BETA
Bureau
d'économie
théorique
et appliquée

Documents de travail

« COLLATERAL REQUIREMENTS FOR SME LOANS: EMPIRICAL EVIDENCE FROM LEBANON COUNTRY»

Auteurs

Majida Jrad, Yamina Tadjeddine

Document de Travail n° 2020 – 46

Octobre 2020

Bureau d'Économie Théorique et Appliquée BETA

www.beta-umr7522.fr

@beta_economics

Contact :
jaoulgrammare@beta-cnrs.unistra.fr

Université de Strasbourg · cnrs · Université de Lorraine · INRAE · AgroParisTech

COLLATERAL REQUIREMENTS FOR SME LOANS:

EMPIRICAL EVIDENCE FROM LEBANON COUNTRY

Majida Jrad
Université de Lorraine, Université de Strasbourg, CNRS, BETA, 54000, Nancy, France
Yamina Tadjeddine
Université de Lorraine, Université de Strasbourg, CNRS, BETA, 54000, Nancy, France

Abstract

This paper examines the factors that affect the collateralizing of a loan specifically for SMEs in Lebanon that is a country with a small open emerging-market economy. Collateral should guarantee the bank loan but in practice it is adjusted according to other socio-economic criteria of companies. This is particularly true for SME's and even more so for emerging countries. We propose in this article to illustrate the signals mobilized by banks when providing collateralized loans. Data on these variables have been derived from the Lebanese Central Band and the World Bank. It contains observations for two samples – 532 firms for 2020 and 561 firms for 2014. Three sets of factors influence the level of collateral required: those related to firm characteristics (relevant variables: age, size, auditing financial statements, developing the qualification of workforce, export orientation, the sector of manufacturing, located in capital city, female manager, export orientation), to loan characteristics (no relevant variable), and to credit market specifics (interest rate). Regression estimates suggest the age and size of a firm contributed to more collateral required in 2019. Smaller collateral is required by firms with bigger size, auditing financial statements, developing the qualification of workforce, export orientation, belonging to the sector of manufacturing, located in capital city in 2013. Female manager, export orientation, and location in capital city contribute to smaller collateral required in 2019. Loan value does not seem to tighten collateral requirements. In opposite perspective, the increases in the interest rate entail stricter collateralizing the loans.

Keywords: Financing, SMEs, collateral, credit risk, regression analysis, Lebanon

JEL: G32 (Financing Policy); O16 (Corporate Finance); O53 (Middle East)

Introduction

Recent decades many scholars focus their research on the troubles the small and medium-sized enterprises (SMEs) face to acquire financing. These troubles are considered as financial constraints (Rahman, et al., 2017, p.650). The interest in this topic is motivated by the importance of SMEs for the overall economic landscape of each country, whether in developed or emerging countries. SMEs have main contribution to the growth of economy and the number of jobs (Ayyagari, et al., 2007). In emerging countries as Lebanon, whole economic sectors are dominated by small and medium-sized enterprises. Impediments to the development of SME's affect the other sectors of the economy and can hinder the country's economic growth. Therefore, by studying specifically the obstacles to SME financing in Lebanon, we contribute to an understanding of the economic fragilities faced in the countries where SMEs dominate.

A large literature in banking micro-economics and micro-econometrics, documents the fact that SMEs have more difficulties to acquire financing than large firms (Beck et al., 2006; Rahman, et al., 2017). The small size often is a reason for banks to suspect the credibility of firms and raise the guarantees required for returning back the amounts they have lent. Small firms are commonly expected to provide poor information and usually not producing audited financial statements that would cause difficulties for the banks to evaluate the credit quality of the borrowers (Berger & Udell, 2002). They are suspected to benefit from generating information asymmetry. Banks are compelled to establish long-term relations with small firms to overcome this informational problem (Carter et al., 2004; Berger & Udell 2006). It is typical for the Japanese model of banking but in other cases it would make the process of financing more expensive (Beck & Torre 2007). As a result, SMEs could not be enough competitive to attract external financing desired. As pointed, they may find it difficult to manage their credit risk properly and thus face strict terms when applying for bank loans (Rahman, et al., 2017, p.651).

Commercial banks impose requirements with respect to the credibility of the firms applying for loans. Their prior intention is to prevent credit defaults and assure successful collecting the loan provided. Along with other requirements, banks include collateral terms in the credit contracts as a better guarantee. The riskier the loan, the more restrictive the terms and the higher the collateral requirements are. In this sense, considering the SMEs as riskier borrowers suggest these firms would hold a larger share of the total number of collateralized loans. Reviewing the literature on the topic, Rahman, et al., (2017, p.651) pointed that collateral can alleviate adverse selection and moral hazard problems in a loan contract because collateral can act as a signaling device for banks to sort out quality borrowers from risky ones (Bester 1985; Chan & Kanatas 1985; Besanko & Thakor 1987; Boot et al. 1991). However, collateral requirement itself is considered among the most important obstacles for the SMEs to acquire external loans (Beck et al., 2006; Rahman, et al., 2017).

