quality of auditing procedures (Ball, Kothari, & Robin, 2000). In addition, SMEs usually rely on independent accountants rather than accredited auditing firms as external auditors (Uchida, 2011). As a result, banks may not certify that SMEs are subjected to high quality auditing since external accounting procedures from unaccredited sources are likely to be unreliable. Another potential explanation for the negative association between financial statement lending and loan size may be related to either sufficient amount of assets pledged as collateral requirements, or the possible short-term nature of SME lending (Jiménez, Salas, & Saurina, 2006). For instance, the lower size of loan contracts that mature in the short-term may be the main reason these loans do not require either collateral guarantees, or revised external audits (Menkhoff, Neuberger, & Suwanaporn, 2006).
Hotel SMEs vs. Other Service SMEs

As expected, significant evidence suggests that larger and older SMEs are not only more likely to have access to capital, but these businesses also obtain greater loan values. This finding is consistent with other findings in the extant SMEs literature that point to both firm size and firm age as important determinants of access to capital in developing economies (Ayyagari et al., 2014; Beck, Demirgüç-Kunt, & Pería, 2010). The results also show that positive changes in the collateral value increase the loan amount for SMEs in the Brazilian service sector. Hotel SMEs incur higher increases than other service SMEs. Initially, this difference may exist since hotels are likely to provide greater collateral size due to their ability to provide fixed asset lending. However, the negative coefficients of the dummy variable representing fixed asset collateral suggest that SMEs using fixed asset lending have at least 20% lower loan size than other types of collateral. Since the coefficients for the interaction term between collateral value and fixed asset lending are positive, a potential explanation for the negative coefficient of the binary variable may be a low value of the fixed assets belonging to the SME service sector due to depreciation.

Another possible explanation for the negative coefficients of fixed asset business collateral suggests that both high transaction costs and inefficiencies in the Brazilian legal system, such as transferring property rights in case of loan default or weak contractual enforcements, may act as a disincentive for financial intermediaries to incur elevated levels of risk. In this environment of weak legal system, banks may rely on soft information, such as the duration of relationship with borrowers and interactions with multiple banks, to assess SME risk.

As a result, relationship lending, defined as lending decisions based on soft information and long-term relationships between lender and borrower (Thorsten Beck &
Demirguc-Kunt, 2006), may play a critical role in the Brazilian credit market. Under relationship lending, financial intermediaries primarily rely on collecting soft information over time with SME owners, suppliers, consumers and the communities in which SMEs are located. For SMEs lacking hard information, such as collateralized assets and credible financial statements, relationship lending, frequently used by opaque businesses to increase the likelihood of obtaining access to capital (Berger & Udell, 2006) may reduce information asymmetries between banks and SMEs (Boot, 2000). In middle-income countries where the availability of assets to be pledged as collateral is limited, such as Brazil, SMEs and banks often rely on relationship lending and the collection of soft information. Empirical evidence also suggests that the likelihood of collateralized loans decreases with the length of relationship between financial intermediaries and SMEs (Chakraborty & Hu, 2006; Steijvers, Voordeckers, & Vanhoof, 2010).

**State-Owned Banks vs. Private Commercial Banks**

The findings of this study also reveal that state-owned banks not only are more likely to lend to SMEs, but their loans also have greater value than private commercial banks in Brazil, confirming the notion that state-owned banks often have direct mandates to serve SMEs with limited access to capital from the private sector, providing below market interest rates. However, evidence suggesting the important role of state-owned banks in widening access to capital is mixed as best. On one hand, prior research indicates that state-owned banks are inefficient, are less likely to lend to SMEs (G. Clarke, Cull, Peria, & Sánchez, 2005) since they are usually associated with a higher proportion of nonperforming loans (Thorsten Beck, Demirgüç-Kunt, & Maksimovic, 2004). However, this does not necessarily contradict the main objectives of state-owned banks in developing economies as they are mandated to subsidize projects with negative present values.
On the other hand, state-owned banks are in better position to provide access to capital to SMEs since they have access to government funding through subsidies, and as a result, less likely to encounter situations of distress (Berger et al., 2008). Because state-owned banks are funded by government subsidies, they also have objectives other than profit maximization, such as developing specific industries or sectors, assistance to firms in rural areas and new firms, among other goals. In addition, state-owned banks may also be in a better position to collect soft information from SMEs since these firms are less likely to have reliable financial records (Chong, Lu, & Ongena, 2013). These findings are in conformity with the main results of this study, and depict the importance of state-owned banks in the widening of access to capital in emerging markets, such as Brazil.

*Sole Proprietor Ownership*

The study also found single proprietor ownership to be positively associated with the likelihood of obtaining access to capital. This result contradicts extant literature since prior work has suggested that single-owner SMEs are more likely to rely on internal financing (Newman, Borgia, & Deng, 2013; Schulze, Lubatkin, Dino, Schulze, & Dino, 2012), although evidence is mixed at best (Bopaiah, 1998; De Massis, Kotlar, Campopiano, & Cassia, 2015). Due to concentrated ownership, sole proprietors may experience less agency costs than SMEs with multiple owners since these costs arise from conflict between firm owners and management. Agency costs may be mitigated in SMEs with sole proprietors, where the owner is also part of management, reducing both information asymmetries and incentives for employees to engage in opportunistic behavior (Jensen & Meckling, 1976).

Conversely, this study found that single ownership is negatively associated with the size of loan contracts provided by private commercial banks, while it is positively associated for state-owned banks. Although not significant, the finding confirms the idea that single-
owner SMEs may be constrained by access to loan contracts in the short-term, explaining the lower amount given by private commercial banks (Chakravarty & Yilmazer, 2009; Heyman, Deloof, & Ooghe, 2008). In addition, single-owned SMEs may have access to lower collateral value than other ownerships. Banking financial institutions may find single-owned SMEs riskier than SMEs with other types of ownership since they are more likely to be informationally opaque (Berger et al., 2001). As a result, a potential explanation for this difference in the relationship between single ownership and loan size suggests that state-owned banks may be less sensitive to incurring the risks associated with lending to SMEs with concentrated ownership (Berger et al., 2008).

**Women-Owned SMEs**

Unlike ownership type, gender was found to have a significant negative impact on the probability of access to capital as the likelihood of obtaining bank loans from private commercial banks decreases for women-owned SMEs. The finding of this study is consistent with prior results suggesting that women are less likely to obtain financing from formal banking institutions (Aterido, Beck, & Iacovone, 2011), and rely more on informal or internal financing (Muravyev, Talavera, & Schafer, 2009). A potential explanation for the gender gap found in access to capital may be the lower financial literacy among women SME owners (Lusardi & Tufano, 2015), or facing discrimination in loan approval (Cavalluzzo, Cavalluzzo, & Wolken, 2002). In addition, lack of adequate access to capital for women-owned SMEs may also be explained by the concentration of these firms in lower performing industries, such as the service sector (Bardasi et al., 2011).

