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Determinants of Access to Bank Financing in SMEs in Mexico

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Abstract: Several empirical studies indicate that the lack of financing is one of the main barriers that affects the economic growth of small and medium enterprises (SMEs). The main objective of this investigation was to determine to what extent the economic sector, the enterprise size, the characteristics inherent to the enterprise, the legal status, the variables linked to the performance of the enterprise, and the attributes of the owner influence the access to the bank financing of SMEs in Mexico. Using a discrete-response probit regression model, the impact of enterprise characteristics on the probability of obtaining a bank loan was determined. The data collected are from the Enterprise Surveys of Mexico, carried out by the World Bank. The sample of 1480 enterprises is representative by enterprise size, by economic sector, and by region. The research has a quantitative approach with a correlational scope, and a nonexperimental and transectional design. One of the main results highlights that the determinants with the greatest influence on access to bank financing are: the age, the small size, foreign participation, and the manufacturing sector. These results are consistent with other empirical studies, as well as with the pecking-order theory and the financial life-cycle theory.

Keywords: credit demand; loan; bank financing; SMEs; probit model

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1. Introduction

SMEs are a key element for the economic development of Mexico; they represent 4.9% of all enterprises in the country, provide 30.7% of jobs, and contribute 31% of added value (National Institute of Statistic and Geography 2020). However, various empirical studies indicate that the lack of financing is one of the main barriers that affects the economic growth of SMEs, and that the smallest enterprises are the most affected by this limitation. According to Kumar et al. (2020), studies on the capital structure of SMEs have generated great relevance in recent years due to the economic importance of these enterprises for the countries, and because most of the research on capital structure has been carried out only in large enterprises.

SMEs have severe problems of limited access to external financing due largely to the information asymmetry between SMEs and lenders (López-Gracia and Sogorb-Mira 2008; Martinez et al. 2019; Xiang et al. 2015). Furthermore, they are usually owned and managed by a single director or a very few who are not interested in sharing control of the business. For these reasons, SMEs depend more on internal resources, making them more vulnerable to high business mortality (López-Gracia and Sogorb-Mira 2008).

According to data from the World Bank's Enterprise Surveys, in 2017, around 27% of enterprises in Latin America and the Caribbean considered that access to financing is the most important barrier to their growth, a figure higher than the average of the countries surveyed, which is 26.1%, while in Mexico, this limitation is 29.6% (World Bank 2017).

The quarterly survey of the conjunctural evaluation of the credit market indicates that there is a large gap in access to bank financing between SMEs and large enterprises. SMEs with bank debt, as of December 2021, represented 35.3%, while in large enterprises, it was

56.1%. SMEs indicated that the main factors that limited the use of bank loans were the interest rates on bank credit (59.8%), the general economic situation of the country (59.5%), access to public support (50.9%), the conditions to access bank credit (50.3%), the amounts required as collateral (50.1%), sales and profitability (44.8%), the willingness of banks to grant loans (43.7%), among others. It is also highlighted that SMEs report having greater limitations than large enterprises to access bank loans (Bank of Mexico 2022a, 2022b).

Among the modern theories that address research on the behavior of enterprises in relation to the request for financing (credit demand) is the pecking-order theory and the financial life-cycle theory; both theories have been studied in the context of SMEs. There are several factors that limit access to bank financing, which can be classified into three aspects: (a) those related to the country's economy, (b) those related to the banking system, and (c) those related to the characteristics inherent to the enterprises. In this sense, the various investigations on this object of study are focused from the perspective of the supply or demand for bank credit. Therefore, this research focuses on the study of the determinants of bank financing from the scope of the characteristics of SMEs and the attributes of their entrepreneurs; that is, from the perspective of credit demand.

The general objective was to determine to what extent the economic sector, the enterprise size, the characteristics inherent to the enterprises, the legal status, the variables linked to the performance of the enterprise, and the attributes of the owner influence the access to the bank financing of SMEs in Mexico.

Using a discrete-response probit regression model, the impact of the characteristics of SMEs on the probability of obtaining a bank loan was determined. The technique used was the collection of secondary data from the Enterprises Survey of Mexico, carried out by the World Bank. The sample of 1480 enterprises is representative by enterprise size (small, medium, and large), by economic sector (manufacturing, commerce, and services), and by region. Due to these characteristics, the research has a quantitative approach with a correlational scope, and a nonexperimental and transectional design.

One of the main results highlights that the variables with the greatest influence on the probability of obtaining a bank loan are the age of the enterprise, the small size, foreign participation, and the manufacturing sector. In other words, younger, smaller, foreign-owned, and nonmanufacturing enterprises have the least probability to access bank financing. These results are consistent with other empirical studies analyzed in this research, as well as with the pecking-order theory and financial life-cycle theory.

2. Literature Review

2.1. Theoretical Framework of Business Financing

2.1.1. Pecking-Order Theory

In the pecking-order theory, a hierarchical order of preferences for enterprise financing is established: first, they are financed through internal sources, such as retained earnings and partner contributions; secondly, if they need additional resources, they will request bank loans; ultimately, they issue new equity (Donaldson 1961; Myers 1984; Myers and Majluf 1984). It is considered that this theory applies to small enterprises due to their restricted access to the capital market caused by the little information available, which makes it impossible to know the quality of the management of this type of enterprise, which is why lenders choose to protect their resources through short-term repayments as a measure to protect their investment. In this sense, small entrepreneurs are forced to obtain short-term business loans, but at a high cost (Chittenden et al. 1996).

López-Gracia and Sogorb-Mira (2008) point out that SMEs apply the pecking-order theory in financing decisions. This order is directed by the financial sources that are subject to less information costs and less risk. Internal funds are the main source of financing, followed by lower-risk short-term debt and then higher-risk long-term debt. The last option is to resort to new capital, which is the source of financing with high information costs.