As implied, the role of collateral requirement in credit risk management has its place in the entire picture of banking studies. There are myriads of studies on this topic in terms of developed countries. There are lots of single-country studies as well as cross-country studies. Literature on this topic seems to be dominated by studies on

the American and European markets (Rahman, et al., 2017, p.652). Thus, our empirical paper is intended to contribute to the existing evidence on this topic by focusing on Lebanon's credit market. Data on these variables have been derived from the Lebanese Central Band and the World Bank. It contains observations for two samples – 532 firms for 2020 and 561 firms for 2014. The empirical study is based on correlation and regression methodology. The specific purpose of the paper is to examine the factors that affect the collateralizing of a loan in terms of a country with a small open emerging-market economy.

The emphasis will be put on the impact of firm characteristics, loan characteristics and market characteristics on the requirement for collateral. Moreover, the country is situated in Asia, in the region of the Near East whose credit market differs from these ones of Europe and the United States. The structure of the paper contains the following sections: first one provides theoretical background and review of the empirical evidence on the factors affecting collateral (collateral determinants). Second section describes the method of empirical analysis, variables chosen and data. Third section discusses the empirical results. The last section concludes.

1. Theoretical Background and Review of the Literature on Collateral's Determinants in SMEs collateral-based lending

1.1. Theoretical reasoning on collateral-based lending

Commercial banks aim at preventing the risk of credit default through efficient contacting. The contracts with borrowers include terms and conditions that have potential to guarantee returning back the amount lent to the borrower. Pledging a certain asset is a commonplace in contemporary banking. Nowadays, including collateral clause in the contracts is a standard way for overcoming information opacity and synchronizing the interests of borrowers and banks (Rahman, et al., 2017; Boot et al. 1991). Jensen and Meckling (1976) pay attention on the problem of asset substitution. Collateral-based lending has potential to prevent asset substitution and thus alleviates the agency problem. Myres (1977) links collateral-based lending with reduction of underinvestment problem.

More generally, collateral requirements should be understood in line with commercial banks' credit policies. The credit policies of those banks follow the lines settled by the central bank in conducting its monetary policy. Relaxing monetary policy will increase the supply of credit by commercial banks. Inversely, tightening of monetary policy is expected to reduce the supply of money and credit and thus increase the requirements imposed by the banks in applying for bank loan (Aiyar, Sh., et al., 2016). Collateral requirements, however, must not be

considered separately from the overall credit policy of the bank institutions in a country. The last one seems to be determined by the governmental regulations on banking as well as the central bank's monetary policy. Thus, the type of the policy would have an impact on the profusion of money into the system. Easy money that is intended to stimulate economic growth would relax credit requirements imposed by commercial banks. Inversely, tightening of monetary policy would reduce the money availability and would increase the requirements for obtaining bank loan (Aiyar, Sh., et al., 2016). These requirements inevitably include collateral requirements. Therefore, the collateral requirements would be directly determined by monetary policy which – on other hand – is determined by the macroeconomic dynamics and the phase of business cycle in particular (Kashyap, et al., 1993; Kashyap, et al., 1994; Disyatat, 2008).

Increased credit requirements would impede the crediting in entire economy. It is a commonplace; higher requirements for bank loan would put bigger firms in advantage. These firms could fulfil easy higher requirements and collateral requirements in particular. However, higher collateral requirements on a loan contract could have a more significant impact on SMEs than on large businesses because they lack physical assets for pledging as collateral (Rahman, et al., 2017; Menkhoff, et al. 2006).

1.2. Collateral's Determinants in SMEs collateral-based lending

The econometrics literature on SMEs collateral-based lending suggests differences between firms that provide collateral and firms do not (Rahman, et al., 2017). Along with this, collateral requirements could differ depending on firm characteristics, loan characteristics, and credit market specifics.

The first group of characteristics contains the widest set of factors with potential impact on the collateral banks would require. Banks strive with information asymmetry related to SMEs lending. Economists use firm size and age as inverse proxies for information asymmetry in SMEs lending and find that information transparency reduces collateral requirement (Rahman, et al., 2017, p.654). Along with these proxies, literature suggests using of audited financial statement, tangible asset, concentrated and even sole ownership, borrower experience, manager's gender, innovations, quality recognition, bribery incidence, personnel's quality, belonging to a certain economic sector, etc.