Although not significant, however, women-owned SMEs were found to be more likely to obtain bank loans from state-owned banks in Brazil. Other than the lower sensitivity to incur risks compared to private commercial banks, state-owned banks generally operate
with federal subsidies and have mandates to supply additional credit to underfunded groups, such as SMEs, low productivity industries and women entrepreneurs (Thorsten Beck et al., 2008). Significant evidence found in this study also suggests a positive impact of gender on loan size for both private and state-owned banks. The finding contradicts previous studies that reported access to smaller loan sizes to women entrepreneurs (Bardasi et al., 2011; Coleman, 2007). One explanation offered is the higher collateral costs for women entrepreneurs in Latin America. On one hand, this may indicate reluctance for women SME owners to apply for bank loans. On the other hand, however, women-owned SMEs that provide the necessary collateral requirements may be in a position to obtain higher loan amounts, implying that financing obstacles may have a greater dependence on industry and firm-related characteristics than gender effects (Constantinidis, Cornet, & Asandei, 2006).
Chapter 6: Conclusion

The main objective of the study was to investigate the impact of lending technologies on the likelihood of access to capital and the size of loan contracts for service SMEs in Brazil. More specifically, it focused on the comparison between hotel SMEs and other service SMEs since they are the fastest growing segment in the Brazilian service sector (WTTC, 2015). As SMEs comprise the bulk of economic activity in the Brazilian economy, understanding the underlining aspects of access to capital is an important issue since the high failure rate of SMEs is primarily attributed to the lack of access to capital (Cressy, 2006). In addition, greater access to capital markets is associated with SME growth in middle-income countries, such as Brazil (Franco & Haase, 2010). As a result, facilitating access to capital is a critical component for SME growth as firms excluded from capital markets may be constrained in their ability to expand their operations and incur improvements in performance.

One of the main contributions of this study is to test the theory of financial intermediation, emphasizing the potential role of lending technologies to screen out SMEs according to risk profile. In addition, there is an urgent need to depict different financing sources available for SMEs in the service sector in middle-income countries, particularly examining hotels, since they have different capital structure than SMEs in other sectors, such as manufacturing (i.e. high operational risk and demand uncertainty). For policymaking implications, this study also identifies particular actions that may increase service SMEs’ access to capital, such as having assets to use as collateral guarantees, and auditing financial statements.

The central findings of this study suggest that service SMEs that used fixed asset lending are more likely to obtain access to capital than firms without collateral, supporting
previous theoretical models and recent empirical work (Jiménez et al., 2006; Menkhoff, Neuberger, & Rungruxsirivorn, 2012). The findings also indicate that hotel SMEs are more likely to have access to capital. This is consistent with the notion that financial intermediaries may require hotels to pledge fixed asset lending in loan contracts in order to offset the industry’s high operational risk and demand volatility (Serrasqueiro & Nunes, 2014). The value of fixed asset lending was also found to have a significant positive impact in the size of loan contracts. In other words, for SMEs that obtained access to capital, a higher collateral value increases the size of the loan. This result is also intuitive since fixed assets may give financial intermediaries an additional guarantee in the provision of loan contracts, given the collateral value of these assets.

In addition, financial statement lending increased the probability of access to capital. This significant result indicates that service SMEs with externally audited financial statements were more likely to obtain access to capital than firms without external auditing procedures. This finding is also consistent with previous results that support the role of external auditing in the ability to signal low risk SME profiles to lenders (Uchida, 2011; Van Caneghem & Van Campenhout, 2012). Finally, service SMEs were more likely to obtain access to capital provided by state-owned banks than by private commercial banks in Brazil. State-owned banks were also found to provide SMEs with higher values of loan contracts. Although previous literature suggests that private commercial banks are more efficient than state-owned banks (Beck et al., 2008; Berger et al., 2008), the findings of this study may be indicative of the change in the structure of Brazilian state-owned banks in recent years. Not only are they required by law to invest a greater proportion to facilitate access to capital to SMEs, but state-owned banks have a much larger branch density than private-owned banks, reaching remote areas in Brazil (Beck, Crivelli, & Summerhill, 2005). As a result, state-owned banks had an important role in coordinating the widespread access to capital that
increased both SMEs’ ability to scale up their investments and the population’s consumption power in recent years.

Implications of the Study

This study has several implications for policymakers in Brazil. First, revealing the importance of using lending technologies to obtain access to capital separates by risk profile SMEs with access to the adequate loan mechanism tools from those without.

SME Finance Education

Since the Brazilian Institute for the Support of Micro and Small Firms (SEBRAE) aims to provide entrepreneurial skills by improving financial education, policymakers could incorporate the adequate use of lending technologies in their training programs. Educational programs could also be tailored according to the sector of operation. For instance, the service sector may be perceived as a homogenous sector of activity. However, different service industries, such as hotel, retail, IT, have different capital needs, and therefore, different ability to access capital markets. The findings of this study suggest that hotel SMEs are more likely to obtain loans than other SMEs in the service sector since they are better equipped to provide collateral guarantees. As a result, policymakers need to understand the capital needs of SMEs in different activity sectors in order to better advise them regarding the appropriate tools to use to enter the Brazilian credit market.

Understanding the Importance of Financial Statements

As an initial step, SME owners need to understand the process of organizing a financial statement within a homogeneous structure. This is a critical issue since financial statements from SMEs may be incomplete, not following a formal configuration. Consequently, the heterogeneous nature of SME financial statements may discourage banks from assessing the quality of SME projects.
Another important step regards the importance of regulating independent accountants in Brazil. SMEs may not have the financial capacity to acquire the services provided by multinational auditing firms, such as the Big Four (KPMG, Deloitte, PwC and Ernst & Young). As a result, SMEs may rely on having their financial statements audited by independent accountants. Since the quality of their audits may differ, banks may perceive the information resulted from the auditing procedure as unreliable. Through SEBRAE’s educational programs, another step towards increasing the likelihood of access to capital may be the provision of training to independent accountants aiming to produce the auditing procedures with similar quality as the ones assessed by banks.

The role of financial intermediaries in Brazil

A third implication of this study further concerns the role of financial intermediaries in the provision of access to capital in Brazil. The findings reveal the important role of state-owned banks in Brazil since they have mandates to supply additional credit to underfunded businesses. Private commercial banks are also critical to provide access to capital to SMEs and increase bank competition. It is suggested that greater bank competition between state-owned and private banks may be a strong determinant of access to capital in emerging economies (Beck et al., 2004; Berger et al., 2008). Policymakers may use the findings of this study to educate SME owners regarding the different needs of state-owned and private commercial banks such that SMEs may be guided towards actions that increase the likelihood of access to capital according to bank type. Although not the focus of this study, creating actions that strengthen alternative sources of formal financing, such as credit union cooperatives, community banks and other community development financial institutions (CDFIs), may not only increase bank competition, but it may also provide alternative sources of financing to SMEs. Therefore, policymakers, through SEBRAE, could expand their
training programs to educate SMEs about the expectations of different banking institutions, including CDFIs.

**Women-Owned SMEs**

Clearly, the issue of access to capital is not only directly affected by the ability to provide collateral guarantees and reliable audited financial statements to signal risk profile, but firm size, age, location, sector and ownership type as well as gender of the SME owner play an important role in determining access to capital. Women-owned SMEs have an important role in both achieving economic growth and gender empowerment. In addition, successful women-owned SMEs may have a positive impact in educational levels. In a recent study, Islam and Amin (2015) found strong evidence that developing countries with a higher proportion of women-owned SMEs and top women managers also have higher enrollment rates for women compared to men in primary, secondary and tertiary education. Since lack of adequate access to capital from private banking institutions is a key business concern for women-owned SMEs, an implication of this study points to national state-owned banks in Brazil to provide wider access to capital for women-owned SMEs. As a result, both the public and private sector to continue fostering the environment of women entrepreneurs in order to obtain economic development and gender empowerment.

