An Empirical Analysis of SME Finance in Turkey: Identifying the Macroeconomic and Firm Specific Factors Affecting SMEs' Access to Finance

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ABSTRACT

This thesis provides an empirical analysis of SMEs' access to financial services and credit in Turkey. It identifies the macroeconomic factors that affect banks' credit supply decisions to SMEs, and the firm-specific factors that determine SMEs' demand for bank credit and financial services. The macroeconomic, i.e. the supply-side analysis confirmed the conceptual hypothesis that banks' lending to SMEs is fuelled by economic growth and stability, financial market efficiency and banking competition, but hampered by the extent of government borrowing from domestic creditors. The firm-level analysis provided evidence that in recent years, SMEs in Turkey found it easier to access bank loans. Evidently, according to the 2015 WBES survey in Turkey, the rejection rate for bank credit was as low as 7% and only 16% of SMEs had cited access to credit as a major obstacle. Although these statistics are valid for the whole Turkish economy, this research discovered that there are significant regional discrepancies in the usage of credit and non-credit financial services in Turkey. In less developed regions, only a small percentage of SMEs have bank accounts, and use bank credit for financing working capital. Yet, it is also found that in these regions, SMEs mostly rely on bank loans for financing their fixed assets. Regarding to firm specific factors it is found that SMEs' size, operating performance as well as business ownership type and managerial competency (e.g. education level, business experience) are significant determinants for the demand for formal financial services in Turkey.

Keywords: SME finance, credit supply, credit demand, macroeconomic factors, firm's specific factors, OLS & GLMs regression.

ÖZ

Bu tez, Türkiye'de KOBİ'lerin finansal hizmetlere ve kredilere erişiminin ampirik bir analizini sunmaktadır. Bankaların KOBİ'lere kredi tedarik kararlarını etkileyen makroekonomik faktörleri ve KOBİ'lerin banka kredisi ve finansal hizmetler için talebini belirleyen firmalara özgü faktörleri belirler. Makroekonomik, yani arz-taraf analizi, bankaların KOBİ'lere borç vermesinin ekonomik büyüme ve istikrar, finansal piyasa etkinliği ve rekabet gücü ile körüklendiği, fakat devletin iç borçlanması ile zayıflatıldığını göstermiştir. Öte yandan, firma düzeyinde yaptığımız analiz, son yıllarda, Türkiye'deki KOBİ'lerin banka kredilerine daha kolay eriştiğini kanıtlamıştır. Açıkça, 2015 yılında yapılan WBES anketine göre banka kredisi için red oranı% 7 gibi düşük bir orana sahipti ve KOBİ'lerin sadece% 16'sı kredi erişimini önemli bir engel olarak göstermişti. Bu istatistikler tüm Türkiye ekonomisi için geçerli olmakla birlikte, bu araştırma Türkiye'de kredi ve kredi dışı finansal hizmetlerin kullanımında önemli bölgesel farklılıklar olduğunu ortaya çıkarmıştır. Daha az gelişmiş bölgelerde, KOBİ'lerin sadece çok küçük bir yüzdesi banka hesaplarına sahiptir ve işletme sermayesini finanse etmek için banka kredisi kullanmaktadır. Yine de, bu bölgelerde KOBİ'lerin çoğunlukla sabit varlıklarını finanse etmek için banka kredilerine başvurdukları da görülmektedir. KOBİ'lerin krediye erişiminde sirkete özgü faktörlere bakarsak, KOBİ'lerin performansının yanı sıra KOBİ sahiplerinin eğitim seviyesi ve yönetim yeterliliğinin Türkiye'deki banka kredilerine ve finansal hizmetlere olan talebin önemli belirleyicileri olduğu görülmektedir.

Anahtar Kelimeler: KOBİ finansmanı, kredi arzı, kredi talebi, makroekonomik faktörler, firmanın spesifik faktörleri, OLS ve GLMs regresyonu.

To my family and to the memory of my late father

With eternal love and gratitude

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PREFACE

A version of the macroeconomic (supply-side) analysis of this thesis has been published as Jenkins, H. and Hossain, M. (2017). An Analysis of the Macroeconomic Conditions Required for SME Lending: Evidence from Turkey and Other Emerging Market Countries. *Panoeconomicus*, 64(1): 77-92. doi: 10.2298/PAN140213008J. Also major finding of the firm level analyses has been presented at the 3rd International Conference on Banking and Finance Perspectives"(ICBFP). 25-27 April 2018, Famagusta, North Cyprus.

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LIST OF ABBREVIATIONS

ABSC	Access to Banks' Services and Credit
ATM	Automated Teller Machine
BD	Bank Debt
BIS	Department for Business, Innovation and Skills (UK)
BRSA	Banking Regulation and Supervision Agency
CAPM	Capital Assets Pricing Model
CPI	Consumer Price Index
CR	Concentration Ratio/Market Concentration
CR5	Market Concentration of five largest banks
DE	Debt to Equity ratio
DF	Degree of Freedom
FAS	Financial Access Survey
FCC	Fully Credit Constrained
FIs	Financial Institutions
GDP	Gross Domestic Products
GLMs	Generalized Linear Models
HHI	Herfindahl-Hirschman Index
IFC	International Finance Corporation
IMF	International Monetary Fund
ISIS	Islamic State of Iraq and Syria
KGF	Credit Guarantee Fund
KOSGEB	Küçük ve Orta Ölçekli İşletmeleri Geliştirme ve Destekleme İdaresi Başkanlığı/ Small and Medium Industry Development Organization

LC	Letter of Credit
LDC	Least Developed Countries
MCC	May be Credit Constrained
MFIs	Micro Finance Institutions
ML	Maximum Likelihood
NACE	Nomenclature of Economic Activities
NCC	Non Credit Constrained
NGO	Non-Government Organization
NUTS	Nomencluture of Territorial Units for Statistics
OECD	Organization for Economic Co-Operation and Development
OLS	Ordinary Least Squares
PCC	Partially Credit Constrained
PDF	Probability Distribution Function
PKK	Partiya Karkerên Kurdistanê (Kurdistan Workers' Party)
R&D	Research and Development
SCP	Structure-Conduct-Performance
SDIF	Savings and Deposit Insurance Fund
SMEs	Small and Medium size Enterprises
SPSS	Statistical Package for the Social Sciences
STD	Short-Term Debt
TD	Total Debt
TESK	Confederation of Turkish Handcraft and Artisans
TUIK	Türkiye İstatistik Kurumu/Turkish Statistical Institute
UNECE	United Nations Economic Commission for Europe
WBES	World Bank Enterprise Survey

Chapter 1

INTRODUCTION

Access to finance and credit gap of small and medium size enterprises (SMEs) is a major concern for many governments and international organizations. The economic importance of providing SMEs with easier access to formal credit and financial services for nurturing their potential growth and sustainability is unequivocal. However, access to formal credit still remains a major barrier to SMEs' growth, especially in the developing countries. While more than 98% of the private firms in developing countries are SMEs, only a small proportion of the banks' loan portfolio consists of SME loan, the lion share goes to the large businesses.

SMEs mostly finance their investment and working capital through internal funds and informal sources. However, when they need external financing, they mostly rely on banks. Trade credit (supplier's credit and buyer's advance) and asset-based finance (e.g. leasing and factoring) are also popular source for their external funds. SMEs have limited access to the capital markets in developing countries although in the developed and emerging market countries they may raise equity capital from capital markets, various private equity funds, venture, and angel investors.

Traditionally SMEs are associated with high information asymmetries due to their opaque and heterogenic business practices. Hence, for decades it has been a persistent challenge for commercial banks to deal with the SME sector. However, a good number of recent studies suggest that banks are now more than willing to do business with SMEs, especially in the emerging market countries (De la Torre, Peria,

& Schmukler, 2010; International Finance Corporation (IFC), 2010; World Bank, 2011a). They are targeting the SME sector to increase their market share and most large banks have dedicated departments and specialized personnel to effectively deal with SME clientele. They are adopting new technology and implementing tailor-made business strategy in order to penetrate this sector successfully.

Along with other emerging countries, Turkey is part of a movement where a paradigm shift is taking place in SME finance. Jenkins (2014) provided inside evidence (by interviewing managers of major banks) that commercial banks in Turkey are targeting the SME sector as one of their mainstream business. It is not a coincidence that in recent years banks involvement with SMEs has increased significantly especially in emerging economies. Given that SMEs are still practicing their business in the same traditional ways, it is intriguing to understand what are the motivations that lead banks to indulge with SMEs? The supply-side analysis addressed the macroeconomic environment that is conducive for commercial bank lending to SMEs. In other words, it determines the macro factors that affect the supply of funds to the SME sector. In Turkey, the empirical evidence confirmed the theoretical expectation that economic growth and stability (higher GDP growth and lower inflation), increased competition in the banking sector and lower government borrowings from domestic creditors paved the way for the growth of bank lending to SMEs.

The firm-level analyses are focused on the demand side perspective of SMEs access to finance. I analyzed firm-level microdata extracted from World Bank Enterprise Surveys (WBES) in Turkey to determine the factors that affect SMEs' usage of (demand for) formal financial services and loans for their working capital and fixed assets financing.

Descriptive analyses from the WBES survey data provided consistent evidence with the recent OECD reports, that in recent years, SMEs found it easier to access to bank loan but their overall demand for external finance have been decreased (Organisation for Economic Co-operation and Development (OECD), 2017, 2018). As evidence, in the 2015 WBES in Turkey, only 16% SMEs had cited access to credit as a major obstacle, only 3 % had complained about the collateral requirement and just 14% mentioned interest rate as an obstacle for not applying for the loan. At the same time less than 20% had applied for a new loan and among them, only 7% had been rejected. Over 70% firms mentioned they did not need external financing instead they used internal financing. Evidently, 85% of SMEs' working capital and 70% of fixed assets were financed by the retained earnings in 2015. All these numbers confirmed that access to finance was not constraining SMEs in the recent years. Nevertheless, the usage of bank loans has decreased in the last two surveys (2013 and 20015) which had been increasing since 2002.

Firm-level analyses also revealed that there were significant regional discrepancies in the usage of financial services and bank loans for funding working capital and fixed assets. Noticeably, 97% of SMEs in Ankara; 90% in Istanbul; 82% in Kocaeli, Sakarya, Duzce, Bolu, Yalova area have saving/checking account whereas some less developed zone in the Anatolian region have less than 15% (i.e. Hatay, Kahramanmaras, Osmaniye have 14%; Erzurum, Erzincan, Bayburt 12%; Agri, Kars, Igdir, Ardahan have only 7%.) The similar difference also exist in the distribution of overdraft facilities ranging from highest 58% in Samsun, Tokat, Corum, Amasya to as low as 9% in Konya, Karaman, Malatya, Elazig, Bingol, Tunceli. Among the firms who already have a loan or line of credit from banks

and/or have recently applied for a loan are also found to be biased by their region or cities in where they operate business activities.

The results of GLMs regression analyses provided statistical evidence of the regional differences in using financial products by SMEs. It also showed that size was positive and significant for all but fixed asset financing meaning that larger SMEs were using more bank services and credit for working capital financing. One of the noticeable findings is that SMEs in the less developed regions, sole proprietors and less experienced owners/managers were using more bank loan for fixed assets financing but less of other forms of bank services. Operating performance indicators such as total sales and gross profit margin were negatively associated with the usage of short-term (working capital) and long-term (fixed assets) loans respectively.

Owner/manager's level of education was also highly significant in defining the use of financial products so much that one additional level of education would have increased the odds of using financial services about 25%. Since education level and utilization of financial products together also reflects managers' financial knowledge and literacy, therefore it is safe to say that SMEs who were associated with lesser financial inclusion were more likely to be managed by the less competent managers. On the other hand, it is also likely that they are constrained by the supply side obstacles (e.g. absence or inadequate bank/brunch, credit rationing) due to lack of financial infrastructure or monopolistic banking practice in those identified regions. There was not enough evidence of gender discrimination for access to financial services in Turkey. All other identified determinants were found to be statistically significant for one or more measures of access to credit.

The definition of SMEs varies across the countries, states, and organizations even different banks define SMEs to their own specification. In this thesis, I used two different size definitions of SMEs in order to be consistent with the source of data. For the supply side analysis, SMEs were defined as less than 250 employees complying with the Turkish government classification of SMEs. For the firm-level analysis, SMEs were referred to the businesses with less than 100 full-time employees as define by the World Bank for the WBES survey in Turkey.

This research provides a complete analysis of SMEs' access to finance from both the supply and demand side perspective. While SME finance has been the focus for a large body of institutional and individual research, most studies emphasize on the barriers and impact of access to finance for SMEs' growth potential. However, there is no quantitative analysis that examines how macroeconomic factors influence commercial bank lending to SMEs. On the other hand, "While data on the financial sector is often considered to be readily available; systematic indicators of access to different financial services are not. Indeed, access is not easy to measure, and empirical evidence linking access to development outcomes has been quite limited because of the lack of data (World Bank, 2008, p. 4)". Hence, this study aims to fill this important gap by measuring access to financial services and its determinants using the firm-level data.

The rest of the thesis is outlined as: Chapter 2 pulled relevant literature, existing research and theories of finance in order to provide a theoretical background of this thesis. In doing so, this chapter first, summarizes the importance and challenges of SMEs' access to credit; then it briefly explains theoretical foundation of credit rationing as well as financing source and choice of SMEs. It also describes different dimensions of measuring access to finance commonly applied in the empirical

studies. Chapter 3 provides a brief summary of Turkish financial crises, reforms, and improvements of commercial banks' lending to the SME sector. Data and Methodology in Chapter 4 describes the source and type of data and explains the econometrics tools and models used in the empirical analyses. The conceptual framework and analyses of macroeconomic variables affecting SME lending (supply factors) are explained in Chapter 5. The following chapter (Chapter 6) explain it from the firms' perspective, that is, the analyses of firm-specific factors affecting the access to finance. It also illustrates important descriptive analyses of firm-level data. The results of regression analyses, their statistical inference and robustness are given in Chapter 7. Then chapter 8 ends the thesis with concluding remarks and policy recommendations based on the empirical findings.

Chapter 2

LITERATURE REVIEW

2.1 Importance of SMEs' Access to Credit

According to the World Bank (2008) "Improved access to finance creates an environment conducive to new firm entry, innovation, and growth. However, research also shows that small firms benefit the most from financial development and greater access—both in terms of entry and seeing their growth constraints relaxed". Large bodies of literature and empirical research have been promoting the vital role of SMEs for economic growth and other socio-economic wellbeing. They are often referred to as the engine of growth in the modern economy. SMEs stimulate entrepreneurship skill, diversify economic activity, make a significant contribution in trade and exports and most importantly generate new jobs. They are flexible and quickly adaptable to changing market demand and supply situation which helps them to be innovative and use high technology (UNECE, 2003).

In developing economies overall, SMEs are comprising over 98% of total private businesses, contributing to over 65% of employment and generating over 50% of the gross domestic product (GDP). In the OECD countries, SMEs make up over 95 percent of enterprises and account for 60 to 70 percent of jobs. According to a recent OECD report, as many as 80% of firms in the developing countries operate informally and employ 60% of the labor force. They are mostly excluded from formal financing (fully or partially) and heavily reliant on internal revenue or

expensive informal source for external funds. Financing obstacle often constraint their growth potential and associated with increased firm illegality (OECD, 2018).

2.2 Access to Finance a Longstanding Challenge for SMEs

Despite the fact that SMEs play a very important role in the economic well-being of many countries, access to finance is still a major constraint for them. Over the last decade, there have been some developments in financing SMEs. However, SMEs' access to formal financial institutions is still limited. IFC (2013) reported that over 40% of SMEs have no access to a financial institution loan or overdraft facilities even though they are in need of one. The dollar amount of this financing gap is estimated to be $3.2 to $3.9 trillion globally among which $2.1 to $2.6 trillion is in the developing economies. Funding gaps are more pronounced in middle and low-income countries where access to finance mostly cited among the major barriers of growth and business operations for SMEs. (OECD, 2018; Kuntchev, Ramalho, Rodriguez-Meza and Yang 2012).

Financial market frictions yield price barriers or discrimination, credit rationing or bar access which is more likely to binding on the poor micro and small firms with growth potential but lack collateral, credit histories, and connections (World Bank, 2008). Using WBES data for 113 countries across the developing world Kuntchev et al. (2012) found that SMEs are more likely to be credit constraint and it is more pronounced for smaller firms. Berg and Fuchs (2013) studied "Bank Financing of SMEs in Five Sub-Saharan African Countries" that showed the share of SME lending in the overall portfolio of banks varies between 5% and 20%. SMEs are mostly reliant on bank loans for their start-up, working capital or investment needs (OECD, 2018). According to OECD (2017), "when seeking bank credit, SMEs continue to face more stringent financing conditions and higher interest rates

compared to large businesses, and find themselves even more at a disadvantage when attracting alternative sources of finance" (p.1, para. 1). Pandula (2011) mentioned that the barriers of SMEs' access to formal credit (credit rationing) may stem either from supply side market failure or demand-side market failure. On the supply side, investors are skeptical about the potential borrower's creditworthiness due to opacity, transaction cost, moral hazard problem, poor property rights, law enforcement problem as well as regulatory impediments (Beck & De la Torre, 2007). On the demand side SMEs' limited resource, entrepreneurs' lack of financial knowledge for preparing a viable proposal or strategic investment vision as well as lack of willingness to attract alternate financing source. As a resulted SMEs often continue to operate in a narrow, illiquid financial market with a relatively low number of market participants serving only a smaller part of the populations Hence, expanding access to finance remain a major challenge across the world particularly in the developing countries (OECD, 2017; World Bank, 2008).

2.3 How Theories of Finance Explain SMEs' Financing Choice and Constraint?

This section provides a brief review of some relevant theories of finance which may largely explain SMEs' access to credit and credit rationing. The motivation of such review is to develop and derive a conceptual framework of SMEs' financing behaviour in the light of theoretical postulations.

2.3.1 Information Asymmetry and Credit Rationing

In a contractual agreement, asymmetric information occurs when one party possesses better material knowledge over the other party. Most contracts of financial products are influenced by information asymmetry. It is one of the prime reasons why lenders are refrained or sceptical to deal with SMEs. The heterogeneity and

opacity nature of SMEs business practice made it hard and costly to acquire necessary information for loan appraisals and due diligence. As a result lenders usually demand sufficient collateral, credible documents (e.g. business license/certificate, audited financial statements, strong performance ratios) as well as other restrictive loan covenants. This type of decision making affects start-ups, younger and smaller firms severely as they often fail to meet those demands (OECD, 2018). Whereas, relatively larger and older firms usually possess sufficient assets, or established track records and required documents to convince the potential investors. BIS (2012) asserted that a market failure exists when lending decisions are made based on collateral and track record instead of the economic viability of the business.

Another traditional practice to reduce information asymmetry is relationship lending where banks learn more insights about the borrower's character and business activities by interacting with them. According to Sharp (1990) "Customer relationships arise between banks and firms because, in the process of lending, a bank learns more than others (banks) about its own customers. This information asymmetry allows lenders to capture some of the rents generated by their older customers (Abstract/para.1, p. 1069,)". However, relationship lending technique may not viable for large, centralized or foreign banks. While, smaller and niche banks rely more on relationship lending, it may not be the cup of tea for large institutions rather they are found to lend to larger and older firms with a stronger financial ratio (Berger and Udel, 2006). However, recent empirical research dispute this conventional wisdom and propose that large and foreign banks, relative to other institutions, can have a comparative advantage through alternative lending technology instead of relationship lending such as asset-based lending, factoring, leasing, fixed-asset

lending and credit scoring (Beck et al., 2009; De la Torre et al., 2010; Jenkins., 2014).

Information asymmetry affects not only the supply side but also the demand for loanable funds. SMEs may not seek for the credit doubting their chance of gaining it or may not aware of the potential benefit of credit or simply lack knowledge of the available source of funds (BIS, 2012). Imperfect information market ultimately leads to adverse selection and moral hazard problems (Stiglitz & Weiss, 1981).

2.3.2 Adverse Selection and Moral Hazard

In their pioneering paper, Stiglitz and Weiss (1981) provide first theoretical justification of credit rationing. They characterized loan market by credit rationing suggesting that even in equilibrium price (optimum interest rate) demand for loanable fund exceeds supply. Consequently, banks use interest rate, loan amount, collateral or equity requirement as a screening device because they perceive those willing to borrow at a higher rate are riskier and vice versa. Nevertheless, interest rate and collateral may implicitly increase the riskiness of the pool of loans in two ways (Stiglitz & Weiss, 1981).

1) Sorting the borrowers (adverse selection): the probability of repaying the loan is different for different borrowers. Banks cannot directly control/observe the behavior or action of the borrowers. However, as an attempt to identify the good borrowers, banks formulate the price and terms of the loan which may deny borrowers who are indistinguishable from those who receive loans (Stiglitz and Weiss, 1981). In the process, banks may reject potential viable projects, worse, end up lending riskier ones.

2) Affecting the actions of borrowers (moral hazard): similarly, the behavior of the borrowers may be influenced by the terms, price and collateral requirement.

Stiglitz and Weiss (1981) suggested that high-interest rate may decrease the return of the proposed project as consequence borrowers may undertake riskier but higher payoff projects. Hence, decreasing the probability of repayment, which in turns reducing the expected return of banks as it (expected return) is the function of the probability of repayment of the loan portfolio.

2.3.3 Trade-off Theory and Optimum Debt

The trade-off theory of capital structure justifies the optimal mix of debt and equity finance for a firm. Here, optimal capital mix refers to a target debt ratio (Debt/Equity or Debt/Value) that maximizes the value of the firm whilst minimizing the cost of debt. This theory hypothesizes that debt ratio is determined by a trade-off between the cost and benefit of borrowing, assuming assets and investment plans remain the same (Myers, 1984). That is to say that, firm's choice of leverage is a function of interest tax shield (benefit of tax exemption on interest payment) and financial distress cost incurred from excess debt level.

In the absence of tax and financial distress, it is irrelevant, in other words, firms are indifferent of choosing between debt and equity finance. In the presence of both taxes and probability of financial distress, this theory postulates that firm borrows up to the level where marginal benefit from the interest tax shield equals the distress cost arises from the additional debt level. In the corporate finance literature, it is also known as the static theory of capital structure (Ross, Westerfield & Jordan, 2008, p. 418).