The assumptions that support the financial hierarchy theory offer a better explanation of the capital structure adopted by SMEs. The asymmetry of information, as well as

the motivation of current shareholders to maintain control and corporate ownership, are relevant factors that condition the choice of financing sources (Ferrer and Tresierra 2009). In the same sense, Yazdanfar and Öhman (2016) indicate that the owners or managers of SMEs choose to be autonomous and maintain control of their enterprises, which is why they follow a hierarchical order in financing decisions, preferring first internal sources than external ones.

In this sense, the limitation that SMEs have to access financing originates from the information asymmetry problems between borrowers and lenders, which implies information costs derived from these asymmetries. SMEs prefer internal sources of financing that imply less information costs and less risk (Briozzo et al. 2016a). Due to the difficulty in accessing long-term sources of financing, there is a higher probability that young SMEs follow the pecking-order theory than the compensation theory predicts (Serrasqueiro and Nunes 2012).

2.1.2. Financial Life-Cycle Theory

The financial life-cycle theory establishes that the financial needs of enterprises change as their life stages progress. As the firm grows and ages, gains more experience, and the availability of information increases, its financial needs and financing options change (Berger and Udell 1998). During the cycle of financial growth, and derived from the reduction of information asymmetries, the enterprise has changing financial needs and can resort to other sources, in addition to the internal ones, such as venture capital, and loans from financial institutions, starting with the short term and, later, in the long term (Briozzo et al. 2016b).

Berger and Udell (1998) indicate that enterprises develop through a financial growth-cycle paradigm in which different capital structures are optimal at different points in the cycle. In this way, when enterprises are young and small, they are less transparent in their financial information, so they are financed with their own resources, including resources from family and friends. As it grows, access to commercial credit or through business angels increases. Over time, if the enterprise continues to grow, it may turn to venture capital institutions, the debt market, or public capital (Guercio et al. 2017).

Briozzo et al. (2016b) point out that there is a relationship between the life cycle of enterprises and their owners. As enterprises and their owners grow, information asymmetries are reduced, making access to financing easier. On the other hand, the older the enterprise, the more risk aversion and the personal costs of bankruptcy increase, factors that discourage the use of external financing.

2.2. Variables of Bank Financing of SMEs

The universe of SMEs is very heterogeneous, and financial obstacles vary greatly depending on the internal characteristics of the enterprises, such as the size, age, location, the growth projections of the enterprise, or the economic sector. The characteristics of the main business owner, such as their gender or business experience, also influence access to financing (OECD 2018). For these reasons, this section highlights some of the variables most researched in previous empirical studies.

2.2.1. Economic Sector

The economic sector to which SMEs belong influences their capital-structure decisions and access to external financing (Mac an Bhaird and Lucey 2014; Yazdanfar and Öhman 2016).

Various empirical studies have shown that SMEs in the service sector have greater restrictions to access external financing (Guercio et al. 2017). In the same sense, Michaelas et al. (1999) indicate that the industry influences the total level of debt in small enterprises, as well as the maturity structure of the debt. SMEs in the service sector face more financial constraints compared to manufacturing SMEs; this may be due to the difficulty for lenders to assess intangible assets compared to tangible assets (Cressy and Olofsson 1997).

Briozzo and Vigier (2014) indicate that enterprises in the manufacturing sector have more assets that can serve as collateral for a loan. This factor reduces information asymmetries between the enterprise and the lenders, so these enterprises have greater probability of access to credit. Baker et al. (2020) agrees that SMEs in the manufacturing sector with tangible assets are more likely to obtain external financing than enterprises in the service sector with fewer tangible assets. In addition, manufacturing SMEs use long-term financing and other sources of financing, while service SMEs use short-term financing.

Andrieu et al. (2018) found that SMEs that belong to the manufacturing sector have a higher probability of accessing bank loans and commercial credit than those that do not belong to this sector.

2.2.2. Size of the Enterprise

The size of the enterprise indicates that the more developed or expanded an enterprise is, the more likely it will be able to generate sufficient resources to repay the loan. Likewise, larger enterprises have a greater capacity to acquire more assets as collateral for the loans obtained, which is why it has been shown to have a positive relationship with the possibility of accessing a loan (Botello 2015).

Beck and Demirgüc-Kunt (2006) indicate that, in countries with fixed transaction costs and information asymmetries, small enterprises that demand smaller loans face higher transaction costs and higher risk premiums because they are generally more opaque and they have fewer guarantees to offer. This is reflected in financing patterns: small enterprises finance less of their investment and working capital with bank financing compared to large enterprises. By contrast, smaller enterprises finance a greater share of the investment with informal sources, such as moneylenders, family, and friends.

Mac an Bhaird and Lucey (2010) found that the larger the enterprise, the greater the probability of accessing external financing. In addition, Petersen and Rajan (1994) and Hutchinson (2004) identified that the size of the enterprise is positively related to the indebtedness of the enterprises. In the same sense, Rao et al. (2018) agree that the size of the enterprises is positively related to indebtedness because larger enterprises have more access to external financing sources and the cost of acquiring credit is lower for larger enterprises than for small enterprises. The debt of small enterprises is proportionally less than that issued by larger enterprises due to some factors such as: higher bankruptcy costs, higher agency costs, and higher costs of monitoring information asymmetries, among others (Michaelas et al. 1999).

Kumar and Rao (2016) mention that larger enterprises have alternative resources, such as financial institutions and other nonbank lenders. Furthermore, older enterprises are more stable and well-known in the market, which is why they have greater solvency.

According to the theory of the pecking order and the financial-growth cycle, it is expected that the larger the enterprise is, the more it is correlated with lower information asymmetries; therefore, it positively influences access to credit (Briozzo and Vigier 2014).

Guercio et al. (2020) found a significant relationship between the size and the use of different financing sources; the smaller the enterprises, the greater the probability of using only internal financing sources and the lower the probability of using a diversified financing portfolio. In contrast, when enterprises are larger and older, they use a more diversified financing structure.