In addition, exogenous factors may also exacerbate the problem of access to capital in Brazil, thus discouraging higher SME growth levels (Presbitero & Zazzaro, 2011). Among these factors, corruption, lack of adequate infrastructure, inefficiencies in both legal and financial systems and macroeconomic instability contribute to an environment that discourages SME access to capital. Countries with a less developed legal system are usually characterized by lack of adequate property rights, high firm entry and exit costs, lack of systematic contractual enforcements and rigid employment laws.
Exogenous Factors that Impact Access to Capital

Country-level issues may also affect access to capital, and therefore, SME growth. Ongena and Smith (2000) found that credit constraint is more common in countries with poor enforcement of property rights and inefficiencies in the judicial system. As a result, Brazilian private commercial banks might not be willing to provide SME loans due to minimizing the costs associated with going to court in case of loan default. There is also strong evidence to support association between lower shares of access to capital for SMEs in middle-income countries and worse protection of property rights, high costs of both registering property and enforcing contracts, and worse credit information (Beck, Demirgüç-Kunt, & Pería, 2010). Claessens and Laeven (2003) also found that SME growth and access to capital is disproportionately lower in countries with weak property rights, such as Brazil. Similar results suggest that better protection of property rights has a larger positive effect on SMEs access to capital due to its impact on the provision of bank loans (Beck et al., 2008).

High firm entry and exit costs may also undermine access to capital in middle-income countries. These costs not only act as a disincentive for firm creation (Klapper, Laeven, & Rajan, 2006), but they are also associated with difficulties in the access of capital since they involve higher costs of registering property, thus, increasing the obstacles to pledge collateral guarantees (Ayyagari et al., 2007). There is also enough evidence to suggest that reducing firm entry and exit costs and protecting property rights result in facilitated access to capital and a larger employment share in SMEs (Giné, 2011; Harrison, Lin, & Xu, 2014).

Lack of access to capital is also a critical mechanism that may contribute to persistent to greater income inequality. Financial market imperfections, such as information asymmetries and transaction costs, arise due to less-developed legal systems, limiting access to capital and playing an important role in the perpetuation of income inequality. Therefore,
financial sector reforms that encourage the promotion of broader access to financial services need to be at the forefront of development agendas in middle-income countries.

Evidence in the SME finance literature acknowledges a robust impact of financial development in both raising income of poor communities and reducing income inequality, although the income distribution depends on a country’s level of economic development (Beck, Demirgüç-Kunt, & Levine, 2007). Greenwood and Jovanovic (1990) also reveal a strong association between financial development and poverty alleviation in the developing world. This association is also found in more recent work (G. R. G. Clarke, Xu, & Zou, 2006; Greenwood, Sanchez, & Wang, 2013). In sum, greater financial development of middle-income countries accelerates SME growth, and induces the income of the poor to grow faster than the average per capita GDP growth, thus, lowering income inequality and contributing to poverty alleviation.

These institutional factors aforementioned create deterrents to wider access to capital by hindering legal and financial development, especially in the case of low to middle-income countries. Rajan and Zingales (1998) show that SME industries that are dependent on greater access to external financial services grow faster in countries with better developed financial systems. Conversely, SMEs are the most negatively affected in the absence of sound institutional framework. Compared to other emerging markets, Brazil has had relatively success in widening access to SME loans in the first decade of the 21st century (Feltrim, Ventura, & Dodl, 2009). Nevertheless, the country needs to keep strengthening its legal structure in order to increase SMEs’ competitiveness, and protect them from corruption.

Limitations of the Study

This study is bounded by several restrictions. Perhaps the most constraining limitation of this study is contained in its dataset, collected by the World Bank in 2010. This may pose
some concerns as the economic and political situation of Brazil has changed over the last years. The current economic and political instability may have serious effects in undermining recent advances, such as increased access to capital. Recent upsurges in both the interest rate and inflation may affect access to capital in Brazil by increasing the costs of investing, and lessening the availability of long-term finance. Consequently, caution should be exerted when analyzing the current economic situation as SMEs are likely to have higher constraints in obtaining access to capital due to increases in the cost of capital caused by an unstable macroeconomic environment.

Another important limitation is related to both the secondary and cross-sectional nature of the dataset. In the secondary data analysis, the author of this study did not have any control over purpose, choice and method of data collections. As data has also been collected at a single point in time, the study may have yielded different results if another timeframe had been selected. Collecting data of the same SMEs in a panel format is the next step to account for longitudinal variations. Moreover, the use of cross-sectional data makes it difficult to infer causality. This may pose as a problem since there are other factors that affect SME’s access to capital, such as location of the firm (municipality), presence of non-banking financing institutions (i.e. community banks and microfinance institutions), and owner’s schooling years. Consequently, concluding a causal relationship between lending technologies and SMEs’ access to capital would be misguided because causal inference cannot be computed in the data alone, or from the data distributions.

Since interest rates in Brazil are exorbitant, further constraining SMEs from obtaining access to capital, an important variable that is missing in the World Bank survey is perhaps the interest rate negotiated in the loan contracts. This variable would allow this study to test Bester’s (1985) self-selection mechanism design model, which argues that as financial intermediaries have a menu of contracts for both higher and lower risk borrowers, firms
(borrowers) would select a loan contract according to collateral requirements and interest rates, truthfully revealing their risk type. This analysis would complement the current study since banks may have different contracts depending on the borrower’s risk type. As a result, the absence of interest rate in the survey poses as a main limitation to extend testing the signaling role of lending technologies.

Furthermore, the World Bank Enterprise Survey did not include a series of other lending technologies, such as small business credit scoring (SBCS), referring to hard financial information about the SME’s owner, such as personal consumer data obtained from credit agencies (Berger & Udell, 2006), and relationship lending limiting the reach of this study. These technologies are also critical in aiding financial intermediaries in the assessment of borrowers’ risk by accurately predicting their probability of default. They provide an interesting path for future research since they serve as a complementary means of access to capital that may increase the quantity of credit extended to SMEs, and reach relatively informationally opaque and risky borrowers.

SBCS is usually applied to very opaque SMEs since it predicts the probability of borrower default by obtaining information based on the personal history of the business owner. Recent models suggest that this lending technology may be associated with increases in small business lending (Frame, Padhi, & Woosley, 2004), primarily for riskier firms that are likely to pay higher prices for credit (Berger, Frame, & Miller, 2005). SBCS also provides an interesting path for future research since it serves as an alternative means of access to capital that may increase the quantity of credit extended to SMEs, reaching relatively informationally opaque and risky borrowers.