However, the implication of the trade-off theory is not only limited to corporate finance; it can also be applied in the SME sector. The use of debt financing varies from firm to firm or across the industry which may be explained by this theory. For instance, firms that are subject to high tax policy (e.g. textile, leather tobacco etc.) or

firms with plenty of taxable income are more likely to use debt financing to capture the tax shield, whilst, some sector may exempt from tax burden (e.g. farming and agro-business) for whom tax shield benefit is irrelevant. Similarly, firms with high intangible assets (human assets) operating in an environment where property right and/or court system is relatively poor, may prefer to hold less debt finance to prevent the distress/bankruptcy cost.

As with most theories, trade-off theory also has its share of criticism. Specially, it fails to explain why some of the most profitable firms borrow the least? High profit means more taxable income to shield, hence, according to this theory high-profit firm should target a higher debt ratio but in practice, it's quite the opposite more often than not (Myers, 1984). Here, the old fashioned pecking order theory may come handy when trade-off fails.

2.3.4 Pecking Order Theory and Financing Decision

Pecking order theory simply suggests that new investments should finance first with internal funds (retained earnings primarily), then debt should come second in pecking order (if it needs external finance); whereas, equity finance should be considered as a last resort when the firm run out of debt capacity (Brearly, Myers & Allen, 2011, p. 460).

In contrast with trade-off theory, pecking order suggests that most profitable firms borrow less and use retained earnings for their investment opportunities as internal finance comes first in the pecking order. For the same reason, less profitable firms borrow more because they do not generate sufficient retained earnings for their investment projects (Brearly, Myers & Allen, 2011, p. 462).

While the trade-off theory is backed with precise assumption and theoretical reasoning (i.e. tax shield and distress cost), pecking order doesn't provide such

insights; rather, it is viewed as a rule of thumb for financing decision. Myers (1984) mentioned “I could think of no theoretical foundation for it that would fit in with the theory of modern finance. However, recent work based on asymmetric information gives predictions roughly in line with the pecking order theory”. Later on, Myers and Majluf (1984) suggested firms follow a hierarchic financing choice to minimize adverse selection cost of security issuance.

In their theoretical predictive model for access to external finance, Bougheas, Mizen & Yalcin (2005) assumed “monitoring costs make bank credit more expensive than credit from the capital market, therefore, the only firms that seek bank loans will be those that do not have access to the capital market” which is more relevant for the SMEs. As our subject matter is SMEs’ access to credit, apparently we assume most of them have rare or no access to the capital market. In this context, equity finance would predominantly refer to the owner’s personal investment and/or funds from family, friends or other informal sources. Beck, Demirgüç-Kunt, and Maksimovic (2008) investigated firms’ financial pattern in 48 countries in which the authors found suggestive evidence that pecking order holds across countries.

2.4 Common Barriers in SME Lending

Small business lending differs from that of large corporations. Some firm-specific and business attributes of micro and small firms do not comply with the conventional commercial bank lending standards which make it difficult for lenders to evaluate their loan applications. This section high lights some of those features that are commonly regarded in the literature.

Ownership: most small businesses are sole or family owned where any personal or family dispute can jeopardize the business performance. Consequently, the success and sustainability of such businesses are unpredictable; hence, they are

viewed as high-risk client to the lenders. In addition, in some environment certain category of entrepreneurs may face financing discrimination regarding their ethnicity, gender, and sexual orientation (e.g. women, migrants, gay).

Heterogeneity: small businesses are essentially diverged in their nature of businesses, operations, capital, turnover, ethics, cultures, and so on. Every business is exposed to some own specific risks which are difficult to assess for any outsider who does not have good knowledge about that business. As a result, it requires special effort for risk evaluation, appraising, and monitoring process. Therefore traditionally banks have been reluctant to bother for these extra efforts.

Inadequate track record and financial documents: almost all the informal, as well as many formal SMEs, have no or limited credit history and they do not follow standard accounting, let alone certified financial statements. Therefore it is not possible to use traditional financial statement, credit rating or ratio analyses to evaluate the loan applications. On the other hand, qualitative analysis requires personal information about the business and its owner which is often lengthy and costly.

Collateral: most small firms (baring some manufacturing ones) and start-ups do not possess adequate or appropriate collateral. Since, lending to SMEs perceived as highly risky by the lenders, they usually face a higher proportion of collateral requirement. Many small firms do not bother to apply for a bank loan because they think they do not have enough collateral to convince the banker.

Transaction costs: evaluating SME loan applications require special attention and close monitoring which in turn require time and manpower, making the loan evaluation process costly. Furthermore, banks have to deal with a large volume of loan applications of a relatively smaller amount that makes it higher cost of per

dollar lending. As a consequence, it reflects the pricing of the loan and other transaction costs. According to OECD (2018) “Transaction costs are particularly high in relative terms for micro-enterprises, start-ups, young SMEs, innovative firms and businesses located in remote and/or rural areas, potentially excluding them from any sources of formal external financing”.

2.5 Common Sources of Funds for SMEs

Most small businesses largely depend on banks for external finance as they do not have the luxury of the wide range of alternative funds that larger corporations do; such as bonds, stocks, and other national and international financial institutions. Kuntchev et al (2012) studied the financing sources in the developing countries where the authors showed that there is considerable heterogeneity in the source of finance for SMEs. Among them, most common sources for funding small and medium-sized businesses are:

Internal funds: it is the retained earnings of the business for sole proprietors it may also refer to entrepreneur’s personal savings/contribution. Internal funds are the primary source for financing working capital as well as investment needs; specially, smaller firms rely heavily on internal funds. It comes first in the pecking order theory of financing choice which postulates the firm should consider external financing only if they do not generate enough revenue to finance the project.

Banks and other formal financial institutions: even though banks provide a small share of their loan portfolio to SMEs, the dollar amount of that exposure are still outnumbered by any other source of finance. Because a small portfolio (loan) of a large bank may well exceed the combined portfolio of NGOs or other non-institutional lending. Empirical research shows that financial and institutional

development of a country is significantly correlated with external financing (Beck et al., 2008).

Equity financing: stands as the last source of funds according to the pecking order which holds for the small business as well. The stock markets are the main source of equity capital where large and public corporations are concerned, but very few SMEs are listed to such markets. However in developed and some emerging economies many small firms also raised equity capital from the private equity investors, angel investors and venture capital funds. Equity finance provides the entrepreneurs for start-up or even seed capital, thus having access to such funds at those initial stages is a blessing for many entrepreneurs.

Asset-based financing: leasing and factoring are among the most popular alternative source of debt financing which are backed by the pledged assets. In the leasing arrangement, the lender (lessor) provides the underlying asset or necessary funds for fixed asset investment as a right to use agreement in return for a series of payments (i. e. interest). Leasing is particularly used by fast-growing SMEs as a preferred alternative source of medium to long-term financing (Kraemer-Es & Lang, 2012). Whereas, factoring is another type of debt finance where the lender provides the pledged fund backed by the account receivables of the borrower for a certain pre-specified discount. It is among the most popular alternative source for short-term working capital financing.

Trade credit: firms generate most of their working capital through trade credit from the suppliers, buyers, and other stakeholders of the business. Financial Institutions (FIs) ease the process by providing guarantees, LCs, advisory and other fee and non-fee-based services.

Informal sources: are mainly referred to the borrowings from friends, family, NGOs and other non-institutional money lenders such as land lords, goldsmiths local shopkeepers etc. Micro and small business entrepreneurs mostly relay on these source of funds for their initial investments to start the business. In some less developed countries, these are the main source of the SME finance even though they are far more costly than banks. This indicates that they are willing and able to pay higher interest rate.

2.5.1 Government Subsidiary and Policy to Facilitate SME Finance

Finding a sustainable way to overcome or minimize SMEs' financing gap has been a major concern for many government and international organizations. In order to provide easy finance to the SME sector, governments around the world have implemented various programs. Among them, most common practices are direct government interventions such as partial credit targeting, subsidized credit programs, and low-interest policies. However, direct or indirect interventions of the government might create poor outcomes and market distortions even though well intended. Past experiences of such programs that aimed to disburse cheap credit to micro and small businesses have failed to provide sustainable finance for SMEs. More often than not these programs benefitted a very limited number of firms who are likely to be well connected rather than the targeted poor ones. Moreover, these programs created a moral hazard as the borrowers viewed these loans as gifts rather than credits. Therefore, they did not feel obligated to repay their loans.

However, credit guarantee schemes such as export guarantees, foreign exchange, and interest rate guarantee programs have been widely adopted policy in the OECD countries. Direct investment and/or co-investment program through funds by the government also an effective means of reducing supply gap; specially, for start-up

and early-stage capital needs. For instance, Yozma programme(Israel), Danish Growth Capital Fund, and Turkish Growth and Innovation Fund are some successful co-investment program between the private and public sector (OECD, 2018). Also, proponents strongly recommend that women, immigrant or other minor entrepreneurs who are mostly excluded from the formal financing sector should be given special support (e. g. subsidy, lower rate, credit guarantee etc.).

2.5.2 Micro Finance Institutions (MFIs)

In developing and less developed countries, there are various types of microfinance schemes helping the self-employed and micro-entrepreneurs. Their primary target group are the micro scale, rural-based, women entrepreneurs who are non-customer to the conventional commercial banks. These schemes usually provide small amounts of working capital to the individuals or a group leader in group lending who guarantees for his or her group members. The crucial facts for the success of group lending are the formation of the group, training, credit management and information sharing among the group members. One of the world pioneers of such microfinance scheme is Prof. Muhammad Yunus who initiated micro-banking services in Bangladesh in the mid-1980s. He along with his microfinance institution 'Grameen Bank' received the Nobel peace prize in 2006 for providing non-collateralized finance to millions (8 million borrowers as of 2015) of rural women in Bangladesh. Most of those recipients family were able to get rid of the extreme poverties.

2.6 Measuring Access to Finance

"Access to financial services—financial inclusion—implies an absence of obstacles to the use of these services, whether the obstacles are price or nonprice barriers to finance" (World Bank, 2008, p. 2). Measuring access to finance can be

ambiguous as it has various dimensions. Physical excess or outreach (some availability measure of bank/branches/ATM etc.) is considered as an important dimension of access to finance in developing countries (Arora, 2014; Sarma, 2008). Another common measure of access to credit is the funds flowing to this sector; such as loan amount, frequency, growth etc. (Sarma, 2008; Zarook, Rahman & Khanam 2013a, 2013b), Other frequently used proxies are balance sheet ratios such as debt to equity (D/E), short-term debt to total debt (ST/TD), bank debt to total debt (BD/TD) etc. (Bougheas et al., 2005; Lago Lopez & Saurina ,2007). The advantage of measuring these dimensions (physical outreach, loan supply, and balance sheet ratios) of access to credit is the availability of data. These are macro-level data mostly available from secondary sources and therefore relatively easier to obtain.

From the demand side, SMEs access to credit mainly derived from the survey questionnaires; where, SMEs are asked to report their financial activities and preferred financing sources. As SMEs mainly use bank products for formal financing, empirical studies tend to focus on whether they possess any bank account, line of credit, overdraft or credit card facility (Pandula, 2011; Minh Le, 2012; Sarma, 2008).

However, both the supply and usage data are criticized on several grounds. For instance, they ignore the rejected applications and voluntary exclusion; loan supply may increase if a handful of SMEs benefitted from the supply source. Supply data also ignores the use of alternative financing sources such as internal finance, trade credit, factoring etc. On the other side, World Bank (2008) stressed that it is important to distinguish between usage of and access to financial services. While usage refers to the actual users, access is a much broader concept that encompasses

the availability of financial services to both current users and non-users (voluntary and involuntary).

Another widely used firm-level measure is firms' self-reported perceptions of financial obstacles and/or constraints. Beck, Demirguc-Kunt, Laeven, and Maksimovic (2006) measured financing obstacles using WBES survey; where firms were asked to rank the extent to which they perceive finance as an obstacle in an ordinal manner from no obstacle to severe obstacle. However, the author cautioned relying on unaudited self-reporting firm's perception of financing obstacles, suggesting some of the firms might not actually be constrained by them.

Kuntchev et al. (2012) introduced another measure of credit constraints, where they classified all firms in four distinct categories of credit constraint.

1. Fully credit constrained (FCC): firm that has no external finance and either rejected from recent loan application or did not bother to apply even though they needed for external financing.
2. Partially Credit Constrained (PCC): firms in this category meet the other conditions of FCC, except that they used some other source of external financing.
3. May be Credit Constrained (MCC): firms in this category have previously accessed to external financing and/or applied for one but it was not possible to ascertain whether they faced some form of obstacles or partially rationed.
4. Non Credit Constrained (NCC): in this category, firms did not apply for a loan or required external credit because they had enough capital/internal finance.

Chapter 3

FINANCIAL REFORMS AND LENDING ENVIRONMENT IN TURKEY

3.1 A Brief History of Financial Crises and Reforms in Turkey

In the 1960s and 1970s, Turkey followed an import substitution industrialization strategy in which protectionist economic policies were applied. Starting from 1980, Turkey began to liberalize its economy and to adopt open, export-oriented economic policies. Turkish financial system was liberalized in two phases. First, interest rates were liberalized in 1980, and the liberalization of the capital account and full liberalization of the economy continued in the following years (Pehlivan and Kirckpatrick, 1992; Ucer, 1998). These policies were supported by the World Bank structural adjustment and stabilization programs in Turkey that aimed to promote economic stability and growth. However, most of these reforms were implemented in an inflationary and unstable economic environment, and the country went through several financial and economic crises between 1980 and 2001. High inflation, sharp exchange rate depreciation and macroeconomic instability became regular phenomena in Turkey throughout the 1980s and 1990s. During this period economic growth fluctuated between −5.5% and over 9% and the inflation rate fluctuated around 80%. In the late 1990s, the East Asian financial crisis worsened the economic instability in Turkey. The capital inflows to the Turkish financial sector declined suddenly and economic growth decreased sharply from 7.5% in 1997 to 2.5% in 1998.

Between 2000 and 2001 Turkey experienced a severe financial crisis in which 18 domestic banks had to be liquidated. Before the crisis, Turkey already had a fragile banking system in which banks relied heavily on financing the government budget deficit (Özatay and Sak, 2002). The banking sector acted as the government agent, financing mainly government debt instruments. Interest rates on treasury bills and bonds were on average 30% above the inflation rate during the 1990s (Figure 3.1). This high yield encouraged banks to borrow from abroad and invest in Treasury securities. As a result, both the capital and money markets became heavily dependent on short-term capital inflows. In the year 2000, more than half of the interest earnings of private banks consisted of government securities, whereas almost two-thirds of their liabilities were denominated in foreign currency (Akyüz and Boratav, 2003). Consequently, the banking sector was exposed to foreign exchange rate risk and became vulnerable to sudden capital reversals. In the same year, government borrowing went up to 40% of GDP and the interbank rate jumped to 873% as the interbank credit market dried up (Koen Brinke, 2013). In February 2001 the Turkish lira depreciated by about one-third of its value against the dollar. Private banks made big losses as a result of their unhedged foreign currency positions. The Savings and Deposit Insurance Fund (SDIF) had to rescue 18 banks and the total banking sector asset decreased by 12% in real value during the crisis. The Istanbul Stock Exchange fell by 14% and the economy shrunk by 5.7% (BRSA, 2010).

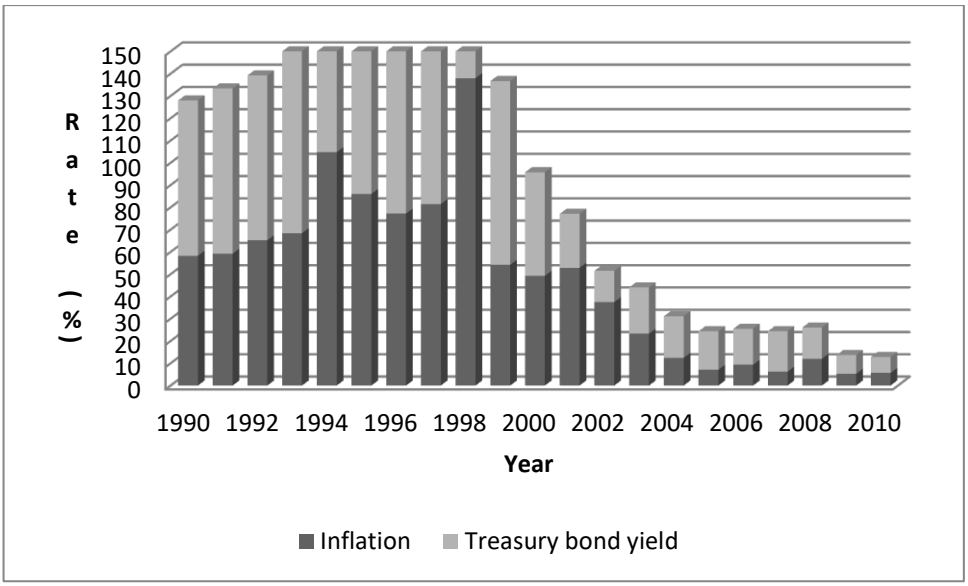

Figure 3.1: Treasury bill rate and inflation rate in Turkey
Source: Based on OECD[1] and World Bank[2] data

3.2 Turkish Banking System Reforms and Development

Turkish Banking system fragility was deeply realized through the frequent financial crises in the 1980s and 1990s. In 2000, Turkey established an independent banking authority "Banking Regulation and Supervision Agency (BRSA)". The main objectives of BRSA were to ensure the confidence and stability in financial markets, provide effective operating of the loan system as well as to safeguard the rights and interests of depositors (BRSA, 2010). Immediately after the crisis, BRSA took policy initiatives and restructuring program in order to strengthen the regulatory and supervisory framework. Various amendments in banking laws were made according to the international best practice and EU directives.

Along with the reforms in the banking sector, the new government elected in 2002, led by Prime Minister Erdogan, took initiatives to improve the business environment. For instances, the new law in foreign direct investment policy which

[1] Organisation for Economic Co-operation and Development (OECD), Main Economic Indicators for Turkey. https://data.oecd.org/turkey.htm.
[2] World Bank, World Development Indicators. http://data.worldbank.org/indicator.

reduces the bureaucracy for foreign company, large profit tax cut, and privatized state enterprises. State banks and banks under SDIF control were privatized, merged with or transfer to another bank (Koen Brinke, 2013). All these favoured retrieving investors' faith both home and abroad resulting significant capital inflow. The economy recovered from the crisis and started to grow steadily. From 2002 to 2007 Turkey succeeded about 7% growth rate on average. In 2004, both the inflation and unemployment rate came down to single digit. Finally, macroeconomic stability achieved along with a stable political regime which helped the country's private sector to develop.

Over the last decade, Turkish banks have significantly expanded their physical and digital branch networking as well as manpower both at home and abroad. Which help them outreach to the previously unbanked customers and provide more integrated financial services within and across the border.

Table 3.1 and Table 3.2 give numerical accounts of how Turkish banks' branch networking and outreach have improved since the early 2000s. Although the number of banks remained around 50, the number of branches has doubled from over 6 thousand to over 12 thousand. (Table 3.1) The number of foreign branches also increased to 77 in 2017 which was just 33 in 2002. It also shows that increased branch network also doubled the number of staff from 2002 to 2017. The number of Automated Teller Machines (ATMs) quadrupled during the same period.

Table 3.2 shows the improved outreach of the Turkish commercial banks since the mid-2000s. From the last two columns of this table, we can see that the number of borrowers per thousand adults has significantly increased to over 800 borrowers from under 530 in 2004. On the other hand, the number of depositors per thousand adults has reduced a little during the same period.

Table 3.1: Expanding branch networking of Turkish banks at home and abroad

Year	Number of Banks	Domestic Branches	Branches Abroad	Number of ATM's	Number of Domestic Staff	Number of Staff Abroad
2002	54	6,170	33	12,035	123,627	382
2003	50	6,039	39	12,726	123,572	458
2004	48	6,177	42	13,556	127,391	553
2005	51	6,521	47	14,836	138,169	555
2006	50	7,256	46	16,513	150,462	504
2007	50	8,071	51	18,795	167,212	548
2008	49	9,250	54	21,953	182,100	565
2009	49	9,526	55	23,952	183,614	591
2010	49	10,000	66	27,604	190,586	594
2011	48	10,440	77	31,662	194,617	654
2012	49	10,981	80	34,709	200,745	708
2013	49	11,903	83	40,112	213,431	795
2014	49	12,125	85	43,668	216,063	849
2015	50	12,185	84	46,220	216,722	782
2016	50	11,664	83	46,373	210,112	774
2017	49	11,507	77	47,338	207,532	748

Source: Data collected from www.bddk.org (accessed on 5 September 2018)

Table 3.2: Enhanced outreach of the Turkish commercial banks

Year	Branches of commercial banks per 1,000 km2	Branches of commercial banks per 100,000 adults	Number of ATMs per 1,000 km2	Number of ATMs per 100,000 adults	Borrowers at commercial banks per 1,000 adults	Depositors at commercial banks per 1,000 adults
2004			17.61	28.48	528.77	
2005	8.15	12.94	19.28	30.60	595.26	1412.71
2006	9.01	14.05	21.46	33.45	607.58	1418.82
2007	9.99	15.32	24.42	37.44	689.40	1391.60
2008	11.38	17.16	28.52	43.01	705.80	1298.62
2009	11.69	17.34	31.12	46.13	745.79	1280.97
2010	12.28	17.88	35.87	52.21	767.07	881.63
2011	12.76	18.24	41.14	58.79	816.40	911.19
2012	13.28	18.62	45.10	63.22	872.81	920.79
2013	14.31	19.67	52.12	71.65	846.60	978.99
2014	14.57	19.64	56.74	76.47	837.50	968.62
2015	14.53	19.20	60.05	79.35	844.92	1034.18
2016	14.00	18.14	60.25	78.08	803.89	1212.57
2017	13.69	17.39	61.51	78.12	802.83	1351.02

Source: Data collected from the Financial Access Survey (FAS) by IMF.

3.3 Commercial Banks' Lending to SMEs in Turkey

In the 1980s and 1990s, SMEs in Turkey operated in an unstable macroeconomic environment shaped by high inflation, frequent financial crises, and economic recessions (Akyüz, 1990; Ertugrul and Selcuk, 2001). These unfavourable conditions negatively affected SMEs and discouraged banks from extending credit to this sector. In order to help offset these poor economic conditions, numerous government programs[3] were introduced in 2004 and 2005 to support SMEs' development and growth. As a result of Turkey becoming a candidate for EU membership, a number of EU projects had also been created to support SMEs in the country (OECD, 2004).