2.2.3. Age of the Enterprise

The age of the enterprise is a controversial variable. On the one hand, Petersen and Rajan (1994) identified a negative relationship between the seniority of SMEs and access to bank financing. On the other hand, Gregory et al. (2005) and Bougheas et al. (2006) indicate that there is a positive relationship.

In the same vein, Yazdanfar and Öhman (2016) point out that the results on the relationship between the enterprise age and debt are contradictory. On the one hand, enterprises can improve their competitiveness and reputation over time, which increases

the probability of access to credit for older enterprises. On the other hand, enterprises can increase retained earnings over time, making older enterprises more likely to use them as a source of internal financing and to require less external financing.

Rao et al. (2018) indicate that the age of the enterprise is positively related to financing. Older enterprises are more likely to obtain credit, while newer enterprises depend mainly on their internal sources of financing because they do not request external financing due to their low credibility in the credit market.

Serrasqueiro and Nunes (2012) indicate that the age of the enterprise is an influential factor that affects access to external financing; young SMEs on average had a higher short-term debt than older SMEs. On the other hand, young SMEs on average had lower long-term debt than older enterprises.

In this sense, Forte et al. (2013) point out that the age of the enterprise is negatively related to financial leverage, which suggests that older SMEs may be more conservative in their financing decisions. On the other hand, Andrieu et al. (2018) mention that young enterprises have more problems due to information asymmetries because they have a less successful credit history than older enterprises.

Mac an Bhaird and Lucey (2010) point out that older SMEs are less dependent on external financing because, as they age, they tend to use retained earnings more and more as internal financing. In the same vein, Hall et al. (2004) indicate that the older an enterprise is, the more it will be able to accumulate more funds and will need less financing. In other words, a young enterprise will not have had time to accumulate funds and will be forced to apply for credit. Therefore, age is negatively related to financing in both the short and long term.

On the other hand, it has been shown that younger SMEs use more internal financing instead of bank loans; in contrast, as the age of the firm increases, the proportion of bank loans gradually increases and informal financing decreases (Nizaeva and Coskun 2019). Now, it is likely that the financial cycles of enterprises and the life cycles of owners are connected, sometimes with opposite effects. For example, information asymmetries reduce with the increasing age of enterprises, resulting in greater access to external financing, while risk aversion and the cost of personal bankruptcy increase with the age of the entrepreneur, which implies a lower desire for debt (Briozzo and Vigier 2014).

Younger SMEs have less experience and a lower track record of success than older enterprises, which makes it difficult for them to obtain bank credit (Bougheas et al. 2006; Andrieu et al. 2018). Consolidated enterprises in a market with solid productive structures offer banking institutions sufficient guarantees to cover bank loans in the future, so the older the enterprises, the greater the probability of access to bank financing (Botello 2015).

Berger and Udell (1998), with a focus on the financial life cycle, infer that enterprises tend to depend more and more on bank credit during their early stages of life, but that they use less bank credit as they get older. La Rocca et al. (2011) infer that small enterprises in Italy have high levels of debt early in their life cycle, but this debt ratio declines in later life cycle stages as firms accumulate retained earnings that they will use as a source of financing.

2.2.4. Foreign Participation and Export Capacity

Foreign ownership is a variable that influences the search for financing because foreign parent enterprises, which are likely to be large enterprises, may be the main source of financing for subsidiaries, reducing the need for external financing (Xiang et al. 2015). Foreign-owned or multinational enterprises are expected to face fewer financial obstacles because they have easier access to international sources of external financing (Beck et al. 2006).

On the other hand, Pasquini and De Giovanni (2010) showed that enterprises are more likely to access external financing if they export part or all their sales. Baker et al. (2020) mention that Indian SMEs that have export activity are influenced in the use of their financing sources.

2.2.5. Legal Status

According to Guercio et al. (2020), an enterprise incorporated with a legal form that limits patrimonial responsibility, such as corporations or limited liability enterprises, influences access to credit because they are more transparent, in relation to those enterprises that do not limit patrimonial responsibility.

Briozzo et al. (2016b) identified that enterprises with limited liability use long-term credits more frequently than those enterprises that do not have this legal form; this result also presents significant differences and coincides with the compensation theory. In addition, they infer that banks consider limited liability as a positive factor that indicates credibility, formality of operations, and represents signs of potential growth. Therefore, they identify a positive relationship between limited liability and access to bank credit.

In the same vein, Baker et al. (2020) point out that limited liability enterprises have a greater preference for all kinds of financing sources than sole proprietorships. Briozzo and Vigier (2014), in their research, indicate that enterprises that are constituted as limited liability enterprises are expected to have more attractive bank credit opportunities. On the other hand, Demirgüç-Kunt et al. (2006) found that enterprises report fewer financial obstacles to their growth than unincorporated enterprises, and this advantage is greater in countries with more developed institutions and favorable business environments.

Smaller enterprises are often managed by family members or a single owner, and operate without knowledge of the enterprise's capital structure. Therefore, financing is based on internal sources (Wellalage and Locke 2015).

On the other hand, due to the costs related to agency conflicts, SME owners or managers choose to be autonomous and maintain control of their enterprises. Therefore, they follow a hierarchical order in capital-structure decisions, preferring internal sources over external sources of financing (Yazdanfar and Öhman 2016).

2.2.6. Entrepreneur Attributes

In general, enterprises with managers with little experience and a low level of education are more likely to have restrictions on accessing external financing (Cowling et al. 2016). Baker et al. (2020) mention that older managers or owners resort to more formal debt (short-term and long-term financing) than their younger counterparts. Also, owners with significant work experience use more short-term financing or other forms of financing than those with little experience.

On the other hand, managers or owners who are more risk averse are often reluctant to use adequate levels of financing in their SMEs because they have invested a large portion of their personal assets in the company (Wellalage and Locke 2015).