Under relationship lending, furthermore, financial intermediaries primarily rely on soft information collected through continuous interaction over time with borrowers in order
to address problems associated with SME opacity (Berger & Udell, 2006). For instance, not only loan sizes tend to increase based on the duration of lender-borrower relationship, but borrowers (SMEs) are able to negotiate better loan contracts, such as collateral requirements and lower interest rates (Degryse & Cayseele, 2000). This current study partially addresses issues related to relationship banking through the provision of personal assets pledged as collateral requirements. Key elements of relationship lending were not included in the survey, such as loan maturity, the length of the lending relationship, the number of financial institutions SMEs borrow from, and the number of loan contracts SMEs simultaneously have (Harhoff & Körting, 1998). As result, assessing the impact of lending technologies on access to capital is further constrained by the absence of these variables.

A final limitation is related to the choice of test for overall significance of the logit model, Wald test. Alternatively, the study could have used the likelihood-ratio (LR) test since it is asymptotically equivalent to the Wald test if the model is correctly specified. An LR test is computed by comparing the log likelihood from a full model with the log likelihood from a restricted model (Hosmer & Lemeshow, 2013). Convention within the SME finance literature prefers to use the Wald test as it is the only test available for estimating robust standard errors (Riding et al., 2007; Voordeckers & Steijvers, 2006).

Future Research

Research on SME access to capital in emerging economies, particularly in Latin American countries, is limited. In the case of Brazil, the current economic situation may mitigate the positive effect of policies that helped increase access to capital in previous years. More specifically, SMEs may be discouraged to apply for new loans or lines of credit due to recent increases in both the interest rate and inflation, raising the cost of capital. Further, firms may find difficulty in renegotiating loan contracts, as financial intermediaries tend to
reduce the supply of credit in periods of macroeconomic instability (Hume & Sentance, 2009). As a result, a first broad step is to stabilize the macroeconomic environment, including taking the necessary steps to balance the country’s budget deficit, in order to encourage financial and economic development in the long-term.

SMEs have the potential to be the engine for future economic growth and development in Brazil. An important area of future investigation is SME labor productivity, a measure of firm efficiency, or in other words, how well a firm transforms its inputs into outputs and added value (Bloom, Mahajan, McKenzie, & Roberts, 2010). From a service sector perspective, the concept can be defined as cost management efficiency of service production resources and the perceived quality of its services (Grönroos & Ojasalo, 2004). Not only the service sector is an important part of the economy, but it has also been traditionally labor intensive. Since hotels are labor intensive, they are particularly vulnerable to pressure from workers for increases in wages even when no real productivity growth has occurred. Blois (1984) argues that lack of labor productivity may cause labor costs to increase more than prices, exacerbating the problem of inflation. Labor productivity is a key issue in Brazil as institutional factors related to corruption, lack of infrastructure, human capital, rigid regulations, and most importantly, lack of access to capital markets may reduce the efficiency of SMEs (Tybout, 2000).

Labor productivity may also explain the factors that contribute to lower growth and investment rates associated with SMEs in developing economies (Harrison et al., 2014). Understanding the relationship between access to capital and labor productivity is critical to create conditions that ensure that SMEs with growth potential can expand their operations and increase competitiveness. As a result, potential future research requires examining the impact of access to capital on SME labor productivity in the Brazilian service sector. This may be the starting point to develop strategies that focus on increasing productivity.
Market inefficiencies, such as information asymmetry between SMEs and financial intermediaries, may also discourage SMEs from applying for loan contracts. Kon and Storey (2003) define discouraged borrowers as potential applicants who avoid applying for external finance, such as bank loans, because they feel the application will be rejected. Firms in need of access to capital may choose not to apply due to several constraints, such as the complexity of loan application procedures, unattainable collateral requirements, high interest rates, and insufficient loan size and maturity, among others.

Understanding discouraged SMEs is important in the Brazilian context since a third of SMEs in Brazil are reported to be discouraged from applying to loan contracts (Feltrim et al., 2009). A potential area for research may be to examine the impact of institutional factors that act in detriment to SME growth on borrower discouragement. For instance, Crakravarty and Xiang (2013) found that firm age, firm size, level of firm competitiveness and the nature of the relationship between SMEs and financial intermediaries have a significant effect on the likelihood of firm discouragement from applying to loan contracts in emerging markets, such as Brazil. Additional research efforts are needed to understand the relationship between firm discouragement and institutional elements that affect the investment climate, such as corruption, lack of infrastructure, strict norms and regulations and macroeconomic policies.

In addition, the data availability for SME finance is still scarce in developing economies. Although the World Bank has provided extensive business climate data, future data collection efforts need to target the compilation of longitudinal datasets, particularly for SMEs in the service sector, since it comprises a large share of economic activity for low and middle-income countries. Increased panel data availability may assist in the investigation of high mortality rates of service SMEs in Brazil and other emerging markets. As a result, future research needs to examine the main determinants of the high firm mortality rates observed in Brazil, especially for new firms entering the market.
In the current scenario of limited access to capital markets in Brazil, high transaction costs and information asymmetries may exacerbate the mortality rate of SMEs in countries where the judicial system is less developed (Daskalakis & Psillaki, 2008). The supply of access to capital may decrease because of financial intermediaries’ unwillingness to lend due to high costs associated with legal inefficiencies, such as the uncertainty and time spent on court to obtain a fixed asset in case of SME loan default. This inability to increase the supply of access to capital may contribute to high levels of SME mortality rates in emerging markets. Hence, another plausible area of future research should take into account the relationship between access to capital and institutional obstacles, such as high firm entry and exit costs, lack of contractual enforcement and inefficiencies in the legal framework (i.e. lack of property rights protection), and how this relationship affects the survival of SMEs in the service sector.

Crime is another institutional component to be considered, since crime rates is found to have a positive association with income inequality (Ehrlich, 1973). Kelly (2000) also found that regions with denser cluster of crime events lack both investment opportunities and competitiveness of local businesses, thus, creating uncertainty and market inefficiencies. In addition, criminal activity may deteriorate formal and informal institutions, and as a result, it is likely to act as a major constraint for SME growth since crime increases the costs of doing business (Detotto & Otranto, 2010). This is an important area of investigation for Brazil since crime has large social and economic costs, amounting to an average of 4% of GDP per year (World Bank, 2006). Losses due to crime may also affect SME growth, as the impact of crime may be large in respect with the proportion of losses in total annual sales. Consequently, future studies should also consider the impact of crime on access to capital and SME productivity in different regions of Brazil.
Women-owned businesses may be more sensitive to crime as the costs of committing a crime may be lower for individuals who commit against female-owned businesses in low and middle-income countries (Islam, 2013). As a result, there appears to be a gender bias in crime against SMEs as the author found a positive relationship between firm losses due to crime and female ownership. Amin (2009b) also found that women-owned SMEs in Latin America are more likely to experience crime and have a higher proportion of losses in sales due to crime than male-owned firms. This is an important issue since women-owned SMEs have critical role for SME growth and economic development in Brazil, as they comprise the largest proportion of Brazilian SMES in the service sector (Bruhn, 2009). Hence, another potential future study should focus on gender effects regarding the impact of crime on access to capital and SME productivity.