According to the official statistics (TUIK) in 2009, there were about 3.2 million businesses in Turkey and 99.9% of these were SMEs. In Turkey, the term "SMEs" includes not only small and medium-sized enterprises but also microenterprises[4]. As many as 96% of all SMEs in Turkey are microenterprises; while, 3.5% are small and only 0.50% are medium-sized (KOSGEB, 2011). This indicates that the majority of businesses in Turkey are very small businesses. However, these businesses play a very significant role in the economy, accounting for 78% of employment, 55% of GDP, and 59% of exports (KOSGEB, 2011). Nevertheless, SMEs' share of commercial bank credit remained very low until very recently. It is estimated by the State Planning Organization of Turkey that SMEs received only 5% of the total bank credit in the 1990s which has increased to over 25% in recent years.

[3] These programs were executed by both governmental and non-governmental organizations. Three of the most important institutions are the Small and Medium Scale Enterprises Development Organization (KOSGEB), the Credit Guarantee Fund (KGF), and the Confederation of Turkish Handcraft and Artisans (TESK).

[4] In Turkey, SMEs are classified as follows: businesses with fewer than 10 employees or annual sales of less than 1 million TL are classified as microenterprises; businesses with 10–49 employees or annual sales of 1–5 million TL are classified as small businesses; and businesses that have 50–249 employees or annual sales of 5–25 million TL are classified as medium-sized businesses (KOSGEB, 2011).

Table 3.3: Growth of commercial banks' lending to SMEs in Turkey

Year	Growth of outstanding loans to SMEs by commercial banks		Outstanding SME loans with commercial banks	Outstanding SME loans with commercial banks	Number of SME Customers at Commercial Banks	SME borrowers at Commercial Banks
Ending	(Nominal %)	(Real %)	(% of Total Loans)	(% of GDP)	(Average of 12 months)	(% of Non-Financial Corp.)
2006			27.22	6.97	1627114	
2007	13.76	4.96	23.74	8.07	1971375	
2008	23.23	11.97	22.75	7.85	1593137	65.34
2009	-3.39	-9.31	20.57	7.47	1629113	45.10
2010	25.87	18.30	19.33	9.62	1729653	51.17
2011	44.07	30.44	21.44	10.38	1906265	45.24
2012	18.51	11.63	21.83	11.05	2146505	46.59
2013	36.90	27.46	22.68	13.14	2502183	60.85
2014	27.08	17.48	24.33	14.59	2870206	88.92
2015	21.60	11.76	24.73	15.01	3344068	57.22
2016	9.76	1.13	23.24	14.63	3704116	60.09
2017	18.89	6.23	22.84	14.97	4090802	75.82

Source: Data collected from BRSA (BDDK) and FAS (IMF)

Table 3.3 shows the growth of commercial bank lending to SMEs in Turkey since 2006. In the last 10 years, outstanding loan to SMEs has been growing consistently at a high pace. Only exception is in the aftermath of the global financial crisis in 2009, when the real growth of SME loans shrank by 9%. However it was quickly recovered and reached as high as 44% nominal growth (30% in real term) in 2011. Although the real growth has slowed down to single digit in the last two years, the share of SME loans to the total banking sector loans remained consistent at over 20%, which is about 15% of the GDP. This table also shows that the number of SME customer at commercial banks has been consistently increasing reached as high as 4.09 million in 2017 which was about 1.63 million a decade ago. The number of SME borrowers in 2017, makes up over 75% of all non-financial corporations in Turkey, which was 65% in 2008. Overall, the numbers of the table 3.3 shows that SMEs' access to finance in Turkey has been improving consistently since mid-2000s.

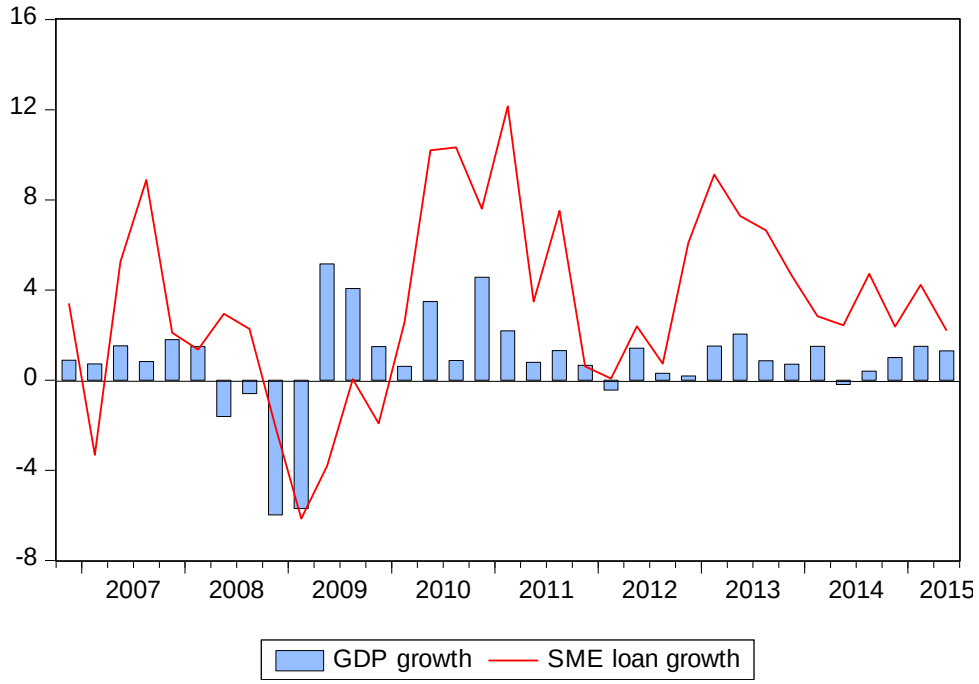

Figure 3.2: SME loan growth moves in line with GDP growth
Source: Data collected from BDDK and World Bank (development indicator)

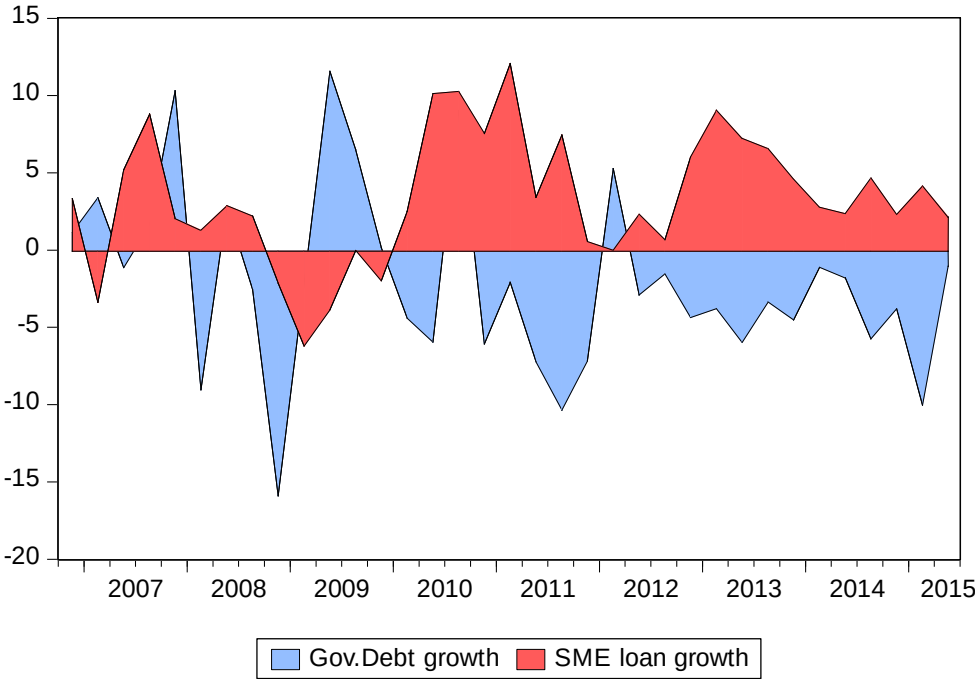

Figure 3.3: SME lending grows as government debt shrinks
Source: BDDK and World Bank (quarterly public sector debt indicator)

In the recent years, the most important development in SME lending in Turkey, is the increased interest on the part of commercial banks in providing financial services to SMEs. After the inflation rate fell from around 75% per annum in 2001 to 7% in 2005, banks started to establish SME banking departments to target SME clients for lending and to provide them with other financial services (Jenkins, 2014). Bank lending to SMEs moved in line with GDP growth: it declined during the global financial crisis in 2008- 2009, then recovered after 2010 (Figure 3.2).

Turkish banks also relaxed collateral requirements from the SME sector. According to the WBES 2008[5]. data, the proportion of total SME loans that required collateral was only 67.7% in Turkey. This rate is much lower than both the regional and world averages of 89% and 88% respectively. The average value of collateral required for SMEs loans (measured as the percentage of the loan amount) also declined from 105% in 2005 to 77% in 2008. Again, this rate is much lower than the upper middle-income country average of 92% in 2008 and is the lowest value of collateral needed within the Eastern Europe and Central Asia region (WBES country report Turkey, 2011)

Another important factor that appears to be closely related to the recent SME lending growth in the Turkish market is the decrease in government debt. Prior to the mid-2000s, Turkish banks were highly concentrated in financing public debt and large corporations (Akyüz and Boratav, 2003). When government borrowing started to decrease, banks' lending to SMEs began to increase. Figure 3.3 illustrates this negative relationship between SME lending and government borrowing.

[5] Recent WBES surveys in Turkey did not have this question. So, 2008 was the latest available data regarding collateral requirement.

Chapter 4

DATA AND METHODOLOGY

4.1 Data

The historical data on SME loans provided by the Turkish banking sector is available on the BRSA website[6] from 2006 onwards. The macro data used in the time series (OLS) regression and other related macro analyses are obtained from secondary sources that are published online by the World Bank (WB), International Monetary Foundation (IMF), International Financial Corporation (IFC), Organization for Economic Co-operation and Development (OECD), and Turkish Statistical Institute (TUIK) database.

For GLMs regression and other firm-level descriptive analyses, I extracted the raw data from the World Bank Enterprise Surveys (WBES) database, a joint initiative of the World Bank and its Regional Partner Organizations. The objective of the WBES survey is to obtain feedback from enterprises in client countries on the state of the private sector. Through interviews with firms in the manufacturing and services sectors, the WBES surveys assessed the constraints to private sector growth and create statistically significant business environment indicators that are comparable across countries.

[6] http://www.bddk.org.tr

WBES sample firms were selected using stratified random sampling[7]. Three levels of stratification were used; a) industry sector, b) firm size, and c) cities/geographic region. Therefore, the final total sample includes firms from all different sectors and not concentrated in just one or few industries/sizes/regions. Agriculture/farming sector, financial institutions (FIs), and fully government-owned enterprises were not included in the surveys. In Turkey the first WBES survey was conducted in 2002, then followed up in 2005, 2008, 2009-2010 (financial crisis survey only), 2013 and the most recent one was in 2015.

In regression analyses, I used the 2015 survey, as it has the most balanced and largest sample size with 6006 firms. In the descriptive analyses, I also used data from 2005, 2008 and 2013 surveys; where the sample sizes were 1323, 1152, and 1344 firms respectively. The WBES questionnaires were standardized to make it convenient for comparative analyses across all the surveys, except for the year 2002. The sample size was also relatively small in 2002 survey with only 350 firms, so it was mostly excluded from the analyses.

For the WBES surveys in Turkey, the size of the firms was based on the number of current permanent full-time employees at the time of the surveys. Where, firms with at most five full-time employees are considered as micro (1 to 5), small (6 to 19), medium (20 to 99) and firms with at least 100 employees are considered as large size. For the purpose of comparing between SMEs and large firms, we mainly grouped them in two categories; firms with less than a hundred employees are SMEs (including micro firms), and firms with a hundred or above employees are considered to be large

[7] Full information regarding WBES survey sampling and implementation can be found at http://www.enterprisesurveys.org/~/media/GIAWB/EnterpriseSurveys/Documents/Methodology/Sampling_Note.pdf.
(See Ayyagari, Demirguc-Kunt, & Maksimovic, 2011; Beck et al., 2006; Kuntchev et al., 2012 for more on WBES data).

4.2 Methodology, Hypothesis, and Regression Equation

This section will explain the various econometrics methods applied in the time series (OLS) and cross-section (GLMs) regression analyses followed by their respective hypotheses and finally expressed the models as a functional equation.

4.2.1 Ordinary Least Square (OLS) Model

The historical data on the growth of commercial bank lending to SMEs was regressed with GDP growth, inflation, government borrowing and the competition in the banking sector. This was a growth model and the variables were stationary at the level form. All the data were expressed in quarterly periods and the growths were calculated as the percentage change from the previous quarter. Therefore, a multivariable time series OLS regression model was applied. The E-views software was used for this particular regression analysis.

4.2.1.1 Hypothesis

As it is explained within the conceptual framework (Chapter 5), the macroeconomic environment plays a crucial role in determining the extent of banks' lending to SMEs. Therefore, my analysis is based on the hypothesis that the growth of SME finance provided by the commercial banks is led by the macroeconomic stability, economic growth, and the competition within the banking sector; while, it is hindered by the extent of government borrowings.

4.2.1.2 Equation for the OLS Regression

The equation of the model is:

$$SME\ Lending = f(GDPgrowth, Inflation, Gov.Debt, Banks'Competition)$$

$$SME\ Lending\ growth = \alpha + \beta_1 GDPgrowth\ rate + \beta_2 Inflation\ rate + \beta_3 Government\ Debt(\%change) + \beta_4 Bank\ Concentration(\%change) + \epsilon \quad (1)$$

In this model (equation 1), the coefficient α is the intercept of the regression line which represents the constant growth of bank lending to SMEs, regardless the effect of independent variables. $\beta_{1,}$ $\beta_{2,}$ $\beta_{3,}$ and β_4 are the correspondent coefficients of the independent variables which are GDP growth, inflation, government borrowing and bank concentration (i.e. competition) respectively. They represent the proportional effects that the corresponding variables have on the growth of the dependent variable. A positive (negative) sign of these correspondent coefficients would be indicating the positive (negative) effect on the growth of SME loan. We expect that GDP growth associates positively with the bank lending to SMEs; whilst, inflation, Gov. debt (government borrowings from domestic creditors), and bank concentration are negatively associated. Lastly, ϵ is the error term of the model. Error term accounts for the effect of other factors that cannot be explained by the model.

4.2.2 Generalized Linear Models (GLMs)

As the probability distribution function (pdf) of the cross-section variables were non normal, so, we applied generalized linear models (GLMs). GLMs allow the dependent variable to be categorical or continuous and assumes its mean is linearly related with the explanatory variables which could be categorical, continuous or a mix of both. More specifically, GLMs generalize models by allowing other than normal distributions for the error, and permitting to model a function of the mean; where maximum likelihood estimators are used instead of least squares estimators.

Mathematically, if the mean of $Y = \mu$, then the link function relates μ with the linear predictors (x_i); such that:

$$g(\mu) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \ldots\ldots + \beta_k x_k + \varepsilon \qquad (2)$$

4.2.2.1 Binary Logistic (Logit) Model

The logit model was used where the dependent variables were dichotomous. For instance, whether SMEs have a saving/checking account, overdraft facilities, loan/line of credit, recently applied for a loan. Since, these response categories can take one of two values; "No=0" or "Yes=1"; the dependent variable Y has binomial (Bernoulli) distribution with probability for success $P(Y=1) = \pi$, then probability of failure $P(Y=0) = 1 - \pi$, and mean $E(Y) = \pi$.

Thus, the logit regression has the equation form as:

$$ln(\pi/(1-\pi)) = \alpha + \beta x + \varepsilon \quad (3)$$

Which is equivalent to $\pi = \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}}$

Wher,e $0 \leq \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}} \leq 1$

In this model (equation 3), the link function is logit (log of odds). Since (for binary variables) $\mu = \pi$, so, the link function is also the odds ratio.

Hence, $g(\mu) = ln(\mu/(1-\mu)) = ln(\pi/(1-\pi))$.

Therefore, the model (3) linearly relates the log of odds of the dependent variable (y) with the predictor variables (x).

4.2.2.2 Negative Binomial Model

In order to determine what explains SMEs' proportion of the working capital or fixed assets financed by banks, the negative binomial regression model was applied. The frequency distributions of the dependent variables were found to be non-normal and positive integers. Hence, modeling for distribution of count data is a better fit for these variables. However, because of the over-dispersion, we chose negative binomial over Poisson regression (Poisson model assumes mean and variance to be equal). According to Agresti (2007) "When the Poisson means follow a gamma

distribution, unconditionally the distribution is the negative binomial" (p. 81, footnote no. 2). "The negative binomial distribution arises as a type of mixture of Poisson distributions. Unlike the Poisson; it has an additional parameter such that the variance can exceed the mean" (p. 81).

The numeric (ratio) responses of dependent variables (percentage of working capital and fixed assets funded by the banks) were positive integers from 0 to 100. Their frequency distributions were concentrated at a relatively large frequency of zeros (about 70%) and some other values such as 20, 30, 50, 80 and 100. Therefore the distributions of "Working Capital" and "Fixed Assets" have relatively low mean (9.2, 18.7) and higher variance (427, 1070) respectively. Therefore, the distribution of positive integers and highly disperse variance theoretically justify the selection of the "negative binomial" model for these two response variables.

For a single variable x, the equation of the model is:

$$Ln\ (\mu) = \alpha + \beta x + \varepsilon \qquad (4)$$

$$Hence,\ \mu = exp(\alpha + \beta x) = e^{\alpha}(e^{\beta})^{x}$$

$E(Y) = \mu$, *and* $Var(Y) = \mu + D\mu^2$ [where, D is a nonnegative dispersion parameter. The parameter D can be assumed to be fixed for all x values, as in OLS model assuming the variance parameter (σ^2) to be constant. As in Poisson log linear model, the log link function is also commonly used in negative binomial model].

In this model (equation 4), a marginal change in x has a multiplicative effect on the expected value of Y. So the marginal effect of the β of the independent variable (x) can be summarized as:

If $\beta = 0$, *then* $e^{\beta} = 1$; *implies, no effect on E(Y).*

If $\beta > 0$, *then* $e^{\beta} > 1$; *implies, E(Y) increases as x increases.*

If $\beta < 0$, *then* $e^{\beta} < 1$; *implies, E(Y) decreases as x increases.*

4.2.2.3 Hypothesis (GLMs)

As SMEs are much diverged in their nature of businesses and management operations, a wide range of factors would likely to affect their financing behaviour and decision making process. However, within the scope of survey questionnaires and based on existing studies, theories and conceptual foundation; some firm specific and business operational characteristics as well as manager's competency factors were identified to be likely to explain SMEs' usage of bank services and formal credit.

4.2.2.4 Regression Equation (GLMs)

The base model for both the logit and negative binomial regressions have the functional form as:

$$Access\ to\ Banks'\ Services\ and\ Credit(ABSC)$$

$$= f\begin{pmatrix} firm's\ specific/demograghic\ factors + business\ operational\ factors + \\ managerial\ competency\ factors \end{pmatrix}$$

Thus, the general regression equation could be expressed as:

$$ABSC = \alpha + (\beta_1 region + \beta_2 sector + \beta_3 legal\ status + \beta_4 size + \beta_5 age) +$$

$$(\beta_6 export + \beta_7 import + \beta_8 total\ sale + \beta_9 gross\ margin) + (\beta_{10} gender +$$

$$\beta_{11} experience + \beta_{12} education + \beta_{13} subsidiary) + \epsilon \qquad (5)$$

In this model (equation 5), β_1 to β_5 represent the coefficients of firms' demographic factors, β_6 to β_9 are the coefficients of operational factors, β_{10} to β_{13} coefficients are considered as the managerial competency factors, and the ϵ is the error term of the model.

Chapter 5

ANALYSIS OF THE MACROECONOMIC FACTORS

5.1 Enabling Environment for Banks' lending to SMEs

Recent studies consistently showed that there has been a swift transformation in bank involvement with SMEs started in the mid-2000s (Beck et al., 2008; De La Torre et al., 2010; Fuchs et al., 2011; Jenkins, 2014). De La Torre et al. (2010) mentioned that 93% of banks in Argentina, 100% in Chile, 88% in Colombia, and 100% of banks in Serbia have active SME clients. Jenkins (2014) interviewed 17 major banks in Turkey and found that 16 of the 17 banks had separate SME department. Other similar cross-country evidence shows that the most significant shift in SME finance happened to be in the emerging countries which have also been enjoying high economic growth and economic stability during the same periods. This indicates that the transformation in SME finance is not a coincidence rather it may be a result of improved economic wellbeing that highlights the importance of the enabling environment for SME finance. Here, the term "enabling environment" encompasses inter alia the macroeconomic environment as well as a legal, regulatory and administrative environment that are conducive for the banks to deal with SMEs. Without a favourable economic environment, banking sector will not be able to provide sustainable finance to SMEs. An enabling environment paved the way for providing commercially sustainable finance to SMEs through the competitive banking system.

5.1.1 Macroeconomic Environment Conducive for SME lending

Economic growth, low inflation, and stable exchange rate are generally of most concerned macroeconomic conditions for a business-friendly environment. Economic growth increases the purchase ability of the citizens. With higher income, they consume and demand more goods and services which stimulate firms' production growth and profitability. Increase in income level also increases savings through financial institutions which in turns increase the credit availability for the businesses.

Furthermore, during the economic growth, the government experience surplus or low budget deficit which allows them to avoid inflationary way to finance the deficit such as issuing new money, debt financing and/or using central bank resources. It keeps the inflation rate low and steadies exchange rate. Low inflation and stable real exchange rate make it easier to predict the risk and profitability of the businesses. This helps the banks to assess and price the loan applications with better accuracy. Therefore banks have more incentive to provide medium and long-term loans to SMEs.

5.1.2 Liberalized Financial System

Government interventions on the monetary and financial system distort the market economy and reduce the real rate of growth. The government repressed the financial system in a series of interventions and restrictive measures such as interest rate ceilings, targeted credit scheme, high reserve requirements, foreign exchange control, and capital control. In some extreme level putting a limit to some financial instruments that individuals or financial institutions can hold, namely foreign exchange deposits, investing in international bonds etc.

During the 1970s and 1980s many developing and transition countries' financial system were repressed in order to cheaply finance the budget deficit and public debt. The interest rate on both deposit and loan were kept low to keep the cost of the loan and borrowing low. Low return on deposit instrument discouraged savings, on the other hand, the low-interest rate created excess demand for credit. As a result, the government had to allocate credit to public and prioritized sectors of the economy by the means of targeted credit programs. Capital control was implemented not only to protect national savings but also to limit capital outflows and macroeconomic instability (World Bank, 2005).