Older and bigger firms have an advantageous position on the credit market (Knyazeva & Knyazeva, 2012; Grunert & Norden, 2012; Menkhoff et al., 2006; Rahman, et al., 2017). They have longer credit history and larger values of balance sheet's assets so they could be considered as borrowers with a better credit quality. For these reasons, they could be required to provide lower collateral for bank loan. The same assumption is related to more transparent firms due to auditing on financial statements (Berger & Udell, 2002; Chakraborty & Hu, 2006; Ferri & Murro, 2015; Rahman, et al., 2017). The same literature relates the possession of tangible assets to higher level of transparency. Thus, belonging to manufacturing sector is expected to entail holding a higher share of tangible assets in balance sheet so it makes a firm more trustworthy.

The more concentrated the ownership, the lower the collateral required. It is predicted by the theory of agency (Rahman, et al., 2017). It is a commonplace that state ownership would put a firm in best position when applying for a bank loan (crowding-out effect). This paper will estimate what kind of impact private ownership on collateral pledge has.

Borrower experience and gender are also considered as important determinants of collateral-based lending (Rahman, et al., 2017, p.656). There are lots of studies emphasizing sexual stereotyping and its impact on the credit conditions from commercial banks (Carter & Rosa 1998; Garwe & Fatoki, 2012; Rahman, et al., 2017, p.656). The borrower could be considered as a risky one on the base of the following proxies: loan default, liquidity risk, overdue payments, crime and bribery incidence (Jimenez et al., 2006; Hanedar et al. 2014; Rahman, et al., 2017, p.656).

Positive image of a firm could be benefited from holding internationally recognized quality certification as well as maintaining the quality of the workforce hired. The last one is visible by the practice of a firm to provide its own personnel with trainings for improving professional qualification. This paper includes estimates on the relationship between proxies for positive image and collateral required.

In combination with the positive image proxies and belonging to a certain economic sector, the usage of the export orientation of firm would be a useful factor for explanation of collateral requirements in terms of a small open economy. The present paper envisages using of such a proxy.

The second group of factors influencing collateral requirements concerns the loan characteristics. Loan size and duration enjoy the widest popularity. Along with them, interest rate also is widely accepted in empirical studies. Lots of studies see a positive relation between loan size and credit risk that implies the same link with collateral pledges (Leeth & Scott 1989; Avery et al. 1998; Degryse & Cayseele 2000; Godlewski & Weill 2011; Rahman, et al., 2017). Long-term loans would be associated with more risk than those with a shorter maturity. It is commonplace that loan maturity is expected to correlate with collateral (Duarte et al. 2017; Rahman, et al., 2017).

According to the observed risk hypothesis, Rahman, et al., (2017, p.657) expect a positive association between collateral and interest rates. Their reasoning suggests borrowers may provide more collateral to obtain loans with lower interest rates and thus collateral acts as a substitute for lower interest rates.

Bank competition, concentration and distance between bank and borrower are recognized as factors with potential to describe lender market. Location of a firm in capital city would be a suitable proxy for concentration and development of lender market in an emerging-market economy. For this reason, such a proxy is adopted in the present paper.

The influence of these groups of factors on the terms of loan contracts for pledging has been studied in terms of various samples of countries. It is unmissable to note the intensive research on the determinants of SMEs lending in terms of Lebanon. Lebanon's case is studied alone as well as in sample with other Middle East and

Northern African countries. Canaan (2011) studies the impact of the Lebanese credit guarantee scheme and found no evidence for establishing long-term credit relationships between banks and SMEs. Naimy (2010) found a serious problem of financing faced by the Lebanese SMEs. She concluded that granting a credit requires satisfaction of almost impossible conditions to be fulfilled by these firms. Studying a group of less-developed countries, Hanedar, et al. (2014) found that borrower-specific variables are more important than country-specific variables in determining collateral requirements on loan contracts. The strongest evidence in their paper is in favor of the importance of borrower risk and loan cost in collateral determinants. The cross-country study Baliamoune-Lutz and Lutz (2016) examines the link between gender and firm performance in Middle Eastern and African economies. Their paper gives an interesting conclusion that implies that female-owned firms acquire more debt financing in those cases the resulting performance improvement is significantly greater than for other firms. In their opinion, existing financing constraints appear as a major factor in holding female-owned firm performance back in the Middle East and Africa.

2. Empirical Methodology and Data

2.1. Method and Variables

Following the study of Rahman et al., (2017) we specified a simple regression model. Considering the nature of our dependent variable we use logistic regression since the nature of the dependent variable is *Collateral* that has two possible cases: exist or no. The model is specified as follow:

$$C_i = \alpha + \beta_1 * FC_i + \beta_2 * ES_i + \beta_3 * LC_i + \beta_4 * LMC_i + \varepsilon_i$$

where C_i is a binary variable that takes value of one in each case of collateralized loan. The FC_i is a set of variables representing the firm characteristics. The ES_i includes belonging to the manufacturing sector of economy. The LC_i includes the most representative loan characteristics – size of loan and interest rate. The LMC_i is a proxy for development of credit market that is location of a firm in the capital town. The parameter α is the constant value in the equation and $\beta_{1,2,3,4}$ are regression coefficients. The component of ε_i expresses the error term of the regression.