Major research effort that targets the impact of institutional factors on service SMEs is clearly in its infancy in Brazil. Hence, there is an abounding environment for future research opportunities in order to investigate the role of SMEs in fomenting economic development and reducing income inequality in Brazil. Providing adequate financial development that facilitates access to capital and encourages SME growth is a focal issue in the creation of an environment that advances development at the local level.
References


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21. doi:10.1016/S0010-8804(02)80014-3


doi:10.1093/wber/7.1.65


doi:10.1017/S1474747215000232


doi:10.1016/j.worlddev.2004.01.008


Appendix

Table 1: Definition of Small and Medium Enterprises (IBGE, 2003)

<table>
<thead>
<tr>
<th>Service and Retail Sector</th>
<th>Micro firms</th>
<th>Up to 9 employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Firms</td>
<td></td>
<td>10 to 49 employees</td>
</tr>
<tr>
<td>Medium Firms</td>
<td></td>
<td>50 to 99 employees</td>
</tr>
<tr>
<td>Large Firms</td>
<td></td>
<td>Over 100 employees</td>
</tr>
</tbody>
</table>

Table 2 – Size of national economy in terms of Gross National Income (in 2014 US dollars)

<table>
<thead>
<tr>
<th>Very Small Countries</th>
<th>Less than $15 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Countries</td>
<td>$15 billion to $100 billion</td>
</tr>
<tr>
<td>Medium Size Countries</td>
<td>$100 billion to $500 billion</td>
</tr>
<tr>
<td>Large Countries</td>
<td>More than $500 billion</td>
</tr>
</tbody>
</table>
| Type of financial intermediary | H1 | The size of collateral will affect access to capital of service SMEs (including hotel SMEs) in Brazil:  
  H1a: Personal collateral and fixed asset lending will have a higher impact on access to capital than fixed asset lending alone.  
  H1b: Personal collateral and fixed asset lending will have a higher impact on the size of loan contracts than fixed asset lending alone  
| Personal collateral | H2 | Hotel SMEs will be more likely to have access to capital than other service SMEs in Brazil.  
| Fixed-asset lending | H3 | Financial statement lending will have a greater influence for hotels than for other service SMEs in Brazil:  
  H3a: On access to capital  
  H3b: On the size of loan contracts  
| Financial statement lending | H4 | State-owned banks will have a greater influence than private commercial banks:  
  H4a: On providing access to capital  
  H4b: On the size of loan contracts  
| Type of financial intermediary |
Table 4: Description of Variables

| Outcome Variables | Loan | \( \text{loan}_i = \begin{cases} 1, & \text{if the } i \text{-th SME currently has a bank loan} \\ 0, & \text{otherwise} \end{cases} \)  
| Loan size | Log-transformed size of the loan contract. |
| Explanatory Variables | Collateral Value | Log-transformed size of total value of collateral |
| | Fixed-asset lending | \( \text{FA Collateral}_i = \begin{cases} 1, & \text{if fixed assets collateral only} \\ 0, & \text{otherwise} \end{cases} \) |
| | Fixed-asset and personal collateral | \( \text{Personal collateral}_i = \begin{cases} 1, & \text{if both personal and fixed asset collateral} \\ 0, & \text{otherwise} \end{cases} \) |
| | Financial statement lending | \( \text{FS lending}_i = \begin{cases} 1, & \text{if FS revised by external auditor} \\ 0, & \text{otherwise} \end{cases} \) |
| Control Variables | Firm Age | Number of years a SME has been in business (log-transformed) |
| | Firm Size | Number of employees (log-transformed) |
| | SME Ownership | \( \text{SME Proprietor}_i = \begin{cases} 1, & \text{SME sole proprietorship} \\ 0, & \text{otherwise} \end{cases} \) |
| | Hotel | \( \text{hotel}_i = \begin{cases} 1, & \text{if the } i \text{-th SME is a hotel} \\ 0, & \text{other service SMEs} \end{cases} \) |
| | Bank | \( \text{bank}_i = \begin{cases} 1, & \text{if banks are state-owned} \\ 0, & \text{private commercial banks} \end{cases} \) |
| | Owner’s Gender | \( \text{gender}_i = \begin{cases} 1, & \text{female} \\ 0, & \text{male} \end{cases} \) |
Table 5: Descriptive Statistics Small Medium-Sized Enterprises in the Service Sector

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>St. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan Value (USD)</td>
<td>$215,788.80</td>
<td>$581,738.10</td>
</tr>
<tr>
<td>Collateral Value (USD)</td>
<td>$174,500.20</td>
<td>$303,250.30</td>
</tr>
<tr>
<td>Firm Age (Years)</td>
<td>15.62</td>
<td>10.20</td>
</tr>
<tr>
<td>Firm Size (# Employees)</td>
<td>29.54</td>
<td>20.15</td>
</tr>
</tbody>
</table>

Table 6: Logit Models with Interaction Terms

<table>
<thead>
<tr>
<th>Model</th>
<th>Log collateral</th>
<th>FA collateral</th>
<th>Pers. col + FA</th>
<th>FS lending</th>
<th>Hotel</th>
<th>S. proprietor</th>
<th>Log firm size</th>
<th>Log firm age</th>
<th>State bank</th>
<th>Experience</th>
<th>Gender</th>
<th>Logcol*FAcol</th>
<th>Logcol*PFAcol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>1.005 (0.0774)</td>
<td>2.286** (0.826)</td>
<td>0.745 (0.316)</td>
<td>1.198 (0.540)</td>
<td>2.527* (1.421)</td>
<td>6.472* (6.714)</td>
<td>1.746*** (0.324)</td>
<td>1.557 (0.427)</td>
<td>1.067 (0.426)</td>
<td>0.984 (0.0180)</td>
<td>0.686 (0.345)</td>
<td>0.993 (0.0636)</td>
<td>0.976 (0.142)</td>
</tr>
<tr>
<td>Model 2</td>
<td>1.010 (0.0862)</td>
<td>2.423 (1.552)</td>
<td>0.776 (0.422)</td>
<td>1.191 (0.534)</td>
<td>2.514 (1.414)</td>
<td>6.497* (6.840)</td>
<td>1.742*** (0.321)</td>
<td>1.553 (0.427)</td>
<td>1.063 (0.426)</td>
<td>0.984 (0.0180)</td>
<td>0.689 (0.347)</td>
<td>0.993 (0.0636)</td>
<td>0.976 (0.142)</td>
</tr>
<tr>
<td>Model 3</td>
<td>1.012 (0.0887)</td>
<td>2.294** (0.829)</td>
<td>0.965 (1.623)</td>
<td>1.190 (0.536)</td>
<td>2.531 (1.432)</td>
<td>6.469* (6.725)</td>
<td>1.745*** (0.324)</td>
<td>1.556 (0.427)</td>
<td>1.059 (0.428)</td>
<td>0.984 (0.0180)</td>
<td>0.685 (0.343)</td>
<td>0.993 (0.0636)</td>
<td>0.976 (0.142)</td>
</tr>
</tbody>
</table>

N = 248

<table>
<thead>
<tr>
<th></th>
<th>Pseudo R²</th>
<th>Wald $\chi^2$</th>
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<tbody>
<tr>
<td>Model 1</td>
<td>0.1365</td>
<td>28.55***</td>
</tr>
<tr>
<td>Model 2</td>
<td>0.1366</td>
<td>30.15***</td>
</tr>
<tr>
<td>Model 3</td>
<td>0.1366</td>
<td>28.70***</td>
</tr>
</tbody>
</table>