Various studies emphasize that women-owned enterprises face more difficulties in accessing business credit (Chaudhuri et al. 2020). Also, enterprises managed by women are less likely to access credit and have to pay higher interest rates (Muravyev et al. 2009; Presbitero et al. 2014).

According to Baker et al. (2020), male managers or owners choose to use internal financing sources, as well as credits; however, women use other forms of financing more, such as commercial credits, moneylender resources, loans from relatives and friends, as well as funds from other enterprises. However, in other studies carried out to analyze the effect of gender on access to formal financing, they did not identify evidence of gender discrimination in obtaining credit (Aterido et al. 2013; Bardasi et al. 2011).

2.3. Empirical Studies on the Determinants of Bank Financing

This section presents, in chronological order, the 17 most significant empirical studies on the limitants of the bank financing of SMEs developed in the two most recent decades internationally. The main results of these studies are described below:

Michaelas et al. (1999) indicate that the most relevant determinants of the debt level of SMEs are the size, age, profitability, growth, operational risk, asset structure, and share rotation. Likewise, they infer that the pecking-order theory is relevant for small

enterprises, since the costs of external capital for these enterprises are higher than for large enterprises. They also indicate that small enterprises avoid the use of external financing and depend more on retained earnings and bank financing to maintain control of the enterprise. Furthermore, they point out that long-term average debt ratios exhibit a positive relationship with changes in the enterprise's economic growth.

Beck et al. (2005) indicate that smaller enterprises are negatively and significantly affected in their growth by the limitations in accessing financing for leasing equipment and exports. Likewise, manufacturing enterprises face more obstacles when financing themselves. In addition, enterprises that have many competitors also have more obstacles to accessing financing. In general, the size of the enterprise is the variable that determines how great the financial obstacles will be.

Gregory et al. (2005) conclude that only the size of the enterprise turned out to be a significant variable for making decisions about financing. Likewise, the results partially support the approach of the financial growth-cycle model, indicating that larger enterprises, measured by the number of employees, are more likely to seek external and long-term sources of financing.

Beck et al. (2006) found that the age, size, and type of ownership mostly influence the presence of financial obstacles, with older, larger, and foreign-owned enterprises reporting fewer financial obstacles. Furthermore, they discovered that, in countries with higher levels of development of financial intermediaries, better stock markets, more efficient legal systems, and a higher GDP per capita, enterprises presented fewer financial constraints.

López-Gracia and Sogorb-Mira (2008) indicate that the size of the enterprise is positively and significantly related to the level of debt. According to the trade-off theory, enterprise size tends to balance the bankruptcy risk of SMEs when debt increases. Large enterprises often offer greater collateral guarantees and less risk, have a better reputation in financial markets, and can achieve higher levels of financing. Likewise, the age of an enterprise is negatively and significantly related to its level of financing. According to the pecking-order theory, older SMEs can generate and save enough internal resources to not depend on external financing, while younger SMEs cannot generate and retain resources as easily as older enterprises, so they have a greater dependence on debt.

Gómez et al. (2009) indicate that the main limitation to obtaining a bank loan is the interest rates, followed by the excess of procedures or the enormous amount of information required, and in third place are the guarantees required by the banks. Likewise, mature (more than ten years) and medium-term enterprises are more likely to be approved for loans.

Pasquini and De Giovanni (2010) highlight that larger enterprises are more likely to obtain bank credit and, therefore, are the ones who request it the most. On the other hand, although SMEs need external financing and have profitable investment projects, almost 37% exclude themselves from bank loans, and this partly reflects their low probability of obtaining loans. Likewise, enterprises that are exporters are evaluated favorably by banks, which demonstrates a positive correlation with the probability of obtaining a bank loan.

Cowling et al. (2012) indicate that the size of the enterprise is the variable that has the greatest influence on access to bank credit, which is why microenterprises are limited when obtaining financing. Likewise, larger enterprises and those that had sales declines were more likely to increase their demand for bank loans. Furthermore, they indicate that enterprises run by women presented a low demand for external financing. It was also observed that highly experienced owners had a greater demand for external financing before the recession, but during the recession, they had similar levels of demand as less-experienced owners.

Botello (2015) found that size and technological capacity are the variables that most influence whether an enterprise can access financing. These factors help the enterprise to generate competitive advantages in the market and with this ensure the creation of sustainable cash flows, aspects that banks consider as the best guarantee to grant them loans.

Xiang et al. (2015) indicate that the size of the enterprise has a significant and positive effect on the search for financing, which means that the larger the enterprise, the more likely it is to request external financing. Likewise, SMEs with some degree of foreign ownership are less likely to apply for external financing. Furthermore, they point out that the lack of success in obtaining financing in the past continues to have a significant and cumulative impact on financing-seeking behavior in the future.

Briozzo et al. (2016a) infer that enterprise characteristics related to information asymmetries, such as the age, size, and legal constitution of the enterprise, as well as owner factors, such as the education and age of the owner, are variables that significantly influence financing decisions. Likewise, increasing the age of the owner increases the probability that the enterprise follows the hierarchical order theory and is positively related to debt aversion. Regarding enterprise characteristics, age has an inverse relationship with the pecking-order theory.

Cowling et al. (2016) indicate that older enterprises that have a higher risk rating, as well as a history of credit delinquency, are those that are more likely to demand credit, which is the opposite result to women-owned enterprises. In addition, the age of the enterprise is an important variable because banks consider it less risky to grant credit to older enterprises.

Yazdanfar and Öhman (2016) indicate that there is a significant negative relationship between the age of the enterprise and debt. Older enterprises tend to be less reliant on debt than younger ones; this may be because older enterprises are more likely to use internal financing sources than younger SMEs. Likewise, different behaviors are suggested depending on the age of the enterprise and the use of short- or long-term debt. Younger SMEs have higher short-term debt levels than older SMEs, while older SMEs have higher long-term debt levels than younger SMEs.