Before regression estimates we will estimate the descriptive features and the mutual correlation relations of the variables.

The set of the variables that characterizes the Lebanon's firms includes proxies for size, age, requirement for annual audit, private ownership, female manager, workforce, bribery incidence quality, and export orientation. Proxies for economic sector are also included here. There is included a proxy for belonging to the manufacturing sector of economy. These variables are of binary type except the size and age. Having an

internationally-recognized quality certification is adopted as a proxy for quality. The binary variable of export orientation is consisted of data on the firms exporting directly or indirectly (at least 10% of sales).

Loan value and interest rates have been adopted as proxies for loan characteristics. Both the variables are closely related to and concentrated on loans. No one of these variables is of binary type.

The binary variable representing the location of one firm in the capital town of a country is adopted as a proxy for development of the loan market. The conventional economic wisdom predicts that the market and income-levels are bigger in the capital town in comparison with the countryside. It implies a higher concentration of firms, banks and financial institutions. There, the competition among the banks is more intensive and the formal requirements could be expected to be laxer.

2.2. Data

The data on the first and third sets of variables have been derived from the database of the Word Bank. The data on the loan value and interest rates have been derived from the database of the Central bank of Lebanon. The values are taken in averaged terms.

As pointed, the data have been derived from the database of the World Bank, Enterprise Surveys, What Businesses Experience. The raw data in this section of the World Bank's database have been accumulated through interviewing business owners and top managers between May 2019 and April 2020. These data include polls filled in by the representatives of 532 firms. Estimates will be run on data for second sample of firms. These data have been collected between April, 2013 and September, 2014. In this survey, owners and top managers of 561 firms are interviewed. Thus, all these 532 and 561 cases are taken to fill in the observations of the variables in both the samples of empirical study of the present paper.

The raw data are collected from firms in all the sectors of economy. Firms from all the sizes have been included in the process of interviewing. Firms with 5-19 employees are defined as small firms. Firm hired between 20 and 99 are defined as medium-sized ones. Those having 100 and more employees are considered as large firms. Firms from all the regions of Lebanon have been interviewed for collecting raw data. These regions are Mount Lebanon, Beirut, South Lebanon, Bekaa Valley, North Lebanon, and Nabatieh.

Table 1: *Definitions and sources of the variables in regression model*

Variable	Definition	Source
Collateral (COLL)	Depended variable; Binary variable which takes value 1 if a firm has pledged collateral to receive an external loan	World Bank
Size (SZ)	Size of firm, measured as the average number of full-time employees	World Bank
Age (AG)	Age of firm, measured as the average number of the years of existence	World Bank
Audit (AUD)	Binary variable which takes value 1 if the firm's annual financial statement is audited by external auditors	World Bank
Ownership (OWN)	Binary variable which takes value 1 if a firm is owned by private shareholders	World Bank
Female (FM)	Binary variable which takes value 1 if a firm's top manager is female	World Bank
Quality (QUA)	Binary variable which takes value 1 if a firm has an internationally recognized quality certification	World Bank
Exporter (EXP)	Binary variable which takes value 1 if a firm exports directly or indirectly (at least 10% of sales)	World Bank
Workforce (WFT)	Equal 1 if the firm offer trainings to its workers	World Bank
Bribery Incidence (BI)	Equal 1 if firms experiencing at least one bribe payment request	World Bank
Manufacturing (MAN)	Binary variable which takes value 1 if a firm operates in the manufacturing sector	World Bank
Loan value (LV)	Average amount of money that a firm has received as a loan from an external financial institution (bank)	Lebanese Central bank
Interest rate (IR)	Average value of the basic interest rate owed on a bank loan	Lebanese Central bank
Capital city (CC)	Binary variable which takes value 1 if a firm is located in the capital town of Lebanon	World Bank

3. Empirical Results

As a starting point, the descriptive statistics are systematized in Annex 1. It is estimated by using data on 2019. Each variable's empirical distribution is different from the theoretical symmetric normal distribution. Along with the skewness and kurtosis, the deviation from normal distribution is confirmed by the test of Jarque-Bera which pulls normal distribution as a null hypothesis. Thus, statistically significant empirical result would reject the null hypothesis. The Jark-Bera procedure rejects the null hypothesis for each variable.

Correlation matrix provides interesting information for the mutual relations in each combination of variables (Annex 2). The most valuable information is about the relations among the independent variables. Strong correlations are estimated between collateral requirement and almost all other variables. Moreover, the strongest ones are between collateral and loan value and interest rate. Strong correlation is found between collateral and

export orientation as well. While the first ones are fully inspired by the conventional economic wisdom, the second relation is a specific for the Lebanon's case. There is found another interesting high coefficient of correlation between loan value or interest rate and bribery incidence. This relation would raise a theoretical discussion not only for Lebanon but also for worldwide.