* p<0.10, ** p<0.05, *** p<0.01
Dependent variable: Access to Capital (Loan)
Exponentiated coefficients (Odds ratio)
Robust standard errors in parentheses

Table 7: OLS Models with Interaction Terms

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Log collateral</td>
<td>FA collateral</td>
<td>Pers. col + FA</td>
</tr>
<tr>
<td></td>
<td>0.831***</td>
<td>-0.191*</td>
<td>-0.0185</td>
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<tr>
<td></td>
<td>(0.0240)</td>
<td>(0.105)</td>
<td>(0.115)</td>
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<tr>
<td></td>
<td>0.813***</td>
<td>-0.446**</td>
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<tr>
<td></td>
<td>(0.0271)</td>
<td>(0.211)</td>
<td>(0.139)</td>
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<tr>
<td></td>
<td>0.810***</td>
<td>-0.199*</td>
<td>-0.966*</td>
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<tr>
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<td>(0.0261)</td>
<td>(0.105)</td>
<td>(0.509)</td>
</tr>
<tr>
<td></td>
<td>0.810***</td>
<td>-0.0105</td>
<td>-0.00501</td>
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<td></td>
<td>(0.108)</td>
<td>(0.109)</td>
<td>(0.108)</td>
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<td></td>
<td>0.114</td>
<td>0.135</td>
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<td></td>
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<td>(0.129)</td>
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<td>(0.157)</td>
<td>(0.150)</td>
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<td>0.179***</td>
<td>0.180***</td>
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<td>(0.0390)</td>
<td>(0.0388)</td>
<td>(0.0387)</td>
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<tr>
<td></td>
<td>0.129*</td>
<td>0.134*</td>
<td>0.131*</td>
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<td>(0.0715)</td>
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<td>(0.00393)</td>
<td>(0.00377)</td>
</tr>
<tr>
<td></td>
<td>0.273**</td>
<td>0.264**</td>
<td>0.280**</td>
</tr>
<tr>
<td></td>
<td>(0.115)</td>
<td>(0.115)</td>
<td>(0.116)</td>
</tr>
<tr>
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<td>0.0278</td>
<td>0.0278</td>
<td>0.0278</td>
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<tr>
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<td>(0.0169)</td>
<td>(0.0169)</td>
<td>(0.0169)</td>
</tr>
<tr>
<td></td>
<td>0.979***</td>
<td>1.139***</td>
<td>1.184***</td>
</tr>
<tr>
<td></td>
<td>(0.310)</td>
<td>(0.323)</td>
<td>(0.322)</td>
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<tr>
<td></td>
<td>0.0868**</td>
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<td>(0.0437)</td>
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<tr>
<td></td>
<td>N = 248</td>
<td>N = 248</td>
<td>N = 248</td>
</tr>
<tr>
<td></td>
<td>R² = 0.928</td>
<td>R² = 0.931</td>
<td>R² = 0.929</td>
</tr>
<tr>
<td></td>
<td>F = 288.48***</td>
<td>F = 288.42***</td>
<td>F = 279.66***</td>
</tr>
</tbody>
</table>

* p<0.10, ** p<0.05, *** p<0.01
Dependent variable: Log Loan Size
Robust standard errors
<table>
<thead>
<tr>
<th>SME Service Sector</th>
<th>Type of Financial Intermediary</th>
<th>SME Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hotel SMEs</td>
<td>Other Service SMEs</td>
</tr>
<tr>
<td>Log collateral</td>
<td>1.161</td>
<td>1.034</td>
</tr>
<tr>
<td></td>
<td>(0.145)</td>
<td>(0.0320)</td>
</tr>
<tr>
<td>FA collateral</td>
<td>2.872*</td>
<td>1.273</td>
</tr>
<tr>
<td></td>
<td>(1.622)</td>
<td>(0.238)</td>
</tr>
<tr>
<td>Pers. col + FA</td>
<td>0.238**</td>
<td>0.866</td>
</tr>
<tr>
<td></td>
<td>(0.157)</td>
<td>(0.186)</td>
</tr>
<tr>
<td>FS lending</td>
<td>1.510</td>
<td>1.679***</td>
</tr>
<tr>
<td></td>
<td>(0.618)</td>
<td>(0.337)</td>
</tr>
<tr>
<td>Hotel</td>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>Experience</td>
<td>0.998</td>
<td>0.994</td>
</tr>
<tr>
<td></td>
<td>(0.0221)</td>
<td>(0.00725)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.930</td>
<td>1.064</td>
</tr>
<tr>
<td></td>
<td>(0.685)</td>
<td>(0.244)</td>
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<td>Log firm age</td>
<td>1.790*</td>
<td>1.270***</td>
</tr>
<tr>
<td></td>
<td>(0.602)</td>
<td>(0.156)</td>
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<td>State bank</td>
<td>1.175</td>
<td>1.047</td>
</tr>
<tr>
<td></td>
<td>(0.630)</td>
<td>(0.186)</td>
</tr>
<tr>
<td>Log firm size</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>53</td>
<td>216</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.1964</td>
<td>0.0470</td>
</tr>
<tr>
<td>Wald χ²</td>
<td>11.14</td>
<td>20.16**</td>
</tr>
</tbody>
</table>

* p<0.10, ** p<0.05, *** p<0.01
Dependent variable: Access to Capital (Loan)
Exponentiated coefficients (Odds ratio)
Robust standard errors in parentheses
Table 9: OLS Models - Hotel SMEs vs. Other SMEs in the Service Sector

<table>
<thead>
<tr>
<th></th>
<th>Hotel Small and Medium-Sized Enterprises</th>
<th>Other SMEs in the Service Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Log collateral</td>
<td>0.854***</td>
<td>0.807***</td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(0.149)</td>
</tr>
<tr>
<td>FA collateral</td>
<td>-0.0262</td>
<td>-1.714</td>
</tr>
<tr>
<td></td>
<td>(0.292)</td>
<td>(1.815)</td>
</tr>
<tr>
<td>Pers. col + FA</td>
<td>-0.0843</td>
<td>0.0147</td>
</tr>
<tr>
<td></td>
<td>(0.447)</td>
<td>(0.409)</td>
</tr>
<tr>
<td>FS lending</td>
<td>-0.127</td>
<td>-0.136</td>
</tr>
<tr>
<td></td>
<td>(0.300)</td>
<td>(0.267)</td>
</tr>
<tr>
<td>S. proprietor</td>
<td>0.709</td>
<td>0.607</td>
</tr>
<tr>
<td></td>
<td>(0.708)</td>
<td>(0.779)</td>
</tr>
<tr>
<td>Log firm size</td>
<td>0.257**</td>
<td>0.254**</td>
</tr>
<tr>
<td></td>
<td>(0.113)</td>
<td>(0.110)</td>
</tr>
<tr>
<td>Log firm age</td>
<td>0.0203</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>(0.248)</td>
<td>(0.250)</td>
</tr>
<tr>
<td>State bank</td>
<td>0.148</td>
<td>0.220</td>
</tr>
<tr>
<td></td>
<td>(0.408)</td>
<td>(0.370)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.00215</td>
<td>0.000813</td>
</tr>
<tr>
<td></td>
<td>(0.0112)</td>
<td>(0.0109)</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.181</td>
<td>-0.128</td>
</tr>
<tr>
<td></td>
<td>(0.335)</td>
<td>(0.325)</td>
</tr>
<tr>
<td>Logcol*FAcol</td>
<td>0.147</td>
<td>0.128**</td>
</tr>
<tr>
<td></td>
<td>(0.150)</td>
<td>(0.0380)</td>
</tr>
<tr>
<td>Logcol*PFAcol</td>
<td>0.396*</td>
<td>0.0848*</td>
</tr>
<tr>
<td></td>
<td>(0.200)</td>
<td>(0.0456)</td>
</tr>
<tr>
<td>_cons</td>
<td>1.439</td>
<td>1.697</td>
</tr>
<tr>
<td></td>
<td>(1.339)</td>
<td>(1.515)</td>
</tr>
<tr>
<td>N</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>R²</td>
<td>0.933</td>
<td>0.937</td>
</tr>
<tr>
<td>F</td>
<td>23.49***</td>
<td>31.28***</td>
</tr>
</tbody>
</table>