Andrieu et al. (2018) found that older and larger SMEs are more likely to access bank loans than younger and smaller SMEs. In particular, the impact of the age of the enterprise is significant and positive for SMEs that have been at least six years old. In terms of enterprise size, enterprises with at least ten employees have a significantly higher probability of obtaining bank financing than microenterprises. Likewise, SMEs that belong to the manufacturing sector have a higher probability of accessing bank financing than those that do not belong to this sector.

Rao et al. (2018) demonstrated that older SMEs have high solvency in the financial market, a good reputation, and a greater transparency of information with lenders, so there is a positive relationship with debt. Likewise, the size of the enterprise is negatively related to external financing, because larger enterprises have constant profits, which is why they consider credit as a more expensive option.

Nizaeva and Coskun (2019) demonstrated that SMEs belonging to the commercial sector have fewer financial restrictions than enterprises in the service and manufacturing sectors. Likewise, they indicated that financial obstacles increased as the enterprises were older, a result contrary to most previous studies but in line with recent empirical studies from southeastern Europe.

Chaudhuri et al. (2020) identified that men-owned enterprises are around 10 to 12% more likely to obtain formal credit compared to women-owned enterprises. Likewise, they conclude that women-owned enterprises are at a disadvantage due to gender discrimination in the credit market.

Table A1 in the Appendix A presents a summary indicating the sample (country, size, and period) of the study, the variables of interest related to this research, the methodology, and the main results. These empirical studies were used as a reference to determine the objectives and hypotheses, as well as to contrast against the results of this research.

Despite the great diversity of empirical studies, the only one that was identified in the context of SMEs in Mexico was the study by Gómez et al. (2009), whose objective was to identify the restrictions in the approval of a bank loan; it focused on the ambit of credit supply. In addition, its sample was limited to 128 SMEs in the manufacturing sector

of Puebla, Mexico between 2007 and 2008. In contrast, our research focuses on the field of credit demand with a sample of 1480 representative enterprises by enterprise size, by region, and by the economic sector of Mexico.

2.4. Research Hypothesis

Based on the literature review and the objectives of this research, the central hypothesis was affirmed, in the sense that the economic sector, the enterprise size, the characteristics inherent to the enterprise, the legal status, the variables linked to the performance of the enterprise, and the attributes of the owner significantly influence the access to the bank financing of SMEs in Mexico. In this sense, the operational hypotheses were:

- H_1. Economic sector. Enterprises in the manufacturing sector are more likely to access bank loans than those in other sectors. In contrast, those in the service sectors are less likely to have access to bank financing than those in other sectors.
- H_2. Enterprise size. The larger the enterprise, the greater the access to bank financing. Small enterprises are less likely to access bank loans.
- H_3. Enterprise age. The older the enterprises, the greater the access to bank financing. Older enterprises are more likely to access bank loans.
- H_4. Foreign participation. Foreign-owned enterprises are less likely to use bank credit.
- H_5. Legal status. Enterprises legally incorporated as societies or associations are more likely to access bank loans than enterprises that have a sole owner.
- H_6. Exporter. Exporting enterprises are more likely to use bank loans.
- H_7. Checking/saving account. Enterprises that have a checking or savings account are more likely to access bank financing.
- H_8. Annual sales. The higher the annual sales of the enterprises, the greater the access to bank credits.
- H_9. Permanent employees. The more full-time permanent employees an enterprise has, the greater the probability of accessing bank financing.
- H_{10}. Manager female. Enterprises in which the general manager is a woman are less likely to access bank loans.
- H_{11}. Manager experience. Enterprises in which the general manager has more experience are more likely to use bank financing.

3. Data and Methodology

3.1. Sample and Data

The target population it was made up of enterprises with five or more employees in the manufacturing, commerce, and service sectors, located in the eight regions of Mexico with the greatest economic activity. The sample was selected through stratified random sampling. The final sample was 1480 enterprises, sufficiently large, and representative by enterprise size (small, medium, and large), by economic sector (manufacturing, commerce, and services), and by geographic region (World Bank 2011).

3.2. Variables

The variables were defined conceptually in accordance with the provisions of the items of the main module of the Enterprise Surveys of Mexico 2010 (World Bank 2010). The operational definitions contribute to establishing the way in which the research variables will be measured; see details in Table A2 in Appendix A.

3.3. Research Design

Using a discrete-response probit regression model, the degree of impact that the independent or explanatory variables have on the probability of obtaining a bank loan was determined, so the study has a quantitative approach with a correlational scope. Likewise, the research design is nonexperimental and cross-sectional (Hernández-Sampieri and Mendoza 2018).

4. Empirical Results

4.1. Characterization of the Sample and Descriptive Statistics

Table 1 shows the integration of the sample of surveyed enterprises. Likewise, the description of the binary independent variables with respect to the dependent variable is presented. In general, only 48.3% of the enterprises surveyed indicated that they had a bank loan. From these data, some a priori significant differences can be observed.

Table 1. Binary variables by group of enterprises (with and without bank credit).