The results from the regression parameters' estimation are presented in a separate table (Table 2). The table includes estimates on the model for both the years of interest – 2013 and 2019. The model is separated into two specifications so the second one's right side contains the variables of loan value and interest rate. All the estimates show the model has a high explanatory power of the model.

As seen, the size of a firm is factor that inspires trust in the credit institutions. Thus the bigger the firm is, the smaller the collateral needed. The positive coefficient is significant at a low level of the error probability in terms of 2013 sample. The sample of 2019 provides an opposite result. No contradiction between these results, if both the results are interpreted in the view of the deep economic thought. 2013 was a year of the very beginning of the post-crisis economic recovery. It was a beginning of a long upward movement of the economic cycle. Later, 2019 is a year that is on the peak of the cycle and would be considered as a beginning of a downward moving. The firms have taken enough debt to finance their positive development in the years of overall economic increase. Not surprisingly, many factors inspiring trust in first years of the cycle don't work in the final years of the present cycle's movement. This result could be also understood in line with the statement of Beck *et al.* (2006) that SMEs have higher financing difficulties than large firms. With respect to these firms, credit institutions require better guarantees for returning back the amounts they have lent. 2013's results are contrary to the positive coefficient of Rahman, et al., (2017).

The age of a firm is associated with higher collateral needs. The coefficient is positive and statistically significant at a low level of p-value in terms of 2013 sample. The result contrasts the coefficient estimated in terms of 2019 sample. The last state is more peculiar to the developed economy in a phase of increasing. The first result is contrary of the finding of Rahman, et al., (2017) that could reflect Lebanese economic specifics at the early stage of upward cyclical moving.

Table 2: *Regression results*

Variable	2013		2019	
	Model 1	Model 2	Model 3	Model 4
Size	-0,030*** (0,006)		0,142** (0,502)	
Age	0,096*** (0,029)		-1,592** (0, 470)	
Audit	-2,931*** (0,437)		0,843 (0,889)	
Ownership	0,848 (0,935)		-0,251 (0,789)	
Female	-0,079 (0,686)		-0,275* (0,530)	
Workforce	-1,189*** (0,405)		0,481 (0,919)	
Quality	-0,590 (0,538)		1,426 (0,964)	
Exporter	-0,873** (0,374)		-0,925*** (0,326)	
Bribery Incidence	0,703 (0,488)		0,003 (0,081)	
Manufacturing	-2,055*** (0,351)		1,410** (0,623)	
Capital city	-0,472* (0,208)		-0,191* (0,511)	
Loan value		0,011 (0,082)		-1,128* (0,719)
Interest rate		0,001 (2,130)		1,455* (0,945)
(constant)	1,512** (0,729)	-0,108 (0,110)	1,819** (0,398)	6,203 (2,120)
-2 Log-Likelihood	361,110	517,406	105,639	176,401
Nagelkerke R Square	0,680	0,384	0,918	0,853
Observations	561	561	532	532

Source: Author's calculation

Note: standard error in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%

The coefficients imply that the firms with an annual financial statement reviewed by external auditors are these firms whose loans have required smaller collateral. The coefficient has a negative sign. The level of p-value makes the result reliable empirical evidence. Undoubtedly, applications for collateralized loans often require annual statement verified by an external auditor. This result is in full accordance with the theoretical predations and contrary to the regression result of Rahman, et al., (2017). The significance of the coefficient, however, disappears when estimated in terms of 2019 sample.

Private ownership is not a factor strongly related to collateral requirements. The regression coefficient is statistically insignificant in terms of both the samples and thus domestic private owners would not be necessarily required to provide collateral.

Female top manager of a firm seems to be a factor inspiring trust in the lending banks. The negative sign of the coefficient means that the firms with female managers are more often among the firms whose loans are less

collateralized. This conclusion could be accepted as proved because of the significant regression coefficient in terms of 2019 sample. The result is in full accordance with the findings of Baliamoune-Lutz and Lutz (2016). Present coefficient is contrary to the result of Rahman, et al., (2017) who found a positive and statistically significant relation between female manager and collateral. Lebanese economy could be considered as much more modern than a wide range of European economies.

Developing workforce through providing trainings is positively accepted by Lebanon's credit institutions. Engagement in long-term development of workforce is typical for bigger and well positioned firms. These firms are ones with better credibility that is understandable for the banks. The regression coefficient is negative and statistically significant. Its significance disappears in terms of 2019 sample.