MacKinnon (1973) and Shaw (1973) first argued that growth in the financially repressed economy is constrained by savings. Therefore, the government should free interest rate and allow the market to determine the real interest rate. This will lead to an increase in real return to savers which is the key to a higher level of investment thus, ultimately leading to economic growth.

Based on this hypothesis many governments in the developing countries liberalize their interest rates. Financial liberalization today comprises a broader set of measures; in addition to the interest rate liberalization, it also involves a wide set of additional measures including the elimination of directed credits, relaxing reserve requirements, easing of portfolio restrictions on banks, privatizations of banks, enhanced competition among banks, integration of domestic entities to international markets, as well as changes in the restrictive monetary policy.

However, financial liberalization may cause serious banking crisis especially abrupt freeing of interest rate may distress borrowing if the interest rate on loan increased unexpectedly high in real term. The crisis of Latin American countries (Argentina, Chile, and Uruguay) and Turkey in the early 80s are very well-known

examples of this phenomenon. Macroeconomic stability is also a precondition in order to be able to successfully liberalize interest rate and regulatory measure.

5.1.3 Government Borrowing

In order to cover the budget deficit, governments in most developing countries borrow from the domestic financial markets. This reduces the amount of fund available to the private sector; because when government borrowing increases, it is taking away available funds that could otherwise be borrowed by the businesses. In literature, it is known as crowding out effects of government borrowing.

Due to financial liberalization over the 1990s, deposits grew faster in many developing countries. However, bank credit to the private sector grew much less than bank deposits. Access to credit did not expand as it was anticipated after the financial reforms, mainly because the government and central bank debt crowded out the private borrowers. The increased loanable fund was largely absorbed by the public sector (World Bank, 2005).

Some welfare states raise tax level in order to fund social welfare programs leaving less income for individuals and businesses to save or reinvest. Furthermore, when the government funds certain activities such as health and education, there is little scope for businesses and individuals to invest on the relevant businesses such as private hospital, health insurance, private school and universities etc.

Government borrowing also indirectly affects private lending through the increase in risk-free interest rate. In order to borrow more, the government usually raises the rate of return on treasury bills and bonds. The interest rate on Treasury bill is generally perceived as the risk-free return.

According to the capital asset pricing model (CAPM)[8], the interest rate on risky business (R) is equals the risk-free interest rate (Rf) plus a risk premium for the associate riskiness of the business. Ceteris paribus, an increase in risk-free rate will cause the market interest rate to increase. As a result, the private borrowers have to offer higher interest rate above the risk-free rate to cover the associate riskiness and it hurts the small businesses more as they are perceived to be more risky for lending.

5.1.4 Competitive Banking Sector

Financial liberalization and competitive banking system stimulate financial intermediaries which facilitate both saving and investment activities. According to Fry (1988) "Financial intermediaries raise real returns to savers and at the same time lower real costs to investors by accommodating liquidity preference, reducing risk through diversification, reaping economies of scale in lending, increasing operational efficiency, and lowering information costs to both savers and investors through specialization and division of labour" (p. 21).

In the less developed countries (LDCs), lack of competition and inefficient banking system increase borrowing cost and restrict financial access for many firms (Gormley, 2007). In the absence of competition, banks may behave monopolistic, requiring a higher collateral value, higher commission, or even ask for bribery for the risky loans. Therefore, many economists suggest that LDCs should ease the access of new and foreign banks following the footstep of the developed countries such as U.S, Japan, and European communities.

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[8] The CAPM (Sharp, 1963; Lintner, 1965) suggests that the expected rate of return on a risky asset (i.e. stock) derived by adding a risk premium with risk free rate (i.e. treasury rate), and the risk premium varies in direct proportionate to beta in a competitive market.
The equation is $R = Rf + (Rm - Rf)\beta$;Where,
R is the expected return of the stock Rf is the risk free rate and β is the beta coefficient.
Hence, The risk premium = $R - Rf = (Rm - Rf)\beta$
Therefore β measures the associate riskiness of the business or the industry.

Theoretically, bank competition yields lower interest spread of loan and deposit that lead the supply and demand of loanable fund toward market equilibrium thus reduces the deadweight loss due to bank exercise of market power (Cetorelli & Peretto, 2012). In this era of globalization, many developing countries have opened up their market for foreign banks. They increase competition and improve the financial system by introducing innovative ideas and management techniques thanks to their highly skilled and experienced managers. However, Dell'Arricia and Marquez (2004) questions the role of foreign banks in providing SME loans and argued that due to the high cost of acquiring information about the local firms, foreign banks mostly lend to the large and profitable local projects which the author referred as 'cream-skimming'.

Many corporations move from the local banks to the foreign ones due to the ease of foreign transactions and expert advisory service in foreign trade. Thus, the presence of foreign banks increases competition by taking away large corporate clients from the domestic banks forcing them to look for alternatives such as SMEs. Berg and Fuchs (2013) mentioned that most banks lend to SMEs in Kenya and Rwanda partly because of the high competition for corporate clients due to the entry of foreign competitors in the domestic market.

5.1.5 Enabling Legal and Regulatory Environment

Legal and regulatory obstacles are nonfinancial barriers; nevertheless, they affect the SMEs' access to credit. For instance, banks are reluctant to lend in a poor legal system where contract enforcement is difficult, costly, or property rights are very limited. Protection of property rights increases external financing of small firms more than of large firms (Beck et al., 2008). It is also argued that access to external

financing is shaped by a country's legal and financial environment (La Porta, Lopezo-de-Silanex, Shleifer, & Vishny, 1998; Rajan & Zingles, 1998).

The government set the legal and regulatory frameworks to raise tax revenues. In the literature, it is referred to 'the rules of the game' in a society where the government, enterprises and civil society interact with each other. Maintaining these rules increase the cost of doing business and it creates an incentive for informality when imposed irrationally (OECD, 2004). SMEs often lack the capacity of larger firms to negotiate through the complexities of regulatory and bureaucratic procedures.

5.1.6 Eliminate/Reduce Corruption

Enterprise surveys conducted by the World Bank, shows that SMEs in the low and middle-income countries frequently cited corruption as a major problem. In countries with high corruption, it is not unusual to bribe managers or loan officers to get the loan approved which makes the loan expensive. This also encourages serious moral hazards where risky or rigged loans may approve at the cost of good and viable ones. SMEs are more likely to offer bribe since they have less resource and bargaining power to negotiate or simply because they may not comply with all regulations and documentation formalities (IFC, 2010). A corrupted loan officer may endorse loan to rigged projects for their personal benefit at the cost of good ones from potential entrepreneurs.

5.2 Description of the Variables Used in the OLS Regression

This section describes the dependent and explanatory variable used in the OLS regression. The rationale of selecting these particular variables and their relationship with the dependent variable are also discussed here.

Bank lending to the SME sector: the objective of the OLS regression analysis is to find out whether the macroeconomic factors affect the supply of bank loan to the SME sector. Therefore, growth of funds flowing to this sector was regressed in the OLS model. In Turkey, the outstanding loans to the SME sector provided by the commercial banks are published monthly by the BDDK since December, 2006. The monthly loans were converted into quarterly data taking the three months' average within each quarter. Then the nominal amounts were converted into real values by using the CPI = 2003. Then the growth rate was calculated as the percentage change of SME loan from the previous quarter. In the regression analysis, I used 35 quarterly periods from the quarter 4, 2006 to quarter 2, 2015.

GDP growth: it is broadly used as an approximation for the economic growth. During economic growth, many businesses and start-ups flourish and expand. In this process, they require external financing either for working capital or new investment. Also, the increase in disposable income increases domestic savings through financial institutions (FIs). Thus economic growth increases both the demand and supply of loanable funds. Therefore we expect a significant positive relationship with GDP growth and SME credit growth. GDP is measured as value added terms that is the value of the gross output produced less the value of intermediate goods and services used in production. The quarterly growth rates were computed as the percentage change of real GDP from the previous quarter.

Inflation: is frequently used as the indicator of macroeconomic stability. Inflation is an important factor in banks' lending decision. High inflation reduces the real interest income; banks may even experience a negative income. On the other hand, inflation may raise nominal interest rates too high; firms may not borrow or increase the default risk. Furthermore, inflation causes a lot of uncertainty and instability in

the economy and discourages bank in lending to the private sector. Therefore, we would expect a negative impact of high inflation on the growth of SME credit. Inflation rate was computed as the quarterly change of the consumer price index (CPI) where 2003 was the base year.

Government borrowing: quarterly data of the Turkish government's borrowing from the domestic financial market is used for this variable. The nominal amount was deflated by the CPI-2003 then the quarterly growth was measured by taking the percentage change from the previous quarter. An increase in government borrowing is expected to decrease (crowding out) the loanable funds for the private sector. Hence, we can assume a negative correlation between government borrowing and growth of credit to the SME sector. However, for some countries, the assumption may not hold where both public borrowing and private credit may grow together, specially, in the period when there is large capital inflow or adequate supply of loanable funds.

Competition in the banking sector: studies have shown that lack of competition in the banking sector causes higher price for the financial products, less efficiency, and lower access to credit, particularly to the small businesses (Peria, 2010). There are several techniques to measure the competition; among them, market structure approach such as market concentration (CR) and Herfindahl Index (HHI) are commonly used in practice. Market concentration accounts for the share of assets held by the top 3 to 5 banks over the total banking sector asset. This approach is used to analyze competition, based on the assumption called 'Structure-Conduct-Performance (SCP)'. SCP assumes that structure (concentration) influence conduct (behaviour, pricing, market power) and conduct influences performance (greater efficiency, less profit, more competition). In other words, lower concentration leads

to more competitive behaviour and less market power which in turn lead to less profit and greater efficiency (Kocabay, 2009). Scholars also argued that concentration may not indicate the competition; even highly concentrated market can remain competitive. They suggest non-structural metrics to measure the degree of competition such as Panzar and Rosse H-statistic, and the Lerner index. H-statistic infers whether the market is competitive by observing the elasticity of revenue to the cost of the financial products. H-statistic ranges between 0 and 1 where the extremes are, 0 indicating monopoly and 1 indicating perfect competition. The Lerner index measures the market power directly observing the price markup over marginal cost. Higher values indicate a greater market power thus lower degree of competition and vice versa (Peria, 2010).

Bank competition was measured as the ratio of total assets of the five largest banks to the total banking sector in Turkey. In the regression, the five bank concentration (CR5) was used as the indicator of bank competition.

Theoretically, we expect that the decrease in concentration (i.e. increase competition) will be correlated with the increase in credit growth. In Turkey, bank concentration data is available only yearly basis. Therefore, it has been transformed into quarterly data by taking the moving average between the consecutive years[9].

[9] Calculating moving average: first the yearly data were converted into half yearly by taking the midpoints between the years then converted them into quarterly by taking the midpoints between the half year periods.

Chapter 6

ANALYSIS OF THE FIRM SPECIFIC FACTORS

This chapter will describe the firm-level variables used in the GLMs regression analyses and render their theoretical association with SMEs' access to finance. A mix of categorical (nominal, ordinal, dichotomous, polychotomous) and continuous variables were used in these analyses.

6.1 Access to Financial Services and Credit

One of the High-level Principles on SME Financing in the 2015 OECD Report to G20 Finance Ministers and Central Bank Governors was to "Promote financial inclusion for SMEs and ease access to formal financial services, including for informal firms" (OECD, 2015, p. 6, 4th principle). Financial inclusion is synonymous to the use of banks' services which may either be credit or non-credit financial service. Hence, the usage of banks' services was regressed to determine significant indicators for SMEs' access to finance.

6.1.1 Usage of Banks' Products

Using any forms of banks' services involve interactions between banks and customer. According to relationship lending, banks learn more about the customer by actually interacting with them which reduce information asymmetry hence, more likely to lend to their existing customers. On the other hand, by interacting with banks, firms may get the necessary information about the term and benefit of borrowing as well as helpful suggestions of managing funds. Therefore, access to non-credit bank services increases the likelihood of gaining access to credit.

Four qualitative measures were identified as the dependent variables in the binary logistic model, for which responses were “Yes” or “No” category; such that Yes = 1 and No = 0. The questions asked in the survey were as follow:

a) At this time, does this establishment have a checking (current) or savings account?
b) Does this establishment have an overdraft facility?
c) Does this establishment have a loan or line of credit from a financial institution?
d) Did this establishment have recently applied for any loan or line of credit?

6.1.2 Usage of Working Capital and Fixed Assets Financing by Banks

A recent OECD document reported that SMEs are dependent on bank loan (straight debt), as for evidence across the 8 continental European countries, bank loan constituted 23% of the balance sheet of small firms and 20% of medium firm’s; whereas it’s only 11% for large firms (OECD, 2018). Other studies also consistently found evidence that SMEs mostly use bank loan for their external financing. Therefore, analysing the determinants of SMEs’ use of bank loan for financing working capital (short term) and investments (long term) is analogous to that of SMEs’ access to formal credit. It is also important to distinguish the term structure of loan because it is an integral part of any financing decision. According to Graham and Leary (2011), “Many of the relationships evident for leverage also hold for maturity. Firms with longer maturity debt are on average larger, older, more profitable, have more tangible assets, fewer growth opportunities, are less R&D intensive, and have less volatile earnings” (p. 6, para. 2).

Two quantitative response questions were used as the dependent variable in the negative binomial model, representing the use of short and long term credit.

a) Over fiscal year 2014, what proportion of this establishment's working capital borrowed from banks (private and state-owned).
b) Over fiscal year 2014, what proportion of this establishment's total purchase of fixed assets financed by banks (private and state-owned).

6.2 Factors Affecting SMEs' Usage of Financial Services and Credit

Within the scope of WBES survey questionnaire, some characteristics of firms were identified that are most likely to affect their usage and choice of financial services. These factors were carefully selected based on the relevant theories and existing studies. All the independent variables are classified in three categories:

1. Firms' specific/demographic factors,
2. Business operational factors, and
3. Managerial competency factors.

6.2.1 Firms' Specific/Demographic Factors

These are the factors that define a firm's basic identity and formation structure. Almost all the studies addressing access to credit regarded firm's demography as important determinants. In their widely cited paper "The Determinants of Financial Obstacles" Beck et al. studied 10,000 firms from 80 countries. Their findings confirmed that size, age, and ownership of firms are useful priori classifications of financing constraint (Beck et al., 2006). Variables that are considered as firm's demographic factors are explained below:

Region: firm's location is crucial for the availability of source and supply of funds. Generally speaking, firms in the urban location are thought to be less constrained than the rural ones. In the rural or financially less developed regions,

absence or limitation of formal financial institutions led the market to be monopolistic as well as a shortage of available funds. As a result, banks tend to deal with established larger enterprises rather than smaller ones, which are generally perceived as risky and require close monitoring. Being risk averse, banks require higher collateral to secure the loan. So, they prefer to invest in asset-backed/mortgaged loan instead of line of credit/working capital funding. From the demand perspective, SMEs in the rural area generally lack resources or quality assets, lack of financial knowledge to prepare a well-documented proposal or attract alternative source of funds, as well as rigid property rights, make them difficult to obtain or reluctant to seek for formal credit. This explains why SMEs in rural area borrow more from informal sources and/or microfinance organizations especially for their short-term needs.

On the other hand in the competitive environment banks are sales oriented and more aggressive to increase their market share which ultimately leading them to target SMEs (BIS, 2012). From firms' perspective, SMEs such environment generally equipped with better information and knowledge about the financial system which in turns give them better bargaining and more choice of funding sources. Therefore, both the supply and demand of funds are expected to be more efficient in the urban/competitive market than the rural ones.

In the regression models, regional dummies were used to control for the regional/area specific effect that might influence SMEs' access to finance. In the 2015 WBES, the population was stratified by 26 NUTS-2 subregions[10] in Turkey. We regrouped them into 7 broader regions (Table 6.1) to ensure adequate grouped frequency for robust estimation and parsimonious model.

[10] Nomenclature of Territorial Units for Statistics (NUTS), defined in 2002 in agreement between Eurostat and the Turkish authorities. Web link for full list of NUTS statistical regions in Turkey: https://en.wikipedia.org/wiki/NUTS_statistical_regions_of_Turkey (visited-18/04/18).

Business sector: the choice between internal and external finance for investing new project may also depend on the business sector or industry in which the firm operates. From the theoretical perspective, static trade-off theory suggests firm adjust their target debt level, based on their tax burden and financial vulnerability. Hence, their target debt level would vary for different industries as tax rate as well as the assets type and riskiness varies for different sectors (Myers, 1984). For instance, manufacturing and construction sectors are equipped with heavy machinery and tangible assets, so SMEs in these sectors are likely to rely more on long-term external finance for their capital investment. In contrast, retail and other service sectors may prefer internal or short term finance as they mainly depend on intangible and human resources rather than material.

The availability of funds and loan condition may also differ based on the type of business sector. For instance, (in some countries) banks may be obliged to prioritize or alleviate conditions to farming and agro-business sectors. Similarly, some economies are more driven to the certain type of industries; thus, firms in these sectors find it much easier to access bank financing (e.g. textile, garments, and leather industry in Bangladesh).

Sector variable was used as a multinomial category (sectorial dummies) in order to control and compare the sectorial differences. The population was stratified into 8 sectors (4 manufacturing and 4 services) which were further consisted with one or more relevant industry following "NACE Rev.2 codes"[11].

1. Food products Manufacturing (NACE codes 10),
2. Textiles and wearing apparel Manufacturing (NACE codes 13 and 14),

[11] NACE (Nomenclature of Economic Activities) is the European statistical classification of economic activities; see the full list of NACE Rev. 2 industry code: http://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF (visited-18/04/18).

3. Fabricated metal, machinery and motor vehicles Manufacturing (NACE 25, 28, 29),
4. Other manufacturing (NACE 11, 12, 15-24, 26, 27, 30-32),
5. Construction Services (NACE 41, 42, 43),
6. Wholesale and Retail Services (45, 46, 47),
7. Transport Services (49, 50-53), and
8. Tourism & other services (NACE codes 33, 55, 56, 58, 61, 62, 79, and 95).

Legal status/ownership type: type of ownership and legal status of the business largely characterized by their choice and source of finance. For example, starts up and sole proprietorships are primarily financed by personal and/or family funds and for external credit they mainly seek for the bank loan. On the extreme opposite side public corporation has the ability to issue equity, corporate bonds or a mix of hybrid securities to raise required fund for their investment opportunities. Some studies distinguished ownership type as domestic, foreign and state-owned firms. Beck et al. (2006) found that foreign-owned firms reported significantly lower financial obstacles whilst government-owned firms reported higher financial obstacles.

Among the WBES surveys sample firms, 99.4% of the SMEs were domestic private owned; whereas, the relative frequencies of the foreign and state-owned firms were too low at 0.3% and 0.03 % respectively. So, this dimension of ownership type was not considered in the regressions analyses to retain a large degree of freedom and robust computation.

Instead, I used firm's legal status which was distinguished in eight categories. Again, some of those categories had no or very low frequency for SMEs. Since highly unbalanced group size can distort the model fit, we regrouped them into three main categories such that:

1. Sole proprietorship,
2. Partnership (included: partnership and limited partnership divided into shares), and
3. Corporation (included: shareholding company with shares traded in the stock market, shareholding company with non-traded shares or shares traded privately, limited liability company, cooperative company, commandite company, and collective company).

Size and age: size and age of the firms are widely used in empirical studies as a common proxy for opacity and information asymmetry. The general consensus is that older and larger firms might have better access to formal credit as they are equipped with sufficient resource, better track record, and relatively more professional and experienced managerial knowledge. Moreover, larger and older firms tend to be more diversified and less likely to fail which may serve as an inverse proxy for the probability of bankruptcy (Rajan and Zingales, 1995). For similar reasons, starts-ups or relatively younger and smaller firms are perceived to be more opaque. Consequently, they are subject to adverse selection and moral hazard problem, driven by the higher information asymmetry; hence, more likely to face financial obstacles. Therefore, size and age are expected to have a positive association with access to credit or negative with credit constraint. As evidence, Beck et al. (2006) found that older and larger firms reported financially less constrained. Kuntchev et al. (2012) found size was significant determinants of credit constraint where both the size and age of firms were negatively associated with the probability of being credit constrained, however, age was not statistically significant.

Firm's size was measured as the number of permanent full-time employees working at the time of the survey.

The age of the firm was deduced from the beginning year of operation up to the survey year. Both of the size and age variables were smoothed with the natural log for robust estimations.

6.2.2 Business Operational Factors

Two measures of operating income (sales revenue and gross profit margin) and two measures of business operations (importing and exporting) were considered under this classification. Both operating earnings and foreign trade (import/export) can be associated with the use of bank services and credit.

As discussed in the literature review, static trade-off theory and pecking order theory suggest contradictory predictions about the firm's profitability and financing choice. Where, the former theory relates more profitable firms should use more debt financing to shield tax cost; whilst, the later one suggest that more profit/earnings should provide sufficient internal funds which should be used first as it is the cheapest one. However, SMEs operate more often in the informal environment so they are more concern about the cost and availability of debt financing rather than tax shielding. Hence, we expect they might follow the pecking order financing choice rather than to maintain a targeted debt ratio (trade-off theory).

Firms' involvement with importing/exporting activities may also require a bank guarantee (i.e. letter of credit) or other forms of financial services. Hence, importing/exporting firms are more likely to involve with the formal financial system.

Total sales: total sales in local currency at the end of the fiscal year 2014. In the regression, we used the natural log of total sales. Beck et al. (2006) use log of sales as an alternative proxy for firm's size along with the number of employees.

Gross margin: it is the ratio of last fiscal years' gross profit over the total sale. Where, gross profit was computed as the difference between total sales and cost of goods sold for the same period. It was included as a standardized operating performance measure which is comparable across the size and industry or other differences of the firms' characteristics.

Exports and Imports: export dummy takes "1" if the firm exports directly or indirectly (sold domestically to the third party that exports products), and "0" if not. Similarly, importing firms (directly imports their inputs or supplies) takes "1" and "0" for non-importing firms.

6.2.3 Managerial Competency Factors

The term managerial competency refers to the type of knowledge, skills, and qualities which are associated with effective management and leadership (Martin & Staines, 1994). Business growth and sustainability largely depend on the entrepreneur's personal traits and relevant knowledge. It is even more evident for the sole proprietorships, where, most of the business and financing activities reflect owner's ability and capacity. As most SMEs are either individual or family owned, lenders tend to assess not only the proposed project but also the owner's competency to carry out the project successfully. By surveying 62 commercial banks in 5 Sub-Saharan African Countries Berg and Fuchs (2013) found that banks perceived, poor quality of financial statements and business plan, as well as lack of business skill, were among the important firm-specific obstacles in doing business with SMEs; which could be attributed to the managerial incompetence. The variables that were considered to be relevant under this classification are described below.