	Sample		Bank Credit			
Independent Variable	**Total**	**%**	**No**	**%**	**Yes**	**%**
Manufacturing	1145	77.8%	569	49.7%	576	50.3%
Commerce	144	9.8%	83	57.6%	61	42.4%
Services	182	12.4%	109	59.9%	73	40.1%
	1471	**100%**	**761**	**51.7%**	**710**	**48.3%**
Small	358	24.3%	251	70.1%	107	29.9%
Medium	349	23.7%	182	52.1%	167	47.9%
Large	764	51.9%	328	42.9%	436	57.1%
	1471	**100%**	**761**	**51.7%**	**710**	**48.3%**
Single owner	319	21.7%	209	65.5%	110	34.5%
Society or Association	1151	78.3%	551	47.9%	600	52.1%
	1470	**100%**	**760**	**51.7%**	**710**	**48.3%**
No foreign participation	1324	90.1%	676	51.1%	648	48.9%
With foreign participation	145	9.9%	84	57.9%	61	42.1%
	1469	**100%**	**760**	**51.7%**	**709**	**48.3%**
General manager is not a woman	1310	89.1%	665	50.8%	645	49.2%
General manager is female	160	10.9%	96	60.0%	64	40.0%
	1470	**100%**	**761**	**51.8%**	**709**	**48.2%**
Nonexporter	1160	78.9%	636	54.8%	524	45.2%
Exporter	311	21.1%	125	40.2%	186	59.8%
	1471	**100%**	**761**	**51.7%**	**710**	**48.3%**
No checking/savings account	506	34.5%	299	59.1%	207	40.9%
With checking/savings account	961	65.5%	460	47.9%	501	52.1%
	1467	**100%**	**759**	**51.7%**	**708**	**48.3%**

Source: Own elaboration based on data analysis.

Table 2 shows the relationship of the quantitative independent variables with respect to having a credit or bank loan. For example, the average age of the enterprises that have a bank loan is 25.9 years (higher than the average of the sample, which is 24), while those that do not have one is 22.2 years.

Table 3 presents the summary of the basic descriptive statistical analyses of each one of the independent variables.

4.2. Correlations

Table A3 in Appendix A presents the correlation matrix to determine the relationship or dependency that exists between the independent variables of the research. The results of these correlations are consistent with the context of the growth of Mexican enterprises, measured through their annual sales and permanent employees, as well as their legal status. A larger share of small enterprises is managed by a single owner, with low annual sales and few employees, compared to large enterprises. In fact, the last two criteria (annual sales and employees) are used in Mexico to classify enterprises by size.

Table 2. Quantitative variables by group of enterprises (with and without bank credit).

		Bank Credit	
Independent Variable	**Sample Average**	**No**	**Yes**
Enterprise age (average years)	24.0	22.2	25.9
Manager experience (average years)	23.0	22.3	23.8
Permanent employees (average number)	216.2	170.0	267.8
Annual sales Quantile 1 (%)		72.4%	27.6%
Quantile 2 (%)		49.4%	50.6%
Quantile 3 (%)		43.2%	56.8%
Quantile 4 (%)		41.3%	58.7%

Source: Own elaboration based on data analysis.

Table 3. Summary of basic descriptive statistics of the variables.

Variable	Obs.	Minimum	Maximum	Mean	Standard Deviation
Manufacturing	1480	0	1	0.7784	0.4155
Commerce	1480	0	1	0.0986	0.2983
Services	1480	0	1	0.1230	0.3285
Small	1480	0	1	0.2446	0.4300
Medium	1480	0	1	0.2372	0.4255
Larger	1480	0	1	0.5182	0.4998
Single owner	1478	0	1	0.2185	0.4134
Society or association	1478	0	1	0.7815	0.4134
Foreign participation	1478	0	1	0.0981	0.2976
Manager is female	1479	0	1	0.1089	0.3116
Exporter	1480	0	1	0.2115	0.4085
Checking/saving account	1475	0	1	0.6549	0.4756
Enterprise age (Log) *	1470	0.0000	5.3083	2.8686	0.8593
Manager experience (Log) *	1467	0.0000	4.1744	2.9697	0.6430
Annual sales (Log) *	1396	10.5970	27.6310	16.7550	2.3187
Permanent employees (Log) *	1479	0.6932	9.9968	3.8116	1.5840

Note *: The four quantitative independent variables are presented in their logarithm of the real value, as mentioned in the operational definition of the variables. **Source:** Own elaboration based on the data analysis carried out in SPSS.

4.3. Multivariate Analysis: Probit Regression Model

To determine which enterprise characteristics explain whether or not it has a bank loan, we perform a multivariate analysis using a probit regression model. The proposed model is a binary probit, which is used when the dependent variable is dichotomous, which is why it is considered a binary- or discrete-response model, and its main objective is to determine the response probability (Wooldridge 2010). Therefore, the following equation of the probit model is proposed to determine the probability that an enterprise will access a bank loan:

$$\begin{aligned} Y = \alpha + \beta 1 \times \text{Manufacturing} + \beta 2 \times \text{Commerce} + \beta 3 \times \text{Services} + \beta 4 \times \text{Small} + \beta 5 \times \text{Medium} + \beta 6 \times \text{Large} + \\ \beta 7 \times \text{Age} + \beta 8 \times \text{Foreign} + \beta 9 \times \text{Single owner} + \beta 10 \times \text{Society or association} + \beta 11 \times \text{Exporter} + \\ \beta 12 \times \text{Checking/saving account} + \beta 13 \times \text{Annual Sales} + \beta 14 \times \text{Permanent employees} + \\ \beta 15 \times \text{Manager female} + \beta 16 \times \text{Manager experience} + \varepsilon i \end{aligned} \quad (1)$$

where Y = Bank credit is the explained or binary-dependent variable, which takes the value of 1 (one) if the enterprise has a bank credit and 0 (zero) otherwise. The explanatory variables that can potentially be incorporated into the model represent various specific characteristics (defined in Table A2 in Appendix A) of the enterprise that determine access to bank credit.

Tests were carried out with different variables alternatively, starting from the broadest model that included all the potentially explanatory variables, until reaching other more

restricted models that included only the significant variables according to estimated models or previous empirical studies. Based on various combinations, more than 60 models were determined. Table A4 in the Appendix A presents the summary of the main results of the 10 models that were considered most relevant. According to the regression models, the variables that are considered the most significant determinants or predictors for obtaining a bank loan are: the manufacturing sector, the service sector, small size, the age of the enterprise, foreign participation, checking–savings account, and annual sales.