Having an internationally-recognized quality certification seems to be a fact with potential to impress the banks in Lebanon. The coefficients estimated on both the samples are statistically insignificant. These results are in partial accordance with the result of Rahman, et al., (2017) who found a positive and insignificant coefficient in terms of the Visegrad countries.

The export orientation has a similar relation to collateralizing of loans as the quality certifications. Both the coefficients have negative signs. The negative relation of export orientation with collateral is statistically significant in terms of 2019 sample. The 2013 coefficient that quantifies the relation between holding quality certificates and collateral is not significant that makes the result similar to this of Rahman, et al., (2017). The strong relation found in 2019 is a peculiarity of Lebanon's economy as a small open economy.

Experiencing at least one bribe payment request has no significant regression effect on the collateral requirements. The link is positive but not enough verified. This result differs from the significant coefficient of regression between crime and collateral that Rahman, et al., (2017) found.

The model introduces the belonging to a certain economic sector as a factor with potential effect on the collateral required for a loan. Belonging of a firm to the sector of manufacturing entails visibly lower collateral requirements in 2013. Then the manufacturing firms had held fewer collateralized loans. The negative coefficient is statistically significant at a low level of p-value are supported by theoretical predictions and coincides with the finding of Rahman, et al., (2017). The influence of this factor, however, is fully changed in 2019. The association is positive that witnesses the tightened requirements for lending and the utilized and even exhausted capacities of the firms to take new debt in 2019.

The location of a firm is a proxy for development of a loan market. No doubts the market in the capital town is the most developed one. There is fierce competition among banking institutions for attracting clients. On other side, the firms in the capital towns are more efficient in their performance than those in countryside. All these things contribute to the negative relation between location in capital city and collateral needed. The negative coefficient is significant at a relatively high level of error probability. This result is similar to this found by Rahman, et al., (2017).

Second model adds the loan value and interest rate in estimation. Both the variables are suggested by the conventional economic wisdom. Undoubtedly, the increases in the value of a loan and interest rate will entail a proportional increase in the collateral needed. These insights have not been confirmed by the regression coefficients which are negative and significant in terms of 2019 sample. The coefficient for the impact of the interest rate in 2013 is too low that could be understood as not prior importance of the loan for the collateral requirements. The picture is quite different in 2019 when the positive coefficient is extremely high and significant. These results have their fundamental explanations in the specifics of the development of Lebanon's economy. Other studies also found the same associations of these factors with collateral. For example, Rahman, et al., (2017) estimated a positive coefficient for the impact of interest rate.

Conclusions

Collateral-based lending is a common practice of commercial banks to minimize the risk associated with the amounts lent to borrowers of various kinds. There are lots of factors that influence the existence of collateral under a loan contract. Economists have summarized these factors into three groups - firm characteristics, loan characteristics, and credit market specifics.

Our empirical study has regressed proxies of these groups with the presence of collateral in a loan contract in terms of Lebanon that is a country with a small open emerging-market economy. What is more, this paper provides estimates in terms of samples of two different years – 2013 and 2019. The first year is in the beginning of the upward post-crisis economic recovery. The upward cyclical movement ends in 2019. Thus, the regression links looks different in each year that reflects both the specifics – those of the phase of the cycle and those of the Lebanon's economy.

Regression estimates suggest the age and size of a firm contributed to more collateral required in 2019. Smaller collateral is required by firms with bigger size, auditing financial statements, developing the qualification of workforce, export orientation, belonging to the sector of manufacturing, located in capital city in 2013. Female manager, export orientation, and location in capital city contribute to smaller collateral required in 2019.

Loan value does not seem to tighten collateral requirements. In opposite perspective, the increases in the interest rate entail stricter collateralizing the loans. Both the variables have significant reflection on the collateral required in the year of the peak of economic cycle. Loan value is negatively associated with the presence of collateral in 2019. In all cases, higher loan amounts have been granted to trustworthy firms which have long-term relations with crediting bank. In this year, banks would not pursue enhancing their credit expansion winning new clients and thus taking new risks. From an opposite perspective, the increases in the interest rate have entailed stricter collateralizing the loans. Higher interests should have been imposed on riskier credits that seem to be more visible in 2019. Not inevitably pursuing new clients and thus taking new risks, banks would require higher

interests and collaterals for riskier credits because marginal profit from each new client in 2019 is far smaller than that in 2013. In general, the present study supported the assumption that macroeconomic dynamics and business cycle really matter in credit supply and accessibility.

These results contribute to the entire picture on the empirical evidence on the topic of interest. They coincide with ones and contradict to others. Most of the coefficients of this paper are contrary to the findings in terms of Visegrad countries. It is commonplace that economic conditions are quite different in both kinds of countries. What is more, credit conditions seem to differ across the different phases of economic cycle in one country. The present paper provided empirical results that are in better accordance with the conclusions of similar studies on Lebanon as well as cross-country samples of Middle East and Northern African countries.