Gender of the top manager: gender discrimination and SME financing gap have a common feature in the sense that both issues have been identified and addressed

intensively both in the literature and research for decades. Despite the global awareness and persistent effort to alleviate gender inequality and financing gap they still face unfair challenges and obstacles especially in the developing and third world countries. Nanyondo (2017) summarized three hypothetical reasoning for the possible gender gap in access to formal credit from other relevant studies (Aterido, Beck, & Iacovone, 2013; Beck, Behr, & Madestam, 2011; Buvinic & Berger, 1990).

- **Taste discrimination:** financial system is traditionally men dominated; hence, it is not a level playing field for women.
- **Statistical discrimination:** women entrepreneurs (mostly micro or smaller business in developing and under developed countries) are among the lower literacy and lower involvement in the formal market; so, they face more obstacles to access to formal credit.
- **Traditional role in society:** The traditional viewpoint "women focused on household activities and men focused on market economies" might also restrict women with lower involvement in the formal financial market.

Furthermore, in explaining the variation of women's financial inclusion in developing countries, Demirguc-Kunt, Klapper, & Singer (2013) suggested that women may also face legal discrimination and gender norms (i.e. heritance and property right).

In the regressions, gender dummy takes "1" if the top manager is a female and "0" for the males.

Years of experience: in their study of "Managerial Competences in Small Firms" Martin and Staines (1994) surveyed 150 small business owner/managers in Scotland; the author summarized the perception of the majority of managers in the survey stressing that "a sound technical understanding of their industry derived from long

experience within it", noting their managerial role as a "craft" which is best developed on-the-job that cannot be taught in an off-the-job setting (p. 31).

Entrepreneurial/managerial experience generally associates with business growth and seizing opportunities, however, it is also as important in accessing formal credit. It is often expected that more experienced managers are likely to have a relationship network with peer group, banks or other business associations (e.g. chamber of commerce, micro finance schemes etc.). Hence, they are more likely to be aware of the source and benefit of external financing. Moreover, previous experience of seeking formal credit or knowledge of loan application process may boost their confidence and ability to apply for new loans.

Experience was measured as the number of years that the top managers have experience of working in this sector. It is also smoothen by logarithmic transformation in the model.

Level of education: no quality measure of human capital would be complete without some form of education involve in it. In the empirical research the level of education along with relevant work experience are used as a proxy measure for managerial competency. A telephone survey of 400 SMEs in the UK, Irwin and Scott (2010) revealed that graduates faced least difficulties in raising bank finance. The author provided three plausible reasoning; firstly, more educated entrepreneurs have the ability to present strong business plan and necessary information also maintain better relationship with financial institutions. Secondly, more educated managers are also likely to effectively manage other essential functions of the business (finance, marketing, human resource etc.) which in turns help them easier access to finance. The third point was made from the supply perspective where the lenders asses the education level of the loan applicant as an important criterion. Pandula (2011) found

manager's education level and networking (being a member of chamber of commerce) are the only statistically significant factors of access to bank loan for SMEs in Vietnam.

In the survey, top manager's highest completed educational degree was a free end question. For simplicity we arranged them as ordered category in to five distinguished level:

1. Primary level (also included those who didn't have formal education or never attended school),
2. Secondary level (secondary level included high school, vocational, associate and some college education),
3. Bachelor degree (also included unspecified university education, where respondent didn't mention which level of university degree were completed),
4. Master's degree, and
5. Post graduate/PhD degree.

Subsidiary: a subsidiary firm is a part of a larger firm that are owned or controlled by the parent/holding company. The rationale for considering it in this classification is that, subsidiary firms are benefited with professional and experienced managerial consultancy from their parent firms. Hence, it is expected to have a positive association with access to finance.

Subsidiary is a dummy variable that takes "1" if the firm is part of a larger firm, and "0" otherwise.

6.3 Descriptive Analyses of the Firm-Level Surveys in Turkey

Table 6.1: Usage of bank services by SMEs across the regions and sub-regions.

Usage of Bank Services (%) ▸	Have a bank account		Overdraft facility		Have a loan		Applied for loan	
Regions & sub-regions ▾	No	Yes	No	Yes	No	Yes	No	Yes
1) Istanbul Region	10	90	52	48	72	28	84	16
Bursa, Eskisehir, Bilecik	18	82	67	33	70	30	80	20
Kocaeli, Sakarya, Duzce, Bolu, Yalova	22	78	60	40	79	21	71	29
Tekirdag, Edirne, Kirklareli	39	61	55	45	62	38	68	32
Balikesir, Canakkale	42	59	82	18	74	26	91	9
2) Marmara Region (average)	30	70	66	34	71	29	77	23
Zonguldak, Karabuk, Bartin	71	29	52	48	68	32	87	13
Samsun, Tokat, Corum, Amasya	31	69	42	58	69	31	85	15
Kastamonu, Cankiri, Sinop	36	64	50	50	61	39	70	31
Trabzon, Ordu, Giresun, Rize, Artvin, Gumushane	60	40	63	37	58	42	74	26
3) Black Sea Region (average)	49	51	52	48	64	36	79	21
Izmir	52	48	66	34	78	23	77	23
Antalya, Isparta, Burdur	30	70	62	38	76	24	80	20
Aydin, Denizli, Mugla	44	56	61	39	52	48	57	43
Manisa, Afyon, Kutahya, Usak	42	58	57	44	57	43	64	36
4) Aegean Region (average)	42	58	61	39	66	34	70	30
Ankara	3	97	58	42	68	32	74	27
Kayseri, Sivas, Yozgat	67	33	63	37	75	25	79	21
Kirikkale, Aksaray, Nigde, Nevsehir, Kirsehir	70	30	78	22	68	32	81	19
5) Central Anatolia Region (average)	47	53	66	34	70	30	78	22
Erzurum, Erzincan, Bayburt	89	**12**	85	**15**	84	17	95	**6**
Malatya, Elazig, Bingol, Tunceli	82	**18**	91	**9**	74	26	92	**8**
Agri, Kars, Igdir, Ardahan	93	**7**	83	**17**	71	30	93	**8**
Van, Mus, Bitlis, Hakkari	73	27	74	26	82	18	90	**10**
6) East Anatolia Region (average)	84	**16**	83	**17**	78	22	92	**8**
Konya, Karaman	85	**15**	91	**9**	89	**11**	93	**7**
Adana, Mersin	66	34	61	39	57	43	68	32
Hatay, Kahramanmaras, Osmaniye	86	**14**	83	**17**	73	27	88	12
Gaziantep, Adiyaman, Kilis	79	**22**	82	**18**	80	20	91	**9**
Sanliurfa, Diyarbakir	57	43	82	**18**	80	20	85	15
Mardin, Batman, Sirnak, Siirt	78	**22**	76	**24**	87	**13**	97	**3**
7) Southeast Anatolia/Mediterranean	75	**25**	79	**21**	78	22	87	**13**

Source: Constructed from the 2015 WBES survey in Turkey.

Note: Istanbul was considered as a region, the figures of the other six regions are the average values of their respective sub-regions within each region. All the numbers are expressed as percentage of total number of SMEs within each category.

Table 6.1 shows the usage of bank products (also used as the dependent variables in the logistic regression) by decomposing the 7 regions into 26 sub-regions in Turkey. This table helps us precisely point out the regions and subregions that are financially constrained or less inclusive. It's noticeable that some sub-regions in the East and Southeast Anatolia were rarely using banks account and overdraft facilities. As we can see that only 7% of SMEs in Agri, Kars, Igdir, Ardahan have a bank account and in Malatya, Elazig, Bingol, Tunceli, Konya, Karaman subregions only 9% of SMEs said to have overdraft facility; whereas, 90% SMEs in Istanbul and 97% in Ankara were using bank accounts.

Table 6.2: SMEs with a bank account are more likely to apply for bank loans

		SMEs without a bank account		SMEs with bank account	
		frequency	percentage	frequency	percentage
Have applied for a loan	No	2240	88	1969	75
	Yes	305	12	652	25
	Total	2545	100	2621	100

Source: Constructed from the 2015 WBES survey in Turkey.

The contingency table (Table 6.2) shows that 25% of SMEs with a bank account (saving or checking) has recently applied for a loan; whilst, it is only 12% without a bank account. Therefore, it can be said that having a bank account increases the probability of having access to credit almost twice than those without a bank account.

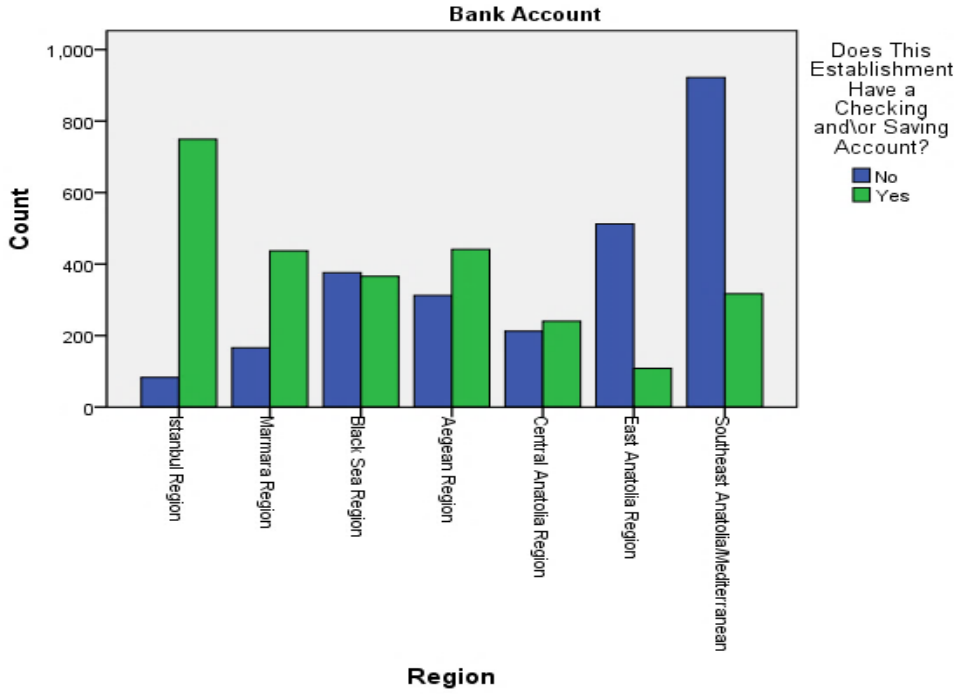

Figure 6.1: Use of bank accounts by SMEs across the regions in Turkey
Source: Calculated from the 2015 WBES survey in Turkey.

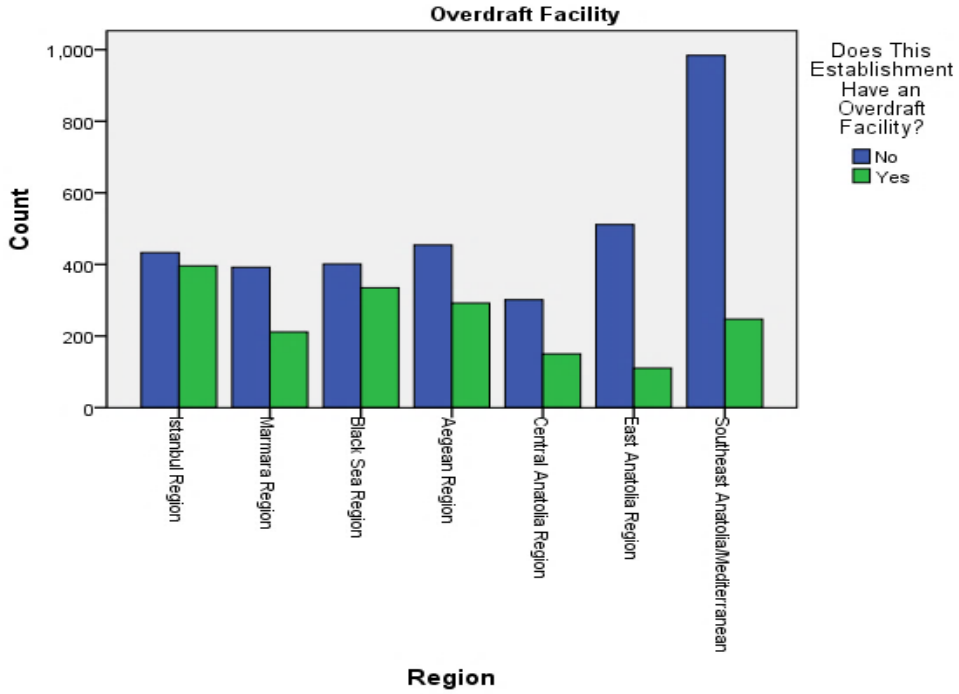

Figure 6.2: Use of overdraft facility by SMEs across the regions in Turkey
Source: Calculated from the 2015 WBES survey in Turkey.

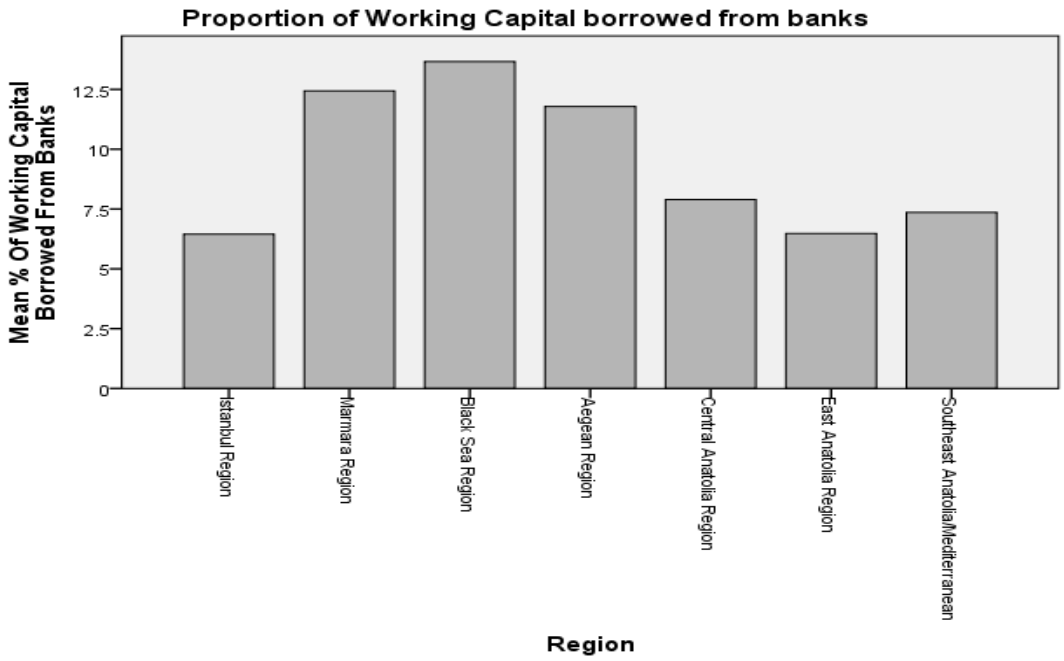

Figure 6.3: Proportion of working capital borrowed from banks across the regions
Source: Calculated from the 2015 WBES survey in Turkey.

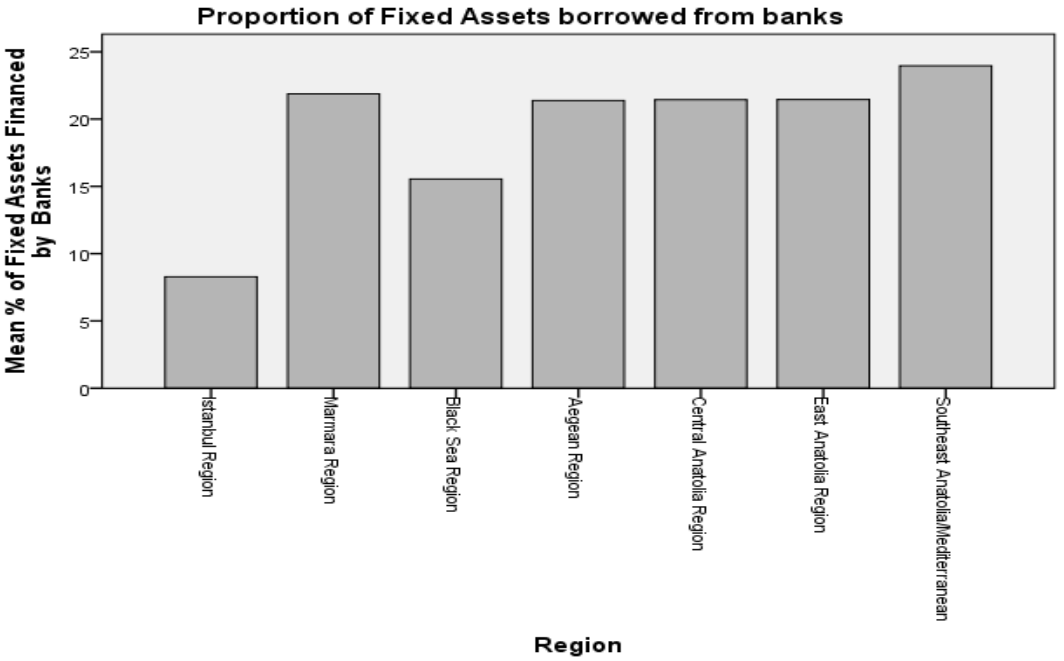

Figure 6.4: Proportion of fixed asset funded by banks across the regions
Source: Calculated from the 2015 WBES survey in Turkey.

The clustered bar charts (Figure 6.1 & 6.2) illustrate the regional differences in the use of bank account and overdraft facility. The proportion of working capital and fixed assets financed by banks are shown in (Figure 6.3 & 6.4) By closely monitoring these charts, we can see that SMEs in the Anatolian (Central, East & Southeast) region, were among the least users of bank account and overdraft facility. Nevertheless, they were borrowing a relatively higher proportion of fixed assets from banks than more developed regions. One plausible reason might be that in rural or financially less developed area, SMEs mostly seek for the bank loan for investing purpose and prefer to finance working capital with internal or informal sources. On the supply point of view, it is also possible that banks are rationing their fund only to the assets backed loans (fixed assets) rather than cash-flow based financing (working capital) as the later one is perceived to be riskier.

Table 6.3: Application for new loan/line of credit across the surveys in Turkey

		Overall		Large		SME	
Year	Applied	Frequency	Percent	Frequency	Percent	Frequency	Percent
2015	No	4666	79.8	418	67.2	4248	81.3
	Yes	1178	20.2	204	32.8	974	18.7
	Total	5844	100	622	100	5222	100
2013	No	789	62.4	141	57.6	648	63.5
	Yes	476	37.6	104	42.4	372	36.5
	Total	1265	100	245	100	1020	100
2008	No	503	44.1	120	36.7	383	47.1
	Yes	638	55.9	207	63.3	431	52.9
	Total	1141	100	327	100	814	100
2005	No	556	42.1	173	34.6	383	46.6
	Yes	766	57.9	327	65.4	439	53.4
	Total	1322	100	500	100	822	100

Source: WBES surveys in Turkey in 2005, 2008, 2013, and 2015.

Table 6.3 shows the responses of the sample firms for which they were asked "whether they applied for a new loan or line of credit during the last fiscal year of the respective surveys". Overall, the loan application has decreased significantly from about 58% in 2005 down to just over 20% in 2015, it is even less for SMEs at 18.7% compared to large firms at 32.8%. Therefore, it is obvious that the demand for loanable funds has declined in recent years. OECD (2017) also stressed about weaker demand across other emerging countries that "The investment climate and weak demand for credit may be contributing to holding back a stronger recovery in SME lending".

Table 6.4: Outcome of the most recent loan application

		Overall		Large		SME	
Year	Outcome	Frequency	Percent	Frequency	Percent	Frequency	Percent
2015	rejected	69	6.1	1	0.5	68	7.3
	approved	1064	93.9	197	99.5	867	92.7
	Total	1133	100	198	100	935	100
2013	Rejected	12	2.7	2	2.1	10	2.9
	approved	432	97.3	92	97.9	340	97.1
	Total	444	100	94	100	350	100
2008	Rejected	100	16	30	14.9	70	16.5
	approved	526	84	171	85.1	355	83.5
	Total	626	100	201	100	425	100

Source: WBES surveys in Turkey in 2008, 2013, and 2015.

Table 6.4 presents the outcome of recent loan applications by SMEs over the period from 2008 to 2015. It also compares the outcomes between the large firms and SMEs. The overall rejection rate was higher in 2008 at 16%; then, it decreased significantly to just over 6% for all firms, and over 7% for SMEs. This low rejection rate consistent with a recent OECD report which mentioned that SMEs have found it easier to access credit in recent years (OECD, 2018). We can also see that employee

size matters for the access to bank finance; compared to large firms, SMEs had higher rejections, although the differences were not substantial.

Table 6.5: Turkish SMEs' main reasons for not applying for new loans

Year ▸	2015		2013		2008		2005	
Reasons ▾	N	%	N	%	N	%	N	%
No need for a loan/sufficient capital	2947	70.9	545	87.3	304	79.6	278	72.6
Application procedures were complex	90	2.2	5	0.8	11	2.9	9	2.3
Interest rates were not favourable	594	14.3	40	6.4	35	9.2	50	13.1
Collateral requirements were too high	108	2.6	6	1	4	1	17	4.4
Insufficient loan size and maturity	73	1.8	7	1.1	6	1.6	1	0.3
Required informal payments			1	0.2	3	0.8	2	0.5
Did not think it would be approved	98	2.4	9	1.4	5	1.3	2	0.5
Other	249	6	11	1.8	14	3.7	24	6.3
Total	4159	100	624	100	382	100	383	100

Source: WBES surveys in Turkey in 2005, 2008, 2013, and 2015.

Table 6.5 shows the main reason for which SMEs did not apply for a new loan/line of credit. Over 70% SMEs, mentioned either they did not need for a loan or had sufficient internal/own capital. However, it also means that the remaining 30% did require external financing but were constrained by some sort of barriers. Among them, the interest rate was the most cited one as high as 14.3% in the 2015 survey. It is also noticeable that in the same survey, 2.6% SMEs complaint about the higher collateral requirement and 2.4 % SMEs thought themselves as ineligible to obtain a bank loan. Over 2% of SMEs, has cited the complexity of loan application procedure which was similar 10 years ago in the 2005 survey. However, the complaint about the insufficient loan maturity has been increased in the recent surveys.