Belonging to the manufacturing sector is a robust predictor; in most models, it has a significance of 99%, and the coefficients have a probability greater than 22%, with a positive effect. On the other hand, the services variable has a significance of 99% in most of the models, and its coefficients have a probability greater than 26%, with a negative effect. For example, in the M1 model, an enterprise that operates in the manufacturing sector has a 23.42% higher probability of accessing a bank loan than an enterprise that does not belong to said sector; while in the M2 model, a service sector enterprise is 26.26% less likely to obtain a loan than its counterparts. The small size variable is one of the most robust predictors; a small enterprise has between 30.08% and 40.51% less probability of accessing a bank loan than its counterparts, and in all models, it has a significance of 99%.

The age of the enterprise is one of the most solid predictors of bank credit; in most models, it has a significance of 95%, and all its coefficients resulted with the expected positive effect. Foreign participation is one of the most robust determinants; in all models it has a significance of 99%, and with estimated probabilities greater than 49%, with a negative effect. Holding a checking or savings account is considered another determinant, although not as robust because it only has a significance of 90%, and with estimated probabilities greater than 13.97%, with a positive effect. Annual sales is a variable with mixed results; in some models, it has a significance of 99%, while in others it is 90%, and in the models M1, M4, and M6, it is not significant. However, it is considered a determinant of bank financing because its estimated probabilities were greater than 44%, and with the expected positive sign. Regarding the other variables, they are not considered determinants of access to bank loans because they were not significant in the regression models in which they were included.

Regarding the goodness-of-fit measures of the models, McFadden's R2 is low; however, these models are considered to have acceptable predictive power because the percentage of correct predictions in relation to the total number of observations is greater than 61% in all models, so all are classified as if they were 1. Likewise, in models with a discrete response, what is important is that the expected signs of the regression coefficients are in harmony with other studies and coincide in practice with the business context (Gujarati and Porter 2010).

4.4. Profiles Analysis

Subsequently, the three most relevant models (M1, M2, and M3) were selected to determine the various profiles with their estimated probability that an enterprise has a bank loan based on the independent variables that were significant in each model. For reasons of space, only the profiles of the M1 model are shown in Figure A1 in Appendix A.

In determining the estimated probability of profile 1 of each model, the significant variables were considered with a reference value. In the binary variables, the value of 1 (one) was taken, which indicates that they do have said characteristic; in the age variable, the average in years of the sample was taken; in annual sales, the upper value of the quantile 1 was taken. In the probabilities of the other profiles (profile 2 to profile X), the values of the significant variables of profile 1 are maintained, and only the value of the variable of interest wanting to be changed is modified in each profile; in the case of binary variables, it was changed with a value of 0 (zero), which indicates that they do not have said characteristic; in the age variable, it was changed to other values progressively; in annual sales, it was changed by the value of quantiles 2, 3, and 4. The estimated probabilities of

each profile are compared by a difference with the probability of profile 1 to determine the importance of each variable.

According to profile 1 of the M1 model, a small enterprise that belongs to the manufacturing sector, with 24 years of life (average of the sample), with foreign participation, and with a bank account, has a 51.58% probability of having a bank credit. Starting from profile 1 of each model, other alternate profiles were created to analyze the influence of each independent variable on access to bank financing.

In the profiles of the M1 model in Figure A1 in the Appendix A, age is shown as the determinant with the greatest impact on access to bank financing. According to profile 1, the probability that a 24-year-old enterprise has a bank loan is 51.58%, while, when changed to one year (profile 4), it only has a probability of 3.21%; that is, 48.36% less of a probability. As the age increases, the probability of having a bank loan gradually increases. The second-most-relevant variable is foreign participation; the probability of having a bank loan in profile 1 is 51.58%, while an enterprise that does not have one (profile 9) is 71.35%; that is, a 19.77% greater probability. The third and fourth variables with the greatest influence are small size and manufacturing, respectively.

5. Discussion and Conclusions

5.1. Contributions of the Research

Based on the predictive power acceptable of the estimated binary probit regression models, the operational hypotheses were contrasted, for which the following conclusions are established:

- H_1. Economic sector. It is confirmed that enterprises in the manufacturing sector are more likely to access bank loans than enterprises in other economic sectors, while those in the service sector are the least likely to have access to bank financing. In the same way, it is confirmed that the commerce variable does not have a significant relationship with the dependent variable, as had been proposed in the hypothesis.
- H_2. Enterprise size. It was confirmed that small enterprises are less likely to access bank loans. Regarding the large variable, the hypothesis that the larger the companies, the greater the access to bank financing is rejected. On the other hand, it is confirmed that the medium enterprise variable does not have a significant relationship with the dependent variable.
- H_3. Enterprise age. It is confirmed that older enterprises are more likely to access bank financing. The age of the enterprise is the most robust predictor of bank credit; according to the profile analysis, as the age of the enterprise increases, the probability of acquiring a bank loan increases progressively.
- H_4. Foreign participation. It confirms that foreign-owned enterprises are less likely to obtain bank financing because foreign parent enterprises are the main source of financing for their subsidiaries.
- H_5. Legal status. This hypothesis is partially confirmed. On the one hand, it is rejected that enterprises legally constituted as societies or associations are more likely to use bank financing than enterprises that have a sole owner, because it did not result significantly in any of the regression models in which this variable was included. On the other hand, it is confirmed that the single-owner variable does not have a significant influence on access to bank credit.
- H_6. Exporter. The hypothesis that there is a positive relationship between exporting enterprises and the probability of using bank loans is rejected, as it was only 90% significant in models M2 and M8; however, in all other models, it was not significant.
- H_7. Checking/saving account. It is confirmed that enterprises that have a checking or savings account are more likely to acquire bank loans than enterprises that do not have such an account.
- H_8. Annual sales. It is confirmed that enterprises with higher annual sales are more likely to use bank financing.