References

Aiyar, Sh., Calomiris, Ch.W., and Wieladek, T. (2016). How does credit supply respond to monetary policy and bank minimum capital requirements? *European Economic Review, 82,* 142-165

Avery, RB., Bostic, R., & Samolyk, K. (1998). The role of personal wealth in small business finance. *Journal of Banking and Finance, 22,* 1019-1061.

Ayyagari, M., Beck, T., & Demirgüç-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics, 29,* 415–434.

Baliamoune-Lutz M. & Lutz St. (2017). *Financing and performance of female-owned firms in Middle Eastern and African Economies*. Instituto Complutense de Análisis Económico, WP1709. Available at: https://eprints.ucm.es/41075/1/1709.pdf

Berger, AN., & Udell, GF. (2002). Small business credit availability and relationship lending: the importance of bank organisational structure. *The Economic Journal, 112(477),* 32–53.

Berger, AN., & Udell, GF., (2006). A more complete conceptual framework for SME finance. *Journal of Banking and Finance, 30,* 2945–2966.

Beck, T., & Torre, A. de la, (2007). The basic analytics of access to financial services. *Financial Markets, Institutions and Instruments, 16(2),* 79–117.

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

Bester, H. (1985). Screening versus rationing in credit markets with imperfect information. *American Economic Review,* 75(4), 850-885.

Besanko, D. & Thakor, A. (1987). Collateral and rationing: sorting equilibria in monopolistic and competitive credit markets. *International Economic Review,* 28, 671-689.

Boot, AW., Thakor, AV., & Udell, GF. (1991). Secured lending and default risk: equilibrium analysis, policy implications and empirical results. *Economic Journal, 101(406),* 458-472.

Canaan, S. (2011), *The determinants of expansion of SMEs under a partial credit guarantee scheme: the case of Lebanon*. The Economic Research Forum, Egypt. WP 624. Available at: http://erf.org.eg/wp-content/uploads/2014/08/624.pdf

Carter, S., & Rosa, P. (1998). The financing of male and female-owned businesses. *Entrepreneurship and Regional Development, 10,* 225 – 241.

Carter, DA., McNulty, JE., & Verbrugge, JA. (2004). Do small banks have an advantage in lending? An examination of risk-adjusted yields on business loans at large and small banks. *Journal of Financial Services Research*, 25, 233–252.

Chakraborty, A., & Hu, CX. (2006). Lending relationships in line-of-credit and nonline-of-credit loans: evidence from collateral use in small business. Journal of Financial Intermediation, 15, 86-107.

Chan, YS. & Kanatas, G. (1985). Asymmetric valuations and the role of collateral in loan agreements. *The Journal of Money Credit and Banking, 17,* 84-95.

Degryse, H. & Cayseele, P. van, (2000). Relationship lending within a bank-based system: evidence from European small business data. *Journal of Financial Intermediation, 9,* 90-109.

Duarte, FD., Gama, APM., & Esparanca, JS. (2017). Collateral-based in SME lending, the role of business collateral and personal collateral in less developed countries. *Research in International Business and Finance, 39,* 406-422.

Disyatat, P. (2008). Monetary Policy Implementation: Misconceptions and Their Consequences. *BIS Working Paper No. 269.*

Ferri, G. & Murro, P. (2015). Do firm odd couples exacerbate credit rationing. *Journal of Financial Intermediation, 24,* 231 – 251.

Garwe, DK., & Fatoki, O. (2012). The impact of gender on SME characteristics and access to debt finance in South Africa. *Development Southern Africa, 29(3),* 448-461.

Godlewski, CJ., & Weill, L. (2011). Does collateral help mitigate adverse selection? A cross-country analysis, *Journal of Financial Services Research, 40,* 49-78.

Grunert, J., & Norden, L. (2012). Bargaining power and information in SME lending. *Small Business Economics,* 39, 401-417.

Hanedar, EY., Broccardo, E., & Bazzana, F. (2014). Collateral requirements of SMEs: the evidence from less developed countries. *Journal of Banking and Finance, 38,* 106 – 121.

Jensen, M., & Meckling, W. (1976). Theory of the firm, managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics, 5,* 305-306.

Jimenez, G., Salas, V., & Saurina, J. (2006). Determinants of collateral. *Journal of Financial Economics,* 81, 255-281.

Knyazeva, A. & Knyazeva, D. (2012). Does being your bank's neighbour matter?. *Journal of Banking and Finance, 36,* 1194-1209.

Kashyap, A.K., Stein, J.C., and Wilcox, D.W. (1993). Monetary policy and credit conditions: Evidence from the composition of external finance., *American Economic Review, 83,* 78-98.