Table 6.6: SMEs' self-reported biggest obstacles to business operation over the years

Survey Year ▸	2015		2013		2008	
Obstacles ▾	Freq.	Percent	Freq.	Percent	Freq.	Percent
Access to finance	767	16.2	97	11.2	208	26.5
Access to land	55	1.2	15	1.7	4	0.5
Business licensing and permits	131	2.8	13	1.5	26	3.3
Corruption	102	2.2	39	4.5	15	1.9
Courts	13	0.3	6	0.7	5	0.6
Crime, theft and disorder	60	1.3	8	0.9	7	0.9
Customs and trade regulations	68	1.4	6	0.7	15	1.9
Electricity	111	2.3	71	8.2	27	3.4
Inadequately educated workforce	462	9.8	41	4.7	66	8.4
Labour regulations	178	3.8	10	1.2	13	1.7
Political instability	471	10	97	11.2	133	16.9
competitors in the informal sector	538	11.4	175	20.3	107	13.6
Tax administration	199	4.2	19	2.2	5	0.6
Tax rates	1387	29.4	239	27.7	143	18.2
Transport	183	3.9	28	3.2	11	1.4
Total	4725	100	864	100	785	100

Source: WBES surveys in Turkey in 2008, 2013, and 2015.

Table 6.6 shows the response of SMEs, when they were asked; "which of the elements of the business environment (included in the list) if any, currently represents the biggest obstacle faced by this establishment"? Among the given list of 15 obstacles, tax rate was mostly mentioned as the biggest one since 2013. Although only 16.2% of SMEs perceived access to finance as their biggest obstacle, it is the second most cited one in the 2015 survey; As a matter of fact, in the 2008 survey, it was the most cited obstacle at 26.5 %. Given the worldwide credit crunch during the 2007-2008, it is no surprise that firms were more likely to be financially constrained at that time. Political instability and inadequate educated workforce were other two notable obstacles which were mentioned by 10% of the participated SMEs in the 2015 survey. While political instability is decreasing since 2008, the lack of an educated workforce is hurting more firms in recent years. Labour regulations and

transport barriers were among the other growing concern that an increasing proportion of SMEs is being affected in recent years.

Table 6.7: Source of funds over the years*

		% Working Capital funded by				% Fixed Assets funded by				
Year	Size	Internal	Banks	Trade credit	Informal	Equity	Internal	Banks	Trade credit	Informal
2015	Large	79.2	13.7	5.3	1.9	5.5	70.4	21.4	1.5	1.2
	SME	85.2	9.2	3.6	1.9	4.3	73.0	18.7	1.6	2.4
2013	Large	67.3	18.4	9.7	2.8	6.8	56.9	27.0	4.0	3.5
	SME	71.7	16.9	6.8	3.2	5.5	59.7	27.3	2.1	2.6
2010	Large	59.6	23.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A
**	SME	55.9	16.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2008	Large	N/A	N/A	N/A	N/A	4.5	53.5	36.6	3.4	1.8
**	SME	N/A	N/A	N/A	N/A	5.1	53.7	37.8	2.0	1.3
2005	Large	44.4	36.8	6.7	3.6	7.8	45.7	25.0	3.9	17.5
	SME	52.8	30.3	4.3	4.9	7.0	53.4	24.3	3.2	12.1
2002	Large	74.7	9.9	2.2	13.2	3.9	75.6	13.0	0.5	7.0
	SME	80.0	7.2	1.5	11.3	0.4	80.8	12.0	0.0	6.8

Source: WBES surveys in Turkey in 2002, 2005, 2008, 2010, 2013, and 2015.
* The type of bank and alternative funding sources were not same for the different WBES surveys. So this table was prepared with some adjustments to make it comparable across the surveys. Such that "banks column" included private commercial, foreign owned/branch and state/government banks, "equity" referred to owner's contribution both old and new funds so that it doesn't distinguish between personal funds or raising through share issuance. Also, Equity was not an option for the working capital finance but for investing fixed assets in the survey.
** The question regarding "source of working capital" was not included in the 2008 WBES in Turkey. Instead, we extracted that information from the WBES 2009-2010 also called the "financial crisis survey" which was not standardized with other periods. So the other information was not comparable in the financial crisis surveys.

Table 6.7 shows the financing sources of both working capital and fixed assets from 2002 to 2015. As we can see, over the past few years, bank financing has decreased both for working capital and fixed assets. It is also clear that SMEs largely finance their working capital with retained earnings and use more external financing for the fixed assets. What is notable here is that, there was not much difference between SMEs and large firms in using bank financing for fixed assets, however, for

financing working capital SMEs borrow less than the large firms. It also provides evidence that over the years, SMEs use of trade credit has increased yet large firms use it even more. Finally, as opposed to a general view that SMEs use more informal funds than the large firms, this table does not provide such statistics rather it shows quite the opposite.

Figure 6.5 and Figure 6.6 illustrate SMEs' use of bank loans for their working capital and fixed assets investment over the period of 2002 to 2015. We can see that both working capital and fixed asset financing by banks have decreased in the most recent survey 2015, which had been increasing since 2002 until 2013. In the same periods the reverse pattern can be seen for using internal funds for financing working capital and fixed assets. BIS (2012) revealed a very similar trend for bank lending to SMEs in the UK. The same paper also pointed the credit crunch of 2008, by reasoning that it has affected lending by both demand and supply-side factors. In the UK, the value of new loan applications by SMEs was decreased by 19% lower in February 2011, than the previous year. On the other hand, as aftermath of the global financial crisis, banks now become more cautious in assessing the risky loan applications.

For Turkey, one plausible reason for the recent decline of the demand for bank loans may be due to the regional conflict and political tension going on for past few years. Such as "Istanbul Gezi Park" mass protests in 2013, corruption crackdown against top public officers in 2014, and failed army coup against the government in 2016 as well as Turkey's active involvement in regional conflict such as Syrian war and war against the ISIS and PKK. These unrest events might have deteriorated the market confidence of the investors and hindered the businesses environment in recent years.

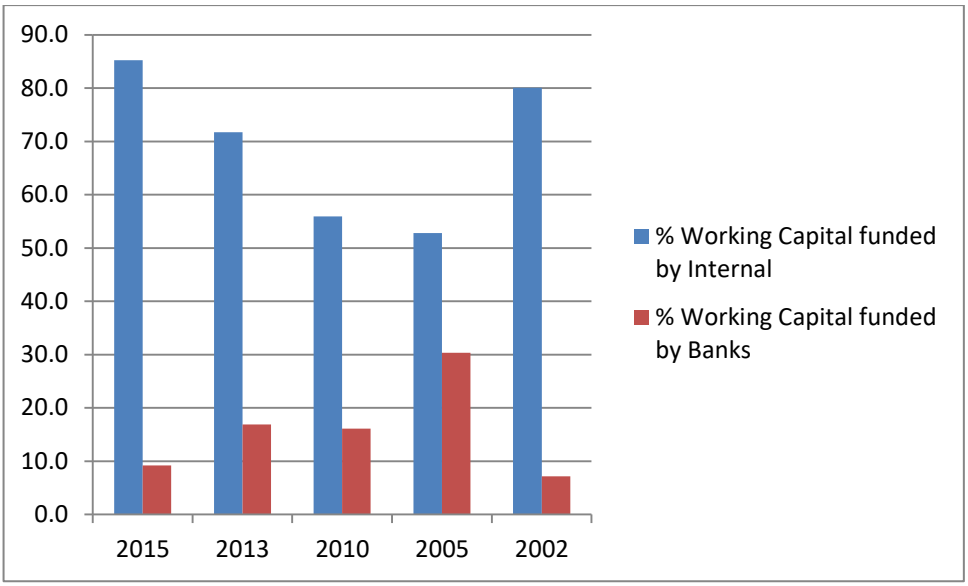

Figure 6.5: SMEs proportion of working capital financed by bank vs. internal
Source: WBES surveys in Turkey in 2002, 2005, 2010, 2013, and 2015.

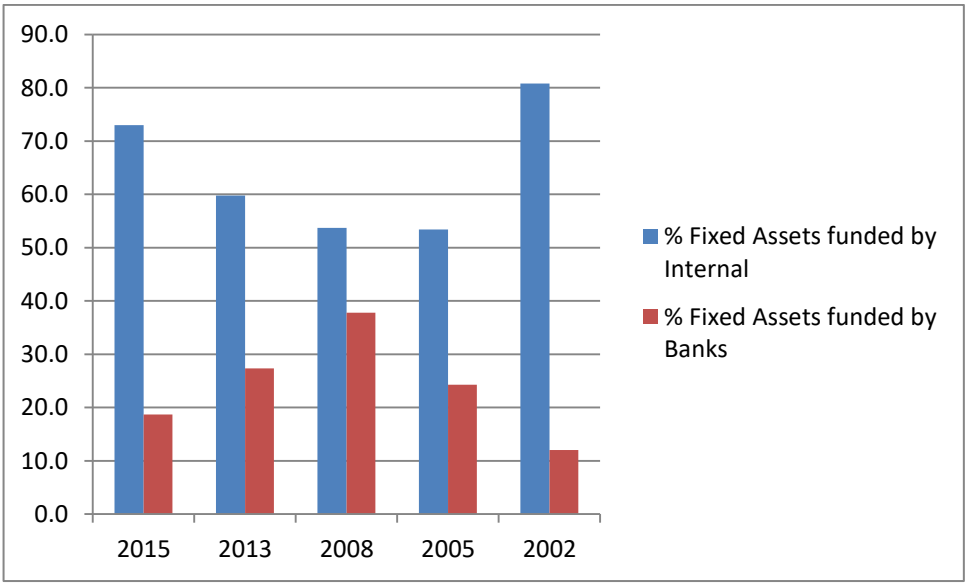

Figure 6.6: SMEs proportion of fixed assets financed by bank vs. internal
Source: WBES surveys in Turkey in 2002, 2005, 2008, 2013, and 2015.

Chapter 7

REGRESSION RESULTS AND EXPLANATIONS

7.1 Regression Results and Explanations (OLS)

Table 7.1: Regression result, growth of SME credit as dep. variable (OLS)

Ind. variables	*Coefficients*	*Std. Error*	*t Stat*	*P-value*
Intercept (C)	3.75	1.19	3.14	0.00***
GDP growth	0.87	0.31	2.78	0.01***
Inflation	-0.92	0.48	-1.92	0.06*
Gov. Debt	-0.26	0.12	-2.29	0.03**
Bank CR5	-0.49	0.59	-0.83	0.41

N= 35 (quarterly periods from 2006_Q_4 to 2015_Q_2)
R^2 = 0.32, Adjusted R^2 = 0.23, *F*-statistic = 3.52 (Prob = 0.01***)
***coefficient is significant at $\alpha \leq 1\%$, **coefficient is significant at $\alpha \leq 5\%$, *coefficient is significant at $\alpha \leq 10\%$.
Note: All the variables are expressed as quarterly growth that is the percentage change from the previous quarter.
Source: Calculation based on the data collected from BDDK, TUIK, OECD, and the World Bank.

Table 7.2: Regression result with the lag effect of SME credit growth (OLS)

Ind. variables	*Coefficients*	*Std. Error*	*t Stat*	*P-value*
C	2.58	1.079	2.39	0.02**
SME (−1)	0.48	0.13	3.55	0.00***
GDP growth	0.73	0.27	2.68	0.01***
INFLATION	−0.99	0.41	−2.40	0.02**
GOVDEBT	−0.19	0.10	−1.82	0.07*
Bank CR5	−0.36	0.56	−0.64	0.52

N= 34 (quarterly periods from 2006_Q_4 to 2015_Q_2)
R^2=0.53, Adjusted R^2=0.45, *F*-statistic=6.33 (Prob = 0.00***)
***coefficient is significant at $\alpha \leq 1\%$, **coefficient is significant at $\alpha \leq 5\%$, *coefficient is significant at $\alpha \leq 10\%$.
Note: All the variables are expressed as quarterly growth that is the percentage change from the previous quarter.
Source: Calculations based on the data collected from BDDK, TUIK, OECD, and the World Bank.

The results of the OLS regression (Table 7.1) provide statistical evidence of the hypothesis that the growth of commercial bank lending to SMEs is stimulated by GDP growth, economic stability (low inflation), and reduced government borrowing.

As expected, GDP growth is positively associated with the growth of SME lending; whereas, inflation affects it negatively. Assuming other factors remain unchanged, a 1% increase in quarterly GDP growth contributes 0.87% of the quarterly growth of SME loan. On the contrary, it shrinks by a similar unit (0.92%) due to the inflationary effect alone. Government borrowing is also statistically significant and the coefficient is negative. The coefficient 0.26 implies that if the growth of government borrowing decreases by 1%, SME loan growth will increase by 0.26% each quarter. Bank concentration (Bank CR5) is negatively related with the growth of SME loan; in other words, we can say that bank competition is positively related; since less concentration means a higher level of competition. However the coefficient of Bank CR5 is not statistically significant. Nevertheless, this does not necessarily mean that bank competition has no effect on the growth of SME lending; rather, it extensively improves the coefficient of determination (R^2) of the model. The coefficient came out as insignificant may be because the concentration ratio does not fully capture the competition.

A more representative measure of competition such as the non-structural approach that considers entry and exit barrier, ease of foreign banks' entry, and other competitive market behaviour, might increase the level of significance. Due to the complexity and the data limitation, this type of approach of measuring competition is beyond the scope of this study.

7.1.1 Robustness

Although the F-statistic (3.52) is statistically significant at the alpha 1% significance level, the coefficient of determination R^2 (0.32) and the adjusted R^2 (0.23) are not very high. These low R^2 values indicate that there may be some missing variables in this model, such as interest rates, or other factors that influence banks' lending to SMEs.

First, we attempt to improve the model by adding the real interest rates as an independent variable. However, the regression results remain the same without any significant improvement in the R^2 and the adjusted R^2.

Second, we include one period lagged value of the dependent variable, SME credit growth, SME(-1), as a control variable (Table 7.2). This improves the robustness of our model significantly, with the R^2 becoming 0.53 and the adjusted R^2 0.45. Also, the estimated coefficient of the SME(−1) is positive and significant at the 1% level. This finding shows that the current SME credit growth rate is positively and significantly affected by its own one period lagged value. This lag effect is likely to be the result of banks' strategic expansion in the SME market in Turkey. Over the past decade, banks have been investing in their SME lending infrastructure, such as the branch network, personnel, IT infrastructure, and financial products for servicing SMEs. It is very likely that these developments will have a prolonged effect on banks' SME credit growth in Turkey.

Further residual tests were carried out using E-Views software. Among them, the Jarque-Bera normality test result confirmed that the residuals were normally distributed; the Breusch-Pagan-Godfrey test found no heteroskedasticity and the LM test also confirmed that there was no auto/serial correlation. Therefore, the model fitted well for this regression analysis and the results are robust.

Correlation analysis allows us to check for the multi-colinearity problem within the independent variables. It is apparent in the correlation matrix (Table 7.3) that there is no significant association within the independent variables, in other words, there is no multi-collinearity in this model.

Table 7.3: Pearson correlation matrix

	SME loan	GDP growth	Inflation	Gov. debt	Bank CR5
SME loan	1				
GDP growth	0.382**	1			
	(0.049)				
Inflation	−0.256	−0.101	1		
	(0.198)	(0.615)			
Gov. debt	−0.258	0.275	−0.193	1	
	(0.194)	(0.165)	(0.334)		
Bank CR5	−0.108	−0.016	−0.045	−0.124	1
	(0.594)	(0.937)	(0.824)	(0.537)	

**Correlation is significant at the 0.05 level (2-tailed)

Note: All the variables are expressed as quarterly growth that is the percentage change from the previous quarter.

Source: Calculations based on the data collected from BDDK, TUIK, OECD, and the World Bank.

7.2 Regression Results and Explanations (GLMs)

SPSS software was applied to carry out GLMs regressions. The following sub-sections present the regression results and statistical interference about the estimated parameters as well as their interpretations.

7.2.1 Model Effect

The table of model effect (Table 7.4) lists the variables used in the GLMs regressions along with their statistical significance test statistics. Statistical significance of categorical and continuous predictors was identified using the

significant test called "Wald test statistic".[12] The "Wald (χ^2)" columns present Wald chi-square test values with their degree of freedom to the next in "D.F." columns. "Sig." columns report the critical p-values at which the null hypotheses can be rejected also known as alpha (α) level. From this table we can see that regional difference was highly significant for all six measures of SMEs' access to financial services. The size of the firm (i.e. number of fulltime employee) was also a significant factor for all but applied for a loan. Except for gender of the top manager, all other predictors were significant for one or more dependent variables at least 90% confidence level.

Test of model effect (Table 7.4) is particularly important for the categorical predictors to detect their overall significance level[13]. For instance, regions were highly significant for explaining all the dependant variables. The question of how and which regions were significantly different than others, will depend on the choice of the reference categories which are presented in the table of parameter estimations (Table 7.5 & 7.6).

[12] To test the hypotheses about the parameters' significance, H_0: $\beta = 0$, Wald test statistic $Z = \hat{\beta} / SE$. Here, SE is the standard error of estimated $\hat{\beta}$ *and* Z^2 has an approximate *chi-squared* distribution.

[13] While, the *Wald chi-square* (significance test) values for continuous variables are same in both tables (model effect and parameter estimations). For the categorical variables, the Waldχ^2 columns in the table of model effect shows the overall significance of the group; and in the table of parameter estimations, it shows the relative significance with their respective reference category.

Table 7.4: Test of model effect (GLMs regressions)

Dep. Variable →	bank account		Overdraft		Loan/Line of credit		Applied for new loan		% of WC funded by Banks		% of FA funded by Banks	
Parameter ↓	Waldχ^2	Sig.	Waldχ^2	Sig.	Waldχ^2	Sig.	Waldχ^2	Sig.	Waldχ^2	Sig.	Wald χ^2	Sig.
(Intercept)	2.02	0.15	31.01	***0.00	4.57	**0.03	1.59	0.20	104.74	***0.00	6.50	***0.01
Region	221.36	***0.00	65.56	***0.00	34.17	***0.00	44.51	***0.00	63.04	***0.00	13.30	**0.03
Sector	17.43	***0.01	7.38	0.39	5.76	0.56	8.63	0.28	13.57	**0.05	15.04	**0.03
Legal status	17.14	***0.00	24.47	***0.00	3.08	0.21	4.26	0.11	1.63	0.44	5.55	*0.06
Subsidiary	0.34	0.55	9.67	***0.00	0.80	0.37	0.36	0.54	0.02	0.89	1.76	0.18
Age since started	6.25	***0.01	0.56	0.45	0.11	0.73	0.03	0.86	3.49	*0.06	1.67	0.19
Size (employee)	11.94	***0.00	15.11	***0.00	6.18	***0.01	0.11	0.74	4.14	**0.04	0.66	0.41
Exports	0.12	0.73	4.59	**0.03	0.15	0.70	8.55	***0.00	2.47	0.11	2.56	*0.10
Imports	0.06	0.80	1.98	0.16	1.50	0.22	2.58	*0.10	0.47	0.49	0.98	0.32
Sales	3.56	**0.05	11.35	***0.00	0.06	0.80	0.26	0.61	2.92	*0.08	0.99	0.32
Gross margin	20.18	***0.00	1.00	0.31	5.72	***0.01	0.18	0.67	0.04	0.83	10.09	***0.00
Gender	0.71	0.39	0.12	0.72	0.73	0.39	0.00	0.95	1.63	0.20	2.90	*0.08
Education level	5.06	**0.02	5.00	**0.02	3.87	**0.04	0.01	0.94	0.00	0.96	0.25	0.61
Experience	1.19	0.27	2.64	*0.10	1.53	0.21	2.26	0.13	0.04	0.84	6.98	***0.00
Bank account					0.13	0.71	1.55	0.21	14.53	***0.00	1.74	0.18
Overdraft facility					200.54	***0.00	94.71	***0.00	10.13	***0.00	3.61	**0.05
WC_internal									586.50	***0.00		
FA_internal											220.436	***0.00

Note: levels of significant are denoted *as *** = ($\alpha \leq 1\%$), ** = ($\alpha \leq 5\%$), * = ($\alpha \leq 10\%$).*
Source: Calculation based on the 2015 WBES survey in Turkey.

Table 7.5: Parameter estimation (Binary Logistic Model)

Dep. Variable →	Saving/Cheking account			Overdraft facility			Loan/Line of credit			Applied for new loan		
Ind. Variable ↓	B	Exp(B)	Sig.	B	Exp(B)	Sig.	B	Exp(B)	Sig.	B	Exp(B)	Sig.
(Intercept)	1.06	2.88	0.22	-4.69	0.01	***0.00	-3.25	0.04	***0.00	-2.35	0.10	***0.01
[Southeast Anatolia]	-4.23	0.02	***0.00	-1.31	0.27	***0.00	0.28	1.32	0.28	0.02	1.02	0.94
[East Anatolia]	-4.74	0.01	***0.00	-1.33	0.26	***0.00	0.36	1.43	0.22	-0.62	0.54	*0.08
[Central Anatolia]	-3.85	0.02	***0.00	-0.68	0.51	***0.01	-0.08	0.93	0.80	0.15	1.16	0.62
[Aegean Region]	-2.78	0.06	***0.00	-0.27	0.77	0.26	1.20	3.32	***0.00	1.14	3.11	***0.00
[Marmara]	-3.15	0.04	***0.00	-0.26	0.77	0.27	0.45	1.58	*0.08	0.07	1.07	0.80
[Black Sea]	-2.40	0.09	***0.00	-0.66	0.52	***0.00	0.47	1.60	*0.08	0.38	1.46	0.16
[Region: Istanbul]	0a			0a		.	0a		.	0a		.
[Tourism & other services]	-0.17	0.84	0.54	0.40	1.49	0.15	-0.31	0.73	0.31	-0.36	0.70	0.30
[Transport Services]	1.48	4.40	**0.02	0.85	2.34	0.11	0.11	1.12	0.86	-0.26	0.77	0.71
[Wholesale and retail]	0.25	1.28	0.40	0.29	1.34	0.31	0.03	1.03	0.92	0.17	1.19	0.59
[Construction services]	0.27	1.31	0.34	0.44	1.55	0.13	-0.33	0.72	0.30	-0.43	0.65	0.26
[Other manufacturing]	0.50	1.66	***0.00	0.40	1.48	**0.03	-0.06	0.94	0.75	0.06	1.06	0.77
[Metal, machinery, motor]	0.46	1.59	***0.01	0.27	1.30	0.13	-0.06	0.95	0.76	-0.21	0.81	0.31
[Textiles and garments]	0.42	1.53	***0.01	0.27	1.31	0.12	-0.37	0.69	**0.05	-0.42	0.66	**0.04
[Sector: Food products]	0a		.	0a		.	0a		.	0a		.
[Corporation]	0.65	1.91	***0.00	0.73	2.07	***0.00	0.07	1.07	0.67	0.03	1.03	0.86
[Partnership]	0.39	1.47	0.20	0.37	1.45	0.21	-0.52	0.59	0.11	-0.81	0.44	**0.04
[LS: Sole proprietorship]	0a		.	0a		.	0a		.	0a		.
[Subsidiary=1]	0.25	1.29	0.55	-1.35	0.26	***0.00	-0.41	0.67	0.37	-0.29	0.75	0.54
[Subsidiary=0]	0a		.	0a		.	0a		.	0a		.
[Exports=1]	-0.07	0.93	0.73	0.44	1.55	**0.03	-0.08	0.92	0.70	0.64	1.89	***0.00
[Exports=0]	0a		.	0a		.	0a		.	0a		.