* p<0.10, ** p<0.05, *** p<0.01
Dependent variable: Log Loan Size
Robust standard errors
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log collateral</td>
<td>0.808***</td>
<td>0.701***</td>
<td>0.757***</td>
<td>0.848***</td>
<td>0.806***</td>
<td>0.846***</td>
</tr>
<tr>
<td></td>
<td>(0.0338)</td>
<td>(0.0644)</td>
<td>(0.0360)</td>
<td>(0.0301)</td>
<td>(0.0428)</td>
<td>(0.0319)</td>
</tr>
<tr>
<td>FA collateral</td>
<td>-0.547**</td>
<td>-2.148**</td>
<td>-0.523**</td>
<td>-0.0537</td>
<td>-0.949*</td>
<td>-0.0577</td>
</tr>
<tr>
<td></td>
<td>(0.241)</td>
<td>(0.884)</td>
<td>(0.226)</td>
<td>(0.127)</td>
<td>(0.568)</td>
<td>(0.128)</td>
</tr>
<tr>
<td>Pers. col + FA</td>
<td>-0.135</td>
<td>-0.0712</td>
<td>-1.508**</td>
<td>0.225</td>
<td>0.209</td>
<td>-0.0385</td>
</tr>
<tr>
<td></td>
<td>(0.206)</td>
<td>(0.197)</td>
<td>(0.731)</td>
<td>(0.153)</td>
<td>(0.152)</td>
<td>(0.572)</td>
</tr>
<tr>
<td>FS lending</td>
<td>-0.0432</td>
<td>-0.0601</td>
<td>-0.00570</td>
<td>0.0574</td>
<td>0.0665</td>
<td>0.0562</td>
</tr>
<tr>
<td></td>
<td>(0.204)</td>
<td>(0.193)</td>
<td>(0.206)</td>
<td>(0.126)</td>
<td>(0.126)</td>
<td>(0.126)</td>
</tr>
<tr>
<td>Hotel</td>
<td>0.219</td>
<td>0.270</td>
<td>0.290</td>
<td>0.0376</td>
<td>0.0242</td>
<td>0.0381</td>
</tr>
<tr>
<td></td>
<td>(0.350)</td>
<td>(0.324)</td>
<td>(0.335)</td>
<td>(0.143)</td>
<td>(0.145)</td>
<td>(0.144)</td>
</tr>
<tr>
<td>S. proprietor</td>
<td>0.126</td>
<td>0.0734</td>
<td>0.0631</td>
<td>-0.237</td>
<td>-0.214</td>
<td>-0.231</td>
</tr>
<tr>
<td></td>
<td>(0.233)</td>
<td>(0.235)</td>
<td>(0.217)</td>
<td>(0.209)</td>
<td>(0.211)</td>
<td>(0.209)</td>
</tr>
<tr>
<td>Log firm size</td>
<td>0.224***</td>
<td>0.213***</td>
<td>0.234***</td>
<td>0.135***</td>
<td>0.136***</td>
<td>0.135***</td>
</tr>
<tr>
<td></td>
<td>(0.0641)</td>
<td>(0.0671)</td>
<td>(0.0669)</td>
<td>(0.0460)</td>
<td>(0.0445)</td>
<td>(0.0461)</td>
</tr>
<tr>
<td>Log firm age</td>
<td>0.289**</td>
<td>0.303***</td>
<td>0.331***</td>
<td>0.0667</td>
<td>0.0716</td>
<td>0.0649</td>
</tr>
<tr>
<td></td>
<td>(0.128)</td>
<td>(0.110)</td>
<td>(0.116)</td>
<td>(0.0821)</td>
<td>(0.0815)</td>
<td>(0.0826)</td>
</tr>
<tr>
<td>Experience</td>
<td>-0.00565</td>
<td>-0.00746</td>
<td>-0.00926</td>
<td>-0.000331</td>
<td>-0.000615</td>
<td>-0.000366</td>
</tr>
<tr>
<td></td>
<td>(0.00855)</td>
<td>(0.00845)</td>
<td>(0.00820)</td>
<td>(0.00394)</td>
<td>(0.00400)</td>
<td>(0.00394)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.239</td>
<td>0.188</td>
<td>0.225</td>
<td>0.232*</td>
<td>0.264*</td>
<td>0.234*</td>
</tr>
<tr>
<td></td>
<td>(0.286)</td>
<td>(0.257)</td>
<td>(0.271)</td>
<td>(0.129)</td>
<td>(0.136)</td>
<td>(0.131)</td>
</tr>
<tr>
<td>Logcol*FAcol</td>
<td>0.147**</td>
<td></td>
<td></td>
<td></td>
<td>0.0764*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0709)</td>
<td></td>
<td></td>
<td></td>
<td>(0.0432)</td>
<td></td>
</tr>
<tr>
<td>Logcol*PFAcol</td>
<td></td>
<td>0.135**</td>
<td></td>
<td></td>
<td></td>
<td>0.0228</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0624)</td>
<td></td>
<td></td>
<td></td>
<td>(0.0497)</td>
</tr>
<tr>
<td>_cons</td>
<td>1.025</td>
<td>2.310**</td>
<td>1.509**</td>
<td>1.040***</td>
<td>1.481***</td>
<td>1.078***</td>
</tr>
<tr>
<td></td>
<td>(0.665)</td>
<td>(0.945)</td>
<td>(0.692)</td>
<td>(0.364)</td>
<td>(0.434)</td>
<td>(0.382)</td>
</tr>
<tr>
<td>N</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>167</td>
<td>167</td>
<td>167</td>
</tr>
<tr>
<td>R²</td>
<td>0.933</td>
<td>0.937</td>
<td>0.937</td>
<td>0.929</td>
<td>0.931</td>
<td>0.929</td>
</tr>
<tr>
<td>F</td>
<td>123.67***</td>
<td>109.53***</td>
<td>131.73***</td>
<td>267.17***</td>
<td>243.56***</td>
<td>243.77***</td>
</tr>
</tbody>
</table>