Kashyap, A.K., and Stein, J.C. (1994). Monetary policy and bank lending, in Mankiw, N.G., (eds.), *Monetary policy*, 221-256, University of Chicago Press, Chicago.

Leeth, JD., & Scott, JA. (1989). The incidence of secured debt: evidence from the small business community. *Journal of Financial and Quantitative Analysis, 24(3),* 379-394.

Menkhoff, L., Neuberger, D., & Suwanaporn, C. (2006). Collateral based lending in emerging markets: evidence from Thailand. *Journal of Banking and Finance, 30,* 1-21.

Myres, SC. (1977). Determinants of corporate borrowing. *Journal of Financial Economics, 5(2),* 147-175.

Naïmy, VY. (2010). Financing problems faced by the Lebanese SMEs: an empirical study. *International Business & Economics Research Journal,* 3(1), 27-38.

Rahman Ash., Belas J., Kliestik T., & Tyll, L. (2017). Collateral requirements for SME loans: empirical evidence from the Visegrad countries. *Journal of Business Economics and Management, 18(4),* 650–675.

The World Bank. (2014). Enterprises Surveys. What Businesses Experience. Lebanon. Available on: <https://www.enterprisesurveys.org/en/data/exploreeconomies/2013/lebanon>

The World Bank. (2019). Enterprises Surveys. What Businesses Experience. Lebanon. Available on: <https://www.enterprisesurveys.org/en/data/exploreeconomies/2019/lebanon>

ANNEXEX 1

Descriptive statistics, 2019

	AG	AUD	BI	CC	COLL	OWN	EXP	IR	FM	MAN
Mean	26,939	0,870	0,216	0,216	0,355	0,969	0,250	3,059	0,063	0,287
Median	24,700	1,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Maximum	34,700	1,000	1,000	1,000	1,000	1,000	1,000	7,390	1,000	1,000
Minimum	24,700	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Std, Dev,	3,099	0,336	0,412	0,412	0,479	0,170	0,433	3,619	0,244	0,453
Skewness	1,557	-2,204	1,379	1,379	0,604	-5,503	1,154	0,336	3,565	0,938
Kurtosis	4,529	5,859	2,901	2,901	1,365	31,281	2,333	1,113	13,713	1,880
Jarque-Bera	266,983	612,063	168,856	168,856	91,635	20414,2	128,041	88,880	3672,6	105,85
Probability	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sum	14331,80	463,000	115,000	115,000	189,000	516,000	133,000	1627,78	34,000	153,00
Sum Sq. Dev.	5096,231	60,055	90,148	90,148	121,853	15,510	99,750	6956,34	31,827	108,98
Observations	532	532	532	532	532	532	532	532	532	532

Source: Author's calculation

Continued

	LV	QUA	SZ	WFT
Mean	79,458	0,195	39,263	0,242
Median	0,000	0,000	12,000	0,000
Maximum	190,414	1,000	100,000	1,000
Minimum	0,000	0,000	12,000	0,000
Std. Dev.	93,984	0,396	30,943	0,428
Skewness	0,335	1,535	0,591	1,201
Kurtosis	1,112	3,358	2,043	2,444
Jarque-Bera	88,947	211,956	51,297	134,895
Probability	0,000	0,000	0,000	0,000
Sum	42272,00	104,000	20888,00	129,000
Sum Sq. Dev.	4690322,0	83,669	508447,2	97,719
Obs.	532	532	532	532

Source: Author's calculation

ANNEX 2

Correlation Matrix, 2019

	AG	AU	BI	CC	COLL	OWN	EXP	FM	IR	LV	MAN	QUA	WST	SZ
AG	1.000													
AU	0.063	1.000												
BI	0.083	0.195	1.000											
CC	0.251	0.128	0.364	1.000										
COLL	0.068	0.574	0.340	-0.089	1.000									
OWN	-0.001	0.398	0.077	0.081	0.228	1.000								
EXP	0.122	0.321	0.608	0.217	0.559	0.128	1.000							
FM	-0.045	0.085	0.331	0.416	0.148	0.035	0.265	1.000						
IR	0.110	0.321	0.607	0.214	0.559	0.128	0.999	0.267	1.000					
LV	0.122	0.321	0.608	0.217	0.559	0.128	1.000	0.265	0.999	1.000				
MAN	0.217	0.007	0.021	0.712	-0.322	0.012	-0.032	0.375	-0.034	-0.032	1.000			
QUA	0.391	0.192	0.605	0.385	0.334	0.076	0.598	0.444	0.589	0.598	0.178	1.000		
WST	0.262	0.255	0.669	0.185	0.444	0.102	0.676	0.224	0.672	0.676	-0.105	0.607	1.000	
SZ	0.311	-0.114	0.042	0.315	-0.290	0.368	0.588	0.037	-0.499	0.551	0.271	0.074	0.361	1.000

Source: Author's calculation