Table 7.5 Continues

[Imports=1]	-0.07	0.93	0.80	-0.40	0.67	0.16	0.37	1.45	0.22	0.49	1.63	**0.10
[Imports=0]	0a		.	0a		.	0a		.	0a		.
[Female manager=1]	-0.18	0.83	0.39	0.08	1.08	0.72	0.20	1.22	0.39	0.02	1.02	0.95
[Male manager=0]	0a		.	0a		.	0a		.	0a		.
Ln (age)	-0.19	0.83	***0.01	-0.06	0.95	0.45	-0.03	0.97	0.73	-0.01	0.99	0.86
Ln (size/employee)	0.26	1.30	***0.00	0.29	1.34	***0.00	0.21	1.23	***0.01	0.03	1.03	0.74
Ln (sales)	0.11	1.12	**0.05	0.22	1.24	***0.00	-0.02	0.98	0.80	-0.04	0.96	0.61
Gross margin	-1.02	0.36	***0.00	-0.19	0.83	0.31	0.59	1.81	***0.01	-0.09	0.91	0.67
Education level	0.23	1.25	**0.02	0.22	1.25	**0.02	0.21	1.23	**0.04	-0.01	0.99	0.94
Ln (experience)	0.12	1.12	0.27	0.17	1.19	*0.10	0.14	1.15	0.21	0.19	1.20	0.13
[Bank account=1]							-0.06	0.95	0.71	0.21	1.23	0.21
[Bank account=0]							0a		.	0a		.
[Overdraft facility=1]							2.08	8.03	***0.00	1.54	4.65	***0.00
[Overdraft facility=0]							0a		.	0a		.
(Scale)	1b			1b			1b			1b		

Note: levels of significant are denoted *as *** = (α ≤ 1%), ** = (α ≤ 5%), * = (α ≤ 10%).*

a. These indicators were treated as reference category, so their parameter were set to zero

b. scale parameter were fixed at 1.

Source: The regression calculations in this table (also the next table 7.6) are based on the 2015 WBES survey in Turkey.

Table 7.6: Parameter estimation (Negative Binomial Model)

Dep. Variable ▸	% of W.C. funde by banks			% of F.A. funded by banks		
Parameter ▾	B	Exp(B)	Sig.	B	Exp(B)	Sig.
(Intercept)	8.46	4733.11	***0.00	3.74	42.07	0.132
[Southeast Anatolia]	0.59	1.81	***0.01	3.88	48.32	***0.00
[East Anatolia]	-0.16	0.85	0.58	3.78	43.85	***0.00
[Central Anatolia]	0.67	1.95	**0.03	2.80	16.48	**0.02
[Aegean Region]	1.22	3.40	***0.00	4.03	56.12	***0.00
[Marmara]	0.55	1.73	**0.03	3.57	35.63	***0.00
[Black Sea]	1.58	4.86	***0.00	3.66	38.67	***0.00
[Region: Istanbul]	0a	1	.	0a	1	.
[Tourism & other services]	0.40	1.49	0.19	1.41	4.11	*0.07
[Transport Services]	-0.06	0.94	0.91	-3.32	0.04	**0.05
[Wholesale and retail]	0.52	1.69	*0.09	1.45	4.25	0.11
[Construction services]	0.50	1.66	0.11	0.91	2.48	0.14
[Other manufacturing]	0.38	1.47	**0.05	1.12	3.05	***0.01
[Metal, machinery, motor]	0.09	1.10	0.63	0.28	1.32	0.52
[Textiles and garments]	-0.18	0.84	0.36	0.18	1.19	0.68
[Sector: Food products]	0a	1	.	0a	1	.
[Corporation]	0.21	1.24	0.20	-0.75	0.47	*0.06
[Partnership]	0.10	1.11	0.77	-1.39	0.25	**0.04
[LS: Sole proprietorship]	0a	1	.	0a	1	.
[Subsidiary=1]	0.06	1.06	0.89	1.16	3.20	0.18
[Subsidiary=0]	0a	1	.	0a	1	.
[Exports=1]	0.34	1.41	0.11	0.65	1.92	*0.10
[Exports=0]	0a	1	.	0a	1	.
[Imports=1]	-0.21	0.81	0.49	-0.71	0.49	0.32
[Imports=0]	0a	1	.	0a	1	.
[Female manager=1]	-0.32	0.73	0.20	-1.23	0.29	*0.08
[Male manager=0]	0a	1	.	0a	1	.
Ln (age)	0.15	1.17	*0.06	0.22	1.24	0.19
Ln (size/employee)	0.17	1.19	**0.04	0.16	1.18	0.41
Ln (sales)	-0.11	0.90	*0.08	0.17	1.19	0.32
Gross margin	0.05	1.05	0.83	-1.87	0.16	***0.00
Education level	0.01	1.01	0.96	0.11	1.12	0.61
Ln (experience)	-0.02	0.98	0.84	-0.87	0.42	***0.00
[Bank account=1]	0.57	1.76	***0.00	-0.46	0.63	0.18
[Bank account=0]	0a	1	.	0a	1	.
[Overdraft facility=1]	0.47	1.60	***0.00	0.57	1.77	**0.05
[Overdraft facility=0]	0a	1	.	0a	1	.
WC_internal	-0.10	0.90	***0.00			
FA_internal				-0.10	0.91	***0.00
(Scale)	.85b			.48b		
D (Negative binomial)	4.97			5.46		

***Note*:** levels of significant are denoted as *** = ($\alpha \leq 1\%$), ** = ($\alpha \leq 5\%$), * = ($\alpha \leq 10\%$).
a. These indicators were treated as reference category, so their parameter were set to zero
b. Computed based on the Pearson chi-square.

7.2.2 Parameter Estimation

The table of parameter estimation (Table 7.5 & 7.6) presents all the explanatory variables along with their estimated coefficients (betas). In the logistic regressions, the log of odds (logit) = [ln(π/(1-π))] were linearly linked with the predictor variables. Therefore, their antilog "exp(B)" parameter will have a multiplicative marginal effect on the odds of success of the response variables. However, for the continuous predictors, for which the logarithmic form was used in the model, estimated coefficients (B) directly explain their proportional effect on the dependent variables.

The SPSS software provides similar output and test statistics for all GLMs regressions, as it applies a common algorithm (Newton–Raphson algorithm) for finding ML estimation of parameters. But the statistical inferences and interpretations would vary according to the underlying link function. The link of the logistic model is the natural log of the odds ratio, so the marginal effect of each explanatory variable would be translated in terms of odds (probability). In the negative binomial model; the log-linear link was applied, where the mean of the dependent variable is linearly related to the explanatory variables. So their coefficients would explain the marginal effects on the variation of the expected values E (Yi|xi), while holding other independent variables fixed at their mean.

7.2.3 Statistical Inferences and Interpretations

7.2.3.1 Binary Logistic Regressions (Table 7.5)

Among the multi-category variables, Istanbul was the reference category for regions; similarly, food sector was the reference for the sector category, and sole proprietorship for the legal status category. So, these references (indicator) will be compared against their respective groups.

All the regional coefficients were negative for bank account and overdraft facility, meaning that compared to Istanbul, all other regions were less likely to have a bank account and overdraft facility. The odds of having a bank account are the lowest for East and Southeast Anatolia regions. Where, Exp(B) = 0.01 and 0.02 implies that SMEs in these two regions have odds of having a bank account respectively 99% and 98% less than that of Istanbul. Meanwhile, Marmara, Black Sea, and Aegean regions are more likely to have a loan/line of credit compared to Istanbul region. SMEs in the Aegean region were also more likely to have applied for a loan/line of credit.

Manufacturing sectors (textile and garments; metal, machinery, motor, transport) were more likely to have bank account compared to the food sector. Other manufacturing industries (included manufacturer of beverage, tobacco, paper & printing, leather, and chemical products) have a significantly higher probability of having an overdraft facility. As we can see, each sector consisted of several other industries, so it is hard to compare between the groups.

Looking at the legal status (ownership) category, it seemed that the odds of having a bank account and overdraft facility were about two times higher for corporations than that of sole proprietorships.

For the binary predictors, the responses of "Yes" (x =1) category was compared against "No" (x = 0). Among the binary independent variables, exporting firms (exports directly and/or indirectly) are more likely to have an overdraft facility and applied for new loan/line of credit than the non-exporting ones. More precisely, the odds were 1.55 times (55%) and 1.89 times (89%) higher for exporting firms than non-exporting ones. Interestingly subsidiary firms (part of a larger firm) were significantly less likely to have an overdraft facility. Perhaps, subsidiary firms have access to alternative financing source from their parent/holding corporations; so if

needed, they can use up the parents' company's overdraft facilities We also found that SMEs, who had an overdraft facility, had 8 times higher odds of having a line of credit and 4.65 times more likely to apply for a new loan.

All four continuous predictors (age, size, sales, and gross margin) were statistically significant for having a bank account. Among them, older firms and higher gross margin were less likely to have a bank account, in contrast, bigger size and higher sales were positively related with having a bank account, overdraft facility, and line of credit. The size of the firm has such a strong impact that ceteris paribus 1% increases in full-time employee increases the odds by about 26% for having a bank account, 29% for having an overdraft facility and 21% for having loan/line of credits from a bank.

Owner/manager's highest level of education was the only attribute of the top manager that was found significant and positively associated with having a bank account, overdraft facility and line of credit. It was an ordered category of 5 levels from primary to post graduate. In the model, it was used as a numeric predictor, so its coefficient "exp. (B)" will represent the marginal impact of education on the dependent variables. In this regard, an additional level of manager/owner's education would raise the odds of using banks' financial services about 25%.

7.2.3.2 Negative Binomial Regressions (Table 7.6)

The regional differences in financing fixed assets were found to be far more intense. Firms in the Aegean region had the highest expected value for funding fixed assets by bank loans, which is 56.12 times higher than Istanbul area. Notably, East and Southeast Anatolian regions were also borrowing far more proportion of fixed assets (43.85 and 48.32 times respectively) than Istanbul. Whereas, regarding the usage of other form bank services (e.g. saving/checking account and overdraft

facilities), firms in these regions were found to be using significantly less than the ones in the Istanbul region. This means that, SMEs in Southeast and Anatolian regions were mostly reliant on banks for their long-term investments; perhaps, they lack either equity capital or alternative source of funds. From supply viewpoint, it could also mean, banks in those regions prefer to finance (fixed-asset-backed) investment which is less risky than lending working capital or cash-flow based projects.

Regarding sector or industry differences, we compared food products manufacturer against the other sectors. Other manufacturing sectors (included manufacturer of beverage, tobacco, paper & printing, leather, and chemical products) borrowed on average, about 1.5 times more for funding working capital and 3 times more for fixed assets. Firms in the transport services, were expected to borrow 96% (1 - 0.04) less proportion of fixed assets from banks.

The differences of the firm's legal status were not statistically significant for explaining the proportion of working capital borrowed from banks. However, for the fixed assets financing by banks, it was significant for the partnerships (at alpha 5%) and for the corporations (at 6%). Which means that compared to the sole proprietorship, both partnership and corporations were expected to borrow less by 75% and about 50% respectively for fixed asset financing,. One sensible explanation could be the fact, that corporation and partnership firms have more alternative resources (e.g. bonds, equity, venture capital etc.); while, sole proprietorships are heavily relying on banks when they need for external finance for fixed assets.

Age and size of the firm were found to be significant and positively associated with the borrowing of working capital. Meaning that, older and larger firms were expected to borrow more for their working capital financing which is consistent with

the conventional expectation. Statistically speaking, a 1% increase in age, and size, increased the likelihood of short-term borrowing by 15% and 17% respectively.

Among the business operational factors; gross margin ratio was highly significant and negatively associated with the mean proportion of fixed assets financed by banks. A 1% increase (decrease) in gross margin would decrease (increase) the average proportion of fixed asset financing by 0.16 times or 84%. Similarly, sales revenue was also found to be significant and negatively associated with the short-term loan (i.e. borrowing for working capital). In other words, higher sales revenue associated with less borrowing for working capital and higher profit (gross margin) associated with less debt financing for fixed assets. It confirms the pecking order prediction that more profitable firms will use less debt financing as they generate sufficient internal funds (retained earnings). Exporting and importing activities were positively associated with both short and long-term loan. However, these factors were not statistically significant at 10 % cut off alpha level, although exporting was very close at 11% significant level.

Among the managerial competency factors, experience and female manager were found to be significant and negatively associated with fixed asset financing by bank loans. However, education and subsidiary were not found to be statistically significant determinants for the usage of bank loans.

In the negative binomial regressions, there were also two dummies for “bank account” and “overdraft”, used as control variables. Having overdraft facility was significant for both working capital and fixed asset funding by banks. The average borrowings of working capital was 60% more for the SMEs, who had overdraft facility than who did not, and it was 77% more for the proportion of fixed assets.

Likewise, having a saving/checking account also increased the average of the working capital borrowings by 76%.

7.2.4 Model Adequacy and Robustness

7.2.4.1 Binary Logistic Model

SPSS software generates GLMs regression outputs, featuring various model fit and diagnostic test statistics. Table 7.7, Table 7.8, and Table 7.9 illustrate the results of these test statistics for binary logistic regression.

Values of "N" in the table "Test of model fit" (Table 7.7) showed the number of valid cases (sample SMEs) processed in each regression. It also presented some popular (chi-square) test results for model significance and adequacy. Those are discussed as below:

Table 7.7: Test of model fit (Binary Logistic Model)

Dep. Variable ▾	Statistics	Value	DF	Value/DF	Significance
Saving /Checking Account	N	1712			
	Likelihood Ratio	556.09	25		P < 0.01***
	Deviance (G^2)	1817	1686	1.078	P > 0.10
	Pearson (χ^2)	1713	1686	1.016	P > 0.20
	Hosmer-Lemeshow	14.981	8		P = 0.10
Overdraft facility	N	1701			
	Likelihood Ratio	349.51	25		P < 0.01***
	Deviance (G^2)	1822.8	1675	1.088	P > 0.10
	Pearson (χ^2)	1733.1	1675	1.035	P > 0.20
	Hosmer-Lemeshow	1.631	8		P = 0.99
Have bank loan	N	1689			
	Likelihood Ratio	448.56	27		P < 0.01***
	Deviance (G^2)	1622.2	1661	0.977	P > 0.20
	Pearson (χ^2)	1680.8	1661	1.012	P > 0.20
	Hosmer-Lemeshow	8.621	8		P = 0.38
Applied for new Loan	N	1677			
	Likelihood Ratio	280.24	27		P < 0.01***
	Deviance (G^2)	1416.2	1649	0.859	P > 0.20
	Pearson (χ^2)	1661	1649	1.007	P > 0.20
	Hosmer-Lemeshow	11.29	8		P = 0.20

Likelihood ratio: also known as the omnibus test, which compares the fitted model with the intercept-only model, the test hypothesis is:

H_0: reduced model (intercept only) is true vs. H_a: the current model is true

The test statistic is: $\chi^2 = -2\ ln(l_0/l_1) = -2[ln(l_0)-ln(l_1)] = -2[L_0 - L_1]$

Where, L_0 = *log likelihood* of the reduced model and L_1 = *log likelihood* of the model of interest with *K* degrees of freedom (*K* equals the number of coefficients in the model).

All the binary regressions were found to be significantly better than the reduced models with highest precisions (*** = $\alpha_{1\%}$).

Deviance (G^2): The deviance of a model is based on the difference between the log-likelihood of the model of interest (M), and that of the most complex model also known as saturated model (S). It is a test statistic for the hypothesis that all the parameters in the saturated model S, but not in model M equal zero.

H_0: The proposed model fits as good as the saturated model

Ha: null hypothesis is not correct meaning proposed model lacks fit

Deviance (G^2) = $-2[L_M - L_S]$

By rejecting the null hypothesis (i.e. large test statistic or smaller *p <5%)* provides evidence for lack of fit.

Pearson residual: The Pearson residuals are the standardized difference between the estimated and observed values of the dependent variable.

$$Pearson\ residual = \hat{e}_i = \frac{\hat{y}_i - \hat{\mu}_i}{\sqrt{var(\hat{\mu}_i)}}$$

$$Pearson\ (\chi^2) = \sum \hat{e}_i^2 = \sum \frac{(\hat{y}_i - \hat{\mu}_i)^2}{var(\hat{\mu})}$$

[*Binomial distribution has $\mu = n\pi$; and variance = $n\pi(1-\pi)$]*

Both *Deviance* (G^2) and *Pearson* χ^2 were compared to a chi-square distribution table[14] with the residual $df = N\text{-}K$ (number of observation minus number of model parameters). None of the test statistics could reject the null hypothesis, which provide evidence that the binary regression models were adequate.

Hosmer-Lemeshow test for overall goodness of fit: For a binary model with multiple factors and/or continuous predictors, the G^2 and X^2 might not be the most reliable for assessing the overall fit. An alternative statistic for measuring overall goodness-of-fit is the Hosmer-Lemeshow test[15]. This is a Pearson-like $\chi 2$ that partitions the observations in groups according to the model-predicted probabilities ($\hat{\pi_i}$). Each group has an observed count of subjects with each outcome and a fitted value for each outcome. SPSS software utilized 10 groups of equal size ($N/10$), with the *degree of freedom* $= 10\text{-}2 = 8$. (Agresti, 2007, p. 147).

As with *Deviance* (G^2) and *Pearson* (χ^2), low test values and high *P-values* for the Hosmer-Lemeshow test also provides significant evidence that the binary regressions fitted well to the data.

The "classification table" (Table 7.8) summarizes predictive power of the binary regressions. The predictions were computed as $\hat{y} = 1$ when $\hat{\pi_i} > \pi_0$ and $\hat{y} = 0$ when $\hat{\pi_i} \leq \pi_0$. SPSS calculations considered the arbitrary cut-off value for $\pi_0 = 0.50$. This means that a particular case was classified into the "Yes" category if the probability of success $P(\hat{y}=1|x)$ was greater than 0.50. Otherwise, it was classified as "No" category. Three useful summaries of predictive power are:

Sensitivity = $\boldsymbol{P(\hat{y}=1|y=1)}$**:** the percentage of cases that were correctly classified as "Yes" category, given that the observed cases were also "Yes" category.

[14] Since chi-square distribution table were available for *df = 1000 at the most*, we linearly extrapolated critical values ($\chi^2_{N\text{-}K}$) to reject null hypotheses at least 90% confidence level.
[15] https://onlinecourses.science.psu.edu/stat504/node/164.

Specificity = *P(ŷ=0|y=0):* percentage of cases predicted as "No" category that were also matched with observed "No" category.

Overall percentage = *P(correct classification)*: proportion of correct classifications that is the weighted average of sensitivity and specificity. For all measures, the higher the proportion of correct classification, the better the model's predictive power. (Agresti, 2007, p. 23).

Table 7.8: Classification table (Binary Logistic Model)

Observed		Predicted			
		Bank Account			
		No	Yes	Total	Correct %
Saving /Checking	No	658	209	867	75.90
account	Yes	254	591	845	69.90
	Overall %				73.00
		Overdraft Facility			
		No	Yes	Total	Correct %
Overdraft Facility	No	1004	125	1129	88.90
	Yes	321	251	572	43.90
	Overall %				73.80
		Have a Bank Loan			
		No	Yes	Total	Correct %
Have a Bank Loan	No	1022	156	1178	86.80
	Yes	214	297	511	58.10
	Overall %				78.10
		Applied for Loan			
		No	Yes	Total	Correct %
Applied for Loan	No	1285	50	1335	96.30
	Yes	251	91	342	26.60
	Overall %				82.10

In the classification table (Table 7.8), all the binary responses were correctly predicted well above 70% of the cases overall, which is considered to be a good fit for the data. However, the results were very sensitive to the relative frequency of observed y. The limitation of predictability for unbalanced binary response was reflected in the classification table, where the dependent variable was whether

"SMEs have applied for new loan". In this model, the sensitivity was about 27% whereas the specificity for the same regression was 96%. These outcomes were influenced by the unbalanced observed frequency of this response variable. Where, the observed "Yes" category was 20% = *(342/1677)*100*, whereas, the "No" category was about 80% ≈ *(1335/1677)*100*.

Table 7.9: Model summaries (Binary Logistic Model)

`Model/ Dep. Variable	-2 Log likelihood	Pseudo R-squared	
		Cox & Snell	Nagelkerke
Bank Account	1816.96	28%	37%
Overdraft Facility	1822.78	20%	26%
Have Bank Loan	1622.17	23%	33%
Applied for Loan	1416.25	20%	24%

Binary logistic regression outputs also provide a model summary table (Table 7.9), showing "Cox & Snell" and "Negelkerke" R-squared values. These are also referred as pseudo R^2, which measure the explained variation of the probability of success or failure for the dependent variable. Pseudo R^2 is equivalent to the OLS R^2 but interpreted with more caution and will have lower values than OLS[16]. While the "Cox & Snell" R^2 is more conservative, that cannot achieve a value of 1. So, it is preferable to report the "Nagelkerke" R^2 value which is a modification of "Cox & Snell" R^2. In this regard, we can say that our binary model could explain about 24% to 37% variance of probability of using these financial services by SMEs in Turkey.