Dependent variable: Log Loan Size
Robust standard errors

* p<0.10, ** p<0.05, *** p<0.01
Table 11: Hypotheses’ Results

<table>
<thead>
<tr>
<th>Type of financial intermediary</th>
<th>H1</th>
<th>The size of collateral will affect access to capital of service SMEs (including hotel SMEs) in Brazil:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>H1a: Personal collateral and fixed asset lending will have a higher impact on access to capital than fixed asset lending alone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H1b: Personal collateral and fixed asset lending will have a higher impact on the size of loan contracts than fixed asset lending alone</td>
</tr>
<tr>
<td></td>
<td>H1a</td>
<td>Not Supported</td>
</tr>
<tr>
<td></td>
<td>H1b</td>
<td>Supported</td>
</tr>
</tbody>
</table>

|                               | H2 | Hotel SMEs will be more likely to have access to capital than other service SMEs in Brazil. |
|                               |    | Financial statement lending will have a greater influence for hotels than for other service SMEs in Brazil: |
|                               |    | H3a: On access to capital |
|                               |    | H3b: On the size of loan contracts |
|                               | H3a | Not Supported |
|                               | H3b | Not Supported |

|                               | H4 | State-owned banks will have a greater influence than private commercial banks: |
|                               |    | H4a: On providing access to capital |
|                               |    | H4b: On the size of loan contracts |
|                               | H4a | Partially Supported |
|                               | H4b | Supported |
K. FINANCE

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:
I would like to ask you a few questions about how you finance the operations of this establishment.

K.1 In fiscal year 2007, what percent, as a proportion of the value of total annual purchases of material inputs or services, were:

| Paid for before the delivery? | k1a % |
| Paid for on delivery?         | k1b % |
| Paid for after delivery?      | k1c % |

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100%

K.2 In fiscal year 2007, what percent of this establishment's total annual sales of its goods or services were:

| Paid for before the delivery? | k2a % |
| Paid for on delivery?         | k2b % |
| Paid for after delivery?      | k2c % |

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100%

K.3 Over fiscal year 2007, please estimate the proportion of this establishment’s working capital that was financed from each of the following sources?

| Internal funds/Retained earnings | k3a % |
| Borrowed from banks (private and state-owned) | k3bc % |
| Borrowed from non-bank financial institutions | k3e % |
| Purchases on credit from suppliers and advances from customers | k3f % |
| Other (moneylenders, friends, relatives, etc.) | k3hd % |

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100%
K.4 In fiscal year 2007, did this establishment purchase fixed assets, such as machinery, vehicles, equipment, land, buildings, improvements to leaseholds or owned properties?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know</td>
<td>-9</td>
</tr>
</tbody>
</table>

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100%

K.6 Now let’s talk about the establishment’s current position. At this time, does this establishment have a checking and/or saving account?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don’t know</td>
<td>-9</td>
</tr>
</tbody>
</table>

LCUs

Machinery, vehicles and equipment (new and/or used) n5a
Land and buildings n5b

N.5 In fiscal year 2007, how much did this establishment spend on purchases of:

K.5 Over fiscal year 2007, please estimate the proportion of this establishment’s purchase of fixed assets that was financed from each of the following sources?

<table>
<thead>
<tr>
<th>Internal funds/Retained earnings</th>
<th>k5a %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners’ contribution or issued new equity shares</td>
<td>k5i %</td>
</tr>
<tr>
<td>Borrowed from banks (private and state-owned)</td>
<td>k5bc %</td>
</tr>
<tr>
<td>Borrowed from non-bank financial institutions</td>
<td>k5e %</td>
</tr>
<tr>
<td>Purchases on credit from suppliers and advances from customers</td>
<td>k5f %</td>
</tr>
<tr>
<td>Other (moneylenders, friends, relatives, etc)</td>
<td>k5hdj</td>
</tr>
</tbody>
</table>

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100%
**K.7** At this time, does this establishment have an overdraft facility?

| Yes | 1 |
| No  | 2 |
| Don't know | 9 |

**K.8** At this time, does this establishment have a line of credit or loan from a financial institution?

| Yes | 1 |
| No  | 2 |
| Don't know | 9 |

**K.9** Referring to the most recent line of credit or loan what type of financial institution granted this loan?

| Private commercial banks | 1 |
| State-owned banks and/or government agency | 2 |
| Non-bank financial institutions which include microfinance institutions, credit cooperatives, credit unions, or finance | 3 |
| Other | 4 |

**K.11** Referring only to this most recent line of credit or loan, what was the value at the time of approval?

| Size of most recent loan/line of credit approved | LCU(s) |
| Refuses to respond | -8 |

**K.13** Referring only to this most recent line of credit or loan, did the financing require collateral?

| Yes | 1 |
| No  | 2 |
| Don't know | 9 |
**K.14** Referring only to this most recent line of credit or loan, what type of collateral was required?

<table>
<thead>
<tr>
<th>Collateral</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land, buildings</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Machinery and equipment including movables</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Accounts receivable and inventories</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Personal assets of owner (house etc.)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Collateral not included in categories above</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**K.15** Referring only to this most recent line of credit or loan, what was the approximate value of the collateral required as a percentage of the loan value or the value of the line of credit?

<table>
<thead>
<tr>
<th>Percent</th>
<th>Value of collateral as percent of loan/line of credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>k15</td>
<td></td>
</tr>
</tbody>
</table>

**K.16** Referring again to the last fiscal year 2007, did this establishment apply for any loans or lines of credit?

<table>
<thead>
<tr>
<th>Yes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Don't know</td>
<td>-9</td>
</tr>
</tbody>
</table>

**K.17** What was the main reason why this establishment did not apply for line of credit or loan in fiscal year 2007?

<table>
<thead>
<tr>
<th>Reason</th>
<th>k17</th>
</tr>
</thead>
<tbody>
<tr>
<td>No need for a loan – establishment has sufficient capital</td>
<td>1</td>
</tr>
<tr>
<td>Application procedures for loans or line of credit are complex</td>
<td>2</td>
</tr>
<tr>
<td>Interest rates are not favorable</td>
<td>3</td>
</tr>
<tr>
<td>Collateral requirements for loans or line of credit are unattainable</td>
<td>4</td>
</tr>
<tr>
<td>Size of loan and maturity are insufficient</td>
<td>5</td>
</tr>
<tr>
<td>Did not think it would be approved</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
</tr>
<tr>
<td>K.18</td>
<td>In fiscal year 2007, did this establishment apply for new loans or new lines of credit that were rejected?</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Don't know</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K.19</th>
<th>How many of those loan or line of credit applications were rejected?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loan applications rejected</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K.21</th>
<th>In fiscal year 2007, did this establishment have its annual financial statement checked and certified by an external auditor?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Don't know</td>
</tr>
</tbody>
</table>
Victor Eduardo da Motta

Education

Ph.D.  Hospitality Management  PSU  2016
Area of Concentration: Finance; Minor in Applied Statistics

MPS  Community and Economic Development  PSU  2015

B.S.  Mathematics  King University  2004

B.A.  Economics  King University  2004

Published Articles in Peer-Reviewed Academic Journals


Working Papers

Motta, V. Network Cohesion, Social Capital and Microfinance in Rural India. *World Development*