[16]https://statistics.laerd.com/spss-tutorials/binomial-logistic-regression-using-spss-statistics.php

7.2.4.2 Negative Binomial Model

From the test statistics of the model fit table (Table 7.10) we can see that the Likelihood Ratio chi-square test statistics were significant for both models. It provides evidence that the model's parameters collectively different than zero. With Deviance (G^2) and Pearson (χ^2) test, we compared the model against a more complex saturated model. So, rejecting null hypotheses would provide evidence for lack of fit. In our model, we could not reject the null hypothesis; meaning, both of the regressions are as good as the saturated model.

Table 7.10: Test of model fit (Negative Binomial Model)

Dep. Variable ▸	% of W.C. funded by Banks				% of F.A. funded by Banks			
Test Statistics ▾	Value	DF	Value/DF	Sig.	Value	DF	Value/DF	Sig.
N	1601				325			
Likelihood Ratio	831.46	28		*0.0	343.17	28		*0.0
Deviance (G^2)	931.40	1571	0.59	0.99	159.24	295	0.54	0.99
Scaled Deviance	1083.66	1571			326.98	295		
Pearson (χ^2)	1350.30	1571	0.86	0.99	143.66	295	0.49	0.99
Scaled Pearson	1571.00	1571			295.00	295		

However, with continuous predictors, Deviance (G^2) and Pearson (χ^2) do not have approximate chi-square distribution. But slightly modified measure, i.e. Pearson (χ^2/df), gives the most reliable measure of goodness-of-fit for the GLMs regression with continuous predictors (Agresti 2007, pp. 145-147). It measures the accuracy of error variance (dispersions) predicted by the model. Asymptotically large sample chi-square distribution converges to the value of its degree of freedom (df). The test value of (χ^2/df) $\approx$ 1, a rule of thumb ($0.90 \leq (\chi^2/df) \leq 1.1$), meaning that predicted variance is similar to observed variance. Hence, indicating a good fit for the model

and said to have equidispersion[17]. If it exceeds 1 then the model suffers overdispersion problem, and a value below 1 indicates underdispersion.

For the regression of working capital, Pearson goodness-of-fit (χ^2/df) = 0.86, meaning the model was a good fit as the test statistic (χ^2/df) was close to 1. However, for the model of fixed assets, it was 0.49 which is far below 1. As this model has a relatively small residual degree of freedom (df=295) it is still considered to be a good fit. Nevertheless, inorder to adjust for the overdispersion (underdispersion) problem, the estimated parameters were scaled with Pearson (χ^2)/df value (see the scale parameter in Table 7.5) in the negative binomial model. It does not affect the estimation of the model's parameters but modifies the standard error of the estimated parameters.

[17] In the binary model all the test statistic of (χ^2/df) was close to 1, which further proves the goodness of fit for the binary logistic regressions (see "Value/DF" column in table 14).

Chapter 8

CONCLUDING REMARKS

This thesis provides a complete insight to the state of SMEs' access to financial services and bank credit in Turkey. Based on both theoretical expectation and empirical evidence; some important macroeconomic and firm-specific factors were identified, which affect the supply of and the demand for bank loans to SMEs. The conceptual framework and hypothetical association of these identified factors were explained in the lights of relevant literature, theories, and existing studies. At the same time, descriptive statistics and regression analyses provided significant statistical evidence and the extent of association.

The OLS regression analysis confirmed the conceptual hypothesis that, Turkish commercial banks' lending to the SME sector is led by the economic growth and stability (i.e. higher GDP growth & low inflation), as well as the higher competition in the banking sector (i.e. lower bank concentration). While, the extent of government borrowing reduces the supply of loanable funds to the SME sector. This finding provides a better understanding of the macroeconomic and financial environment conducive for commercial bank lending to SMEs.

Therefore, it can be suggested that the government could promote the growth of SME loans through the macroeconomic policies. For instance, the government can control the public sector debt by avoiding heavy domestic borrowings and inflationary ways of financing budget deficit, which are major obstacles for the growth of SME loans. Governments should also take the initiatives to increase or

ensure the competitive environment of the banking and financial system, as it increases the competition within the banking sector. In the face of competition, banks are forced to reach out to SMEs in order to sustain their (banks) business and profitability.

Using firm-level data from a series of WBES surveys, over the period from 2002 to 2015, this research sheds light on the demand side of SME finance with empirical evidence from as many as 6000 enterprises in Turkey. In the GLMs regression analyses, SMEs' access to finance was approximated by their usage of bank services (saving/checking account, line of credit and overdraft facilities) as well as the use of short term and long term loans (i.e. proportion of working capital and fixed assets financed by bank loan). In the process, binary logistic regression was carried out to explain the use of bank services while the negative binomial regression for explaining the use of short and long-term loans.

All the firm-specific variables were classified into three categories; firms' demographic, operating performance, and managerial competency factors. The empirical analyses revealed regional differences in the usage of banks' services and loans. SMEs in the relatively less developed region were less likely to use bank services yet largely reliant on bank loans for financing their fixed assets. A similar pattern was found for the sole proprietorship firms as compared to corporations and partnerships. Owner/manager's experience was also significant and negatively related with the proportion of fixed assets financed by the bank; while, it was positively related with the use of overdraft (at 10% significant level). This pattern of using less of bank services and working capital loans but more of fixed asset financing indicates that those SMEs are largely reliant on banks for their fixed assets financing.

Theoretically, these features (rural region, sole proprietor, & less experienced manager) of SMEs are associated with higher information asymmetry and less competent management practice; hence, they are more likely to be financially constrained. On the supply side constraint, possibly lack of bank/brunch in those identified region/sub-regions may explain lesser usage of financial services. Also with the absence or lack of competition, banks may behave monopolistic where they ration credit, mostly to tangible assets or mortgaged lending rather than cash flow/earning backed loans; such as overdraft, line of credit, and/or working capital financing. Moreover, monopolistic practice led banks to overlook smaller firms; instead, they engage with larger corporations or selected firms.

It was also found that more profitable SMEs (measured as sales revenue and gross margin) used less debt for their working capital and fixed asset financing which is consistent with the traditional pecking order theory of financing decision. The level of education was found to be the most important determinant among the owner/manager's personal quality measure. All of the identified determinants were statistically significant for predicting at least one or more measure of access to financial services and credit.

Findings of the firm-level analyses underline the importance of developing regional policies to improve SMEs utilization of financial services in Turkey. Since using non-credit bank services (saving/checking account) open up the possibility of access to credit, it should be prioritized to bring the unbanked SMEs (rural/remote regions) into an inclusive financial system.

The level of education and utilization of financial products were found to be significant and positively correlated. In the empirical research, managers' level of education, experience, and knowledge of financial system commonly used to

approximate financial literacy. Hence, it is safe to say that SMEs in the less developed/rural regions (where the usage of financial services were too low), may lack financial literacy. Therefore, improving financial literacy of SMEs' owners in those regions through the business associations will help businesses to have better access to finance.

From the supply perspective, it is also likely that, those regions may lack financial infrastructure to provide proper access to financial services. So, the findings may provide incentives for banks to increase their branch networking and physical outreach to those less developed regions. Banks may upgrade or restructure their traditional practice (i.e. establishing Fintech/digital platform) to provide remotely accessible financial services.

In this research I also found evidence that even though SMEs have better access to finance, they are not seeking external financing as much in recent years. This raises a further concern of growth and productivity of the SMEs in Turkey. World Bank (2011b) stressed that "Turkish SMEs grow slower than both large enterprises in Turkey and SMEs in comparator countries. Not only are SMEs in Turkey less productive than larger firms, but the gap across firm size is larger in Turkey than in other countries" (p.8). Therefore, in line with World Bank (2011b), this finding also recommend promoting policies not only focusing the access dimension but also helping them to grow bigger as opposed to policies that make it attractive to remain an SME.

Although my empirical analysis investigated the Turkish economy, the explained theories, empirical findings and their implication can be inferred to other emerging markets countries as well. In our recently published paper, Jenkins and Hossain (2017) we also showed that our findings of macroeconomic (supply side) analysis in

Turkey, were also consistent with five other emerging markets countries; namely Argentina, Brazil, Chile, Mexico, and Poland. We also expect that our findings of the firm level analysis may reflect in other emerging market and developing countries as well, which might be a further research potential.

Finally, it must be stressed that the firm-level analyses are subject to two major pitfalls. 1) Although WBES is the largest and most widely used firm-level database; by far, it covers only the formally registered firms excluding informal sector. This is a major drawback of using WBES data; especially, for the reason that the informal SMEs are the ones who are more prone to financing obstacles. 2) The quantitative analyses mainly based on the actual usage of the financial services by SMEs. This dimension of measuring access to financial services does not consider the availability and possibility of access to these services for those firms who did not use these services either voluntarily (non-users) or involuntarily (potential users).

REFERENCES

Agresti, A. (2007). *An Introduction to Categorical Data Analysis* (2nd ed.). Hoboken, New Jersey: John Wiley & Sons.

Akyüz, Y. (1990). *Financial System and Policies in Turkey in the 1980s*, in: Arıcanlı, T. and Rodrik, D. (eds), The Political Economy of Turkey. St Martin's Press, New York.

Akyüz, Y., & Boratav, K. (2003), The Making of the Turkish Financial Crisis. *World Development*, 31 (9), 1549-1566.

Arora, R.U. (2014). Access to finance: An Empirical Analysis. *European Journal of Development Research*, 26 (5), 798-814. doi:10.1057/ejdr.2013.50.

Aterido. R., Beck. T., & Iacovone, L. (2013). Access to finance in Sub-Saharan Africa: Is There a Gender Gap?" *World Development*, 47, 102–120.

Ayyagari, M., Demirguc-Kunt, A., and Maksimovic, V. (2011). *Small vs. Young Firms across the World. Contribution to Employment, Job Creation, and Growth*. (Policy Research Working Paper No. 5631). Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/3397/WPS5631.pdf?sequence.

Beck, T., & De la Torre, A. (2007). The Basic Analytics of Access to Financial Service. *Financial Markets, Institution and Instruments*, 16(2), 79-117. Retrieved from https://pure.uvt.nl/portal/files/1023754/The_Basic_Analytics_of_Access_to_Financial_Services.pdf.

Beck, T., Behr, P., & Madestam, A. (2011). *Sex and credit: Is there a gender bias in microfinance?* (European Banking Center Discussion Paper. 2011-2027). Tilburg University, the Netherlands.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing Patterns around the World: Are Small Firms Different? *Journal of Financial Economics*, 89(3), 467-487. doi: 10.1016/j.jfineco.2007.10.005.

Beck, T., Demirguc-Kunt, A., & Martinez Peria, M. S. (2009). *Bank Financing for SMEs: Evidence Across Countries and Bank-ownership Types.* European Banking Center Discussion Paper 2009-20.

Beck, T, Demirguc-Kunt, A., Laeven, L., and Maksimovic, V. (2006). The determinants of financing obstacles. *Journal of International Money and Finance*, 25, 932-952.

Berg, G. & Fuchs, M. (2013). *Bank Financing of SMEs in Five Sub-Saharan African Countries: The Role of Competition, Innovation, and the Government.* (World Bank Policy Research Working Paper No. 6563). Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/15994/WPS6563.pdf.

Berger, A.N. and Udell. G.F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking and Finance*, 30 (11), 2945-2966.

BIS (2012). SME access to External Finance: (BIS Economics Paper No. 16). Retrieved from http://www.bis.gov.uk/files/file53949.doc.

Bougheas, S., Mizen, P. and Yalcin, Y. (2005). Access to External Finance: Theory and Evidence on the Impact of Monetary Policy and Firm-Specific Characteristics. *Journal of Banking and Finance*, 30, 199-227.

Brearly, A. R., Myers, C. S., & Allen, F. (2011). *Principles of Corporate Finance* (10th ed.). New York, NY: McGraw-Hill/Irwin.

BRSA (2010). *From Crisis to Financial Stability: Turkey Experience* (Working Paper, Revised 3rd edition). Banking Regulation and Supervision Agency of Turkey (BRSA).

Buvinic, M. & Berger, M. (1990). Sex differences in access to a small enterprise development fund in Peru. *World Development*, 18, 695–705.

Cetorelli, N. & Peretto, P. F. (2012). Credit Quantity and Credit Quality: Bank Competition and Capital Accumulation. *Journal of Economic Theory* 147, 967-998.

Dell'Ariccia, G., Marquez, R. (2004). Information and bank credit allocation. *Jounal of Financial Economics* 72, 185–214.

De la Torre, A., Peria, S. M., & Schmukler. L. S. (2010). Bank Involvement with SMEs: Beyond Relationship Lending. *Journal of Banking and Finance*, 34(9): 2280-2293. doi: 10.1016/j.jbankfin.2010.02.014.

Demirguc-Kunt, A., Klapper, L., and Singer, D. (2013). *Financial Inclusion and Legal Discrimination against Women: Evidence from Developing Countries* (Policy Research Working Paper No. 6416). Development Research Group, The World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/15553/wps6416.pdf.

Ertugrul, A., Selcuk, F. (2001). A Brief Account of the Turkish Economy, 1980–2000. *Russian and East European Finance and Trade* 37(6), 6–30.

Fry, J. M. (1982). *Money, Interest and Banking in Economic Development*. John Hopkins University Press, Baltimore, USA.

Fuchs, M., Iacovone, L.,Jaeggi, T.,Napier, M.,Pearson, R.,Pellegrini, G., & Villegas Sanchez, C. (2011). *Financing Small and Medium Enterprises in the Republic of South Africa*. World Bank, Washington, DC.

Gormley, T.A. (2007). *Banking Competition in Developing Countries: Does Foreign Bank Entry Improve Credit Access?* Retrieved from https://www.researchgate.net/publication/228632463_Banking_Competition_in_Developing_Countries_Does_Foreign_Bank_Entry_Improve_Credit_Access.

Graham, R. J., & Leary, T. M. (2011). A Review of Empirical Capital Structure Research and Directions for the Future. *Annual Review of Financial Economics*, 3, 309-345. Retrieved from https://www2.bc.edu/thomas-chemmanur/phdfincorp/MF891%20papers/Graham%20and%20Leary%20A%20Review%20of%20Empricial%20Research%20in%20Capital%20Structure.pdf.

IFC (2010). *The SME Banking Knowledge Guide. IFC Advisory Services | Access to Finance* (2nd ed.) Washington, DC: IFC. Retrieved from https://www.ifc.org/wps/wcm/connect/b4f9be0049585ff9a192b519583b6d16/SMEE.pdf?MOD=AJPERES.

IFC (2013). Closing the Credit Gap for Formal and Informal Micro, Small, and Medium Enterprises. International Finance Corporation, Washington, D.C.

Irwin, D., & Scott, J.M., (2010). Barriers faced by SMEs in raising bank finance. *International Journal of Entrepreneurial Behaviour and Research* 16(3), 245–259.

Jenkins, H. (2014). The New Paradigm in Small and Medium-Sized Enterprise Finance: Evidence from Turkish Banks. *İktisat İşletme ve Finans*, 29(335): 45-72. doi: 10.3848/iif.2014.335.4020.

Jenkins, H., & Hossain, M. (2017). An Analysis of the Macroeconomic Conditions Required for SME Lending: Evidence from Turkey and Other Emerging Market Countries. *Panoeconomicus*, 64(1): 77-92. doi: 10.2298/PAN140213008J.

Koen, B. (2013). *The Turkish 2000-01 banking crisis. Rabobank,* Economic Research Department, September,2013. Retrieved from https://economics.rabobank.com/publications/2013/september/the-turkish-2000-01-banking-crisis/.

Kocabay, AK. S. (2009). *Bank Competition and Banking System Stability: Evidence from Turkey*. Masters Thesis, Middle East Technical University, Turkey.

Kraemer-Es, H., & Lang F. (2012). *The importance of leasing for SME finance* (Workig Paper No. 2012/15). Research & Market Analysis, European Investment Fund (EIF).

Kuntchev, V., Ramalho, R., Rodríguez-Meza, J., Yang, J. S. (2012). *What have we learned from the Enterprise Surveys regarding access to finance by SMEs?* Enterprise Analysis Unit of the Finance and Private Sector Development, The World Bank Group. Retrieved from https://www.enterprisesurveys.org/~/media/GIAWB/EnterpriseSurveys/Documents/ResearchPapers/Enterprise-Surveys-access-to-finance-and-SME.pdf.

Lago, R., Lopez, A., & Saurina, J. (2007). *Determinants of Access to External Finance: Evidence from Spanish Firms* (Working Paper No. 200722). Federal Reserve Bank of San Francisco.

La Porta, R., Lopezo-de-Silanex, F., Shleifer, A., & Vishny, R.W. (1998). Law and Finance. *Journal of Political Economy* 106, 1113-1155.

Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments Stock Portfolios and Capital Budgets. *Review of Economics and Statistics.* 47:1, pp.13–37.

Martin, G., & Staines, H. (1994). Managerial Competences in Small Firms. *Journal of Management Development*, 13 (7), 23-34. doi: 10.1108/02621719410063396.

McKinnon, R. (1973). *Money and Capital in Economic Development*. The Brookings Institution, Washington, DC.

Minh Le, P.N. (2012). What Determines the Access to Credit by SMEs? A Case Study in Vietnam. *Journal of Management Research*, 4 (4), 899-941. doi: 10.5296/jmr.v4i4.1838.

Myers, C. S. (1984). The Capital Structure Puzzle. *The Journal of Finance*, 39(3), 575-592. Retrieved from https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1540-6261.1984.tb03646.x.

Myers, C. S., & Majluf, S. N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221. doi: 10.1016/0304-405X(84)90023-0.

Nanyondo, M. (2017). *Access to Debt Finance and its Determinants in Uganda: An Empirical Investigation of Small and Medium-Sized Enterprises (SMEs)*. Doctoral thesis, Bournemouth University, UK. Retrieved from http://eprints.bournemouth.ac.uk/29249/1/NANYONDO%2C%20Mary_Ph.D.2017.pdf.

OECD (2004). *Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a More Responsible and Inclusive Globalization*, 2nd OECD Conference of Ministers Responsible for Small and Medium-sized Enterprises (SMEs), 2004 Istanbul, Turkey.

OECD (2015). *Progress Report on G20/OECD High Level Principles on SME Financing* (OECD Report to G20 Finance Ministers and Central Bank Governors). Retrieved from http://www.oecd.org/finance/G20-OECD-High-Level-%20Principles-on-SME-Financing.pdf.

OECD (2017). *Financing SMEs and Entrepreneurs 2017*. An OECD Scoreboard Highlights. Retrieved from https://www.oecd.org/cfe/smes/Financing%20SMEs%20and%20Entrepreneurs%202017_Highlights.pdf.

OECD (2018). *Enhancing SME access to diversified financing instruments* (Discussion Paper) SME Ministerial Conference, Mexico City, 22-23 February 2018. Retrieved from https://www.oecd.org/cfe/smes/ministerial/documents/2018-SME-Ministerial-Conference-Plenary-Session-2.pdf.

Özatay, F., & Sak, G. (2002), *Banking Sector Fragility and Turkey's 2000-01 Financial Crisis*, Brookings Trade Forum 2002: Currency Crises, Washington D.C.

Pandula, G. (2011). *An empirical investigation of small and medium enterprises Access to finance: The case of an emerging economy*. Proceedings of the ASBBS Annual Conference Las Vegas, pp. 255-273. Retrieved from http://www.researchbank.acu.edu.au/cgi/viewcontent.cgi?article=1865&context=flb_pub.

Peria, S. M. (2010) *Measuring Bank Competition: How Should We Do It?* All About Finance Blog, 12th August, 2010. WorldBank. https://blogs.worldbank.org/allaboutfinance/measuring-bank-competition-how-should-we-do-it.

Pehlivan, H, & Colin K., (1992). The Impact of Transnational Banks on Developing Countries' Banking sector: An analysis of The Turkish Experieance, 1980-1990. *British Journal of Middle Eastern Studies*, 19, 186-201.

Rajan, R., & Zingales, L. (1995). What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance*, 50 (5), 1421-1460. Retrieved from http://www.jstor.org/stable/2329322.

Rajan, R. & Zingales, L. (1998). Financial Dependence and Growth. *The American Economic Review*, 88 (3), 559-586. Retrieved from http://siteresources.worldbank.org/INTEXPCOMNET/Resources/Rajan_and_Zingales_1998.pdf.

Ross, A. S., Westerfield, W. R., Jordan, D. B. (2008). *Essential of Corporate Finance* (6th ed.). New York, NY: McGraw-Hill/Irwin.

Sarma, M. (2008). *Index of Financial Inclusion* (ICRIER Working Paper, August 2008). Retrieved from http://www.icrier.org/pdf/Working_Paper_215.pdf.

Sharpe, William. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance*. 19 (3), 425–42.

Sharpe, Steven A. (1990). Asymmetric Information, Bank Lending and Implicit Contracts: A Stylized Model of Customer Relationships. *Journal of Finance* 45, 1069-1087.

Shaw, E.S. (1973) Financial Deepening in Economic Development. Oxford University Press, New York, 1973.

Stiglitz, J., & Weiss, W. (1981). Credit Rationing in Markets with Imperfect Information, The *American Economic Review*, 71(3), 393-410.

UNECE. (2003). Entrepreneurship and SMEs: SMEs in Countries in Transition, Geneva: UN publications.

Ucer, M. (1998). Financial Liberalization and Inflation/Disinflation. Background notes prepared for an EDI seminar by World Bank, July 1998, Ankara, Turkey.

World Bank (2005). Economic Growth in the 1990s: Learning from a Decade of Reform. World Bank, Wahsington DC. USA. pp. 207–235.

World Bank. (2008). *Finance for All? Policies and Pitfalls in Expanding Access* (Policy Research Report). Washington, DC: World Bank. Retrieved from https://siteresources.worldbank.org/INTFINFORALL/Resources/4099583-1194373512632/FFA_book.pdf.

World Bank. (2011a). *Financing Small and Medium Enterprises in the Republic of South Africa.* Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/12687/704330ESW0P11800ZA0SME0Finance0Book.pdf?sequ.

World Bank (2011b). *Turkey Improving Conditions for SME Growth Finance and Innovation* (Report No. 54961-TR). Private and Financial Sector Development Europe and Central Asia Region.

Zarook, T., Mafizur, M., and Khanam, R. (2013a). Does the Financial Performance Matter in Accessing to Finance for Libya's SMEs? *International Journal of Business and Management*, 5(6).

Zarook, T., Mafizur, M., and Khanam, R. (2013b). The Impact of Demographic Factors on Accessing Finance in Libya's SMEs. *International Journal of Business and Management*, 8(14).