- Hypothesis H_9, H_{10}, and H_{11}. The hypotheses H_9, H_{10}, and H_{11} are rejected; the regression models indicate that there is no significant relationship between the independent variables (permanent employees, female manager, and the experience of the general manager) with the dependent variable, so they are not considered determinants of the access to bank financing.

In summary, based on the profile analysis, it was concluded that the enterprise age is the determinant with the greatest impact on the probability of having a bank loan; it is followed by other predictors, such as foreign participation, small size, and the manufacturing sector. Annual sales also have an influence on the dependent variable. However, it is recommended to treat this result with reserve in future research because, in the regression models, it had mixed results; in some models, it has a significance of 99%, while in others, it was 90%, and in others it was not significant. Therefore, it is not considered a robust determinant of bank financing.

Based on the conclusions of the previous results, Table 4 presents a summary of the comparison of the hypotheses (expected effect) with the empirical results (real effect) on the probability of accessing bank loans. Likewise, both the empirical studies that coincide with the results and those that do not coincide are shown.

Table 4. Summary of hypotheses and empirical results on access to bank credit.

Variables	Hypothesis	Expected Effect	Real Effect	Empirical Studies Coincident with Results	Empirical Studies Not Coincident with Results
Economic sector					
Manufacturing	**H_1**	Positive	Positive	(Beck et al. 2006) (Botello 2015) (Briozzo et al. 2016a) (Andrieu et al. 2018)	
Commerce	**H_1**	NS	NS	(Xiang et al. 2015) (Cowling et al. 2016)	Positive effect: (Nizaeva and Coskun 2019)
Services	**H_1**	Negative	Negative	(Botello 2015)	
Enterprise size					
Small	**H_2**	Negative	Negative	(Michaelas et al. 1999) (Beck et al. 2005) (Beck et al. 2006) (López-Gracia and Sogorb-Mira 2008) (Gómez et al. 2009) (Pasquini and De Giovanni 2010) (Botello 2015) (Xiang et al. 2015) (Briozzo et al. 2016a) (Cowling et al. 2016) (Yazdanfar and Öhman 2016) (Andrieu et al. 2018) (Rao et al. 2018)	
Medium	**H_2**	NS	NS	(Nizaeva and Coskun 2019)	Positive effect: (Gómez et al. 2009)
Large	**H_2**	Positive	NS	(Nizaeva and Coskun 2019)	Positive effect: (Beck et al. 2005) (Beck et al. 2006)

Table 4. *Cont.*

Variables	Hypothesis	Expected Effect	Real Effect	Empirical Studies Coincident with Results	Empirical Studies Not Coincident with Results
Characteristics inherent to the enterprise					
Age	H_3	Positive	Positive	(Beck et al. 2006) (Botello 2015) (Briozzo et al. 2016a) (Cowling et al. 2016) (Yazdanfar and Öhman 2016) (Andrieu et al. 2018) (Rao et al. 2018)	Negative effect: (Michaelas et al. 1999) (López-Gracia and Sogorb-Mira 2008) (Nizaeva and Coskun 2019)
Foreign participation	H_4	Negative	Negative	(Beck et al. 2006) (Xiang et al. 2015)	
Legal status of the enterprise					
Single owner	H_5	NS	NS	(Andrieu et al. 2018)	
Society or association	H_5	Positive	NS	No matching study	Positive effect: (Briozzo et al. 2016a)
Linked to enterprise performance					
Exporter	H_6	Positive	NS	(Cowling et al. 2012) (Cowling et al. 2016)	Positive effect: (Pasquini and De Giovanni 2010)
Checking/saving account	H_7	Positive	Positive	(Botello 2015) (Chaudhuri et al. 2020)	
Annual sales	H_8	Positive	Positive	(Pasquini and De Giovanni 2010) (Xiang et al. 2015) (Rao et al. 2018)	
Permanent employees	H_9	Positive	NS	No matching study	
Entrepreneur attributes					
Manager is female	H_{10}	Negative	NS	No matching study	Negative effect: (Cowling et al. 2012) (Chaudhuri et al. 2020)
Manager experience	H_{11}	Positive	NS	(Cowling et al. 2012) (Cowling et al. 2016)	

Note: NS = Not significant. In the hypothesis, a significant relationship was not expected and, in the result, a significant relationship between the variables was not obtained. **Source:** Own elaboration based on research.

Based on the probit regression models and the profiles analysis, it is concluded that the age, small size, foreign participation, and manufacturing sector are the most influential determinants in bank financing; this means that younger, smaller, foreign-owned, and nonmanufacturing firms are the least likely to obtain bank credit.

Additionally, it is concluded that the financial hierarchy theory applies to the financing decisions of SMEs because, when they are young, they prefer internal sources of financing that imply lower information costs and less risk, as well as due to their restricted access to external sources. The financial life-cycle theory also applies to SMEs because, when they are young and small, they are less transparent in their information, so they are mainly financed with their own funds. However, as the enterprise grows and becomes older, it gains more experience and the opacity of information decreases, so its financial needs change.

It should be noted that this research is pioneering because, through a discrete-response probit regression model, as well as through profile analysis, the variables with the greatest influence on the probability of obtaining a bank loan were identified. As far as is known, there are no other studies that address this issue with this methodology in Mexico. Due to the above, this research is relevant because it provides findings on the determinants of access to bank financing in SMEs in Mexico that contribute to solving this complex problem.

5.2. Research Recommendations and Limitations

Business financing in Mexico is a challenge that must be addressed urgently. A fundamental challenge is to understand that SMEs have very different structures from large enterprises, and that the sources of financing to capitalize this type of business must be more accessible and with special mechanisms, so it is recommended to implement innovative public policies that favor access to financing under the best conditions for this business sector.

Likewise, it is recommended that the banking system, government, and enterprises implement permanent training campaigns on financial education aimed at owners and managers of SMEs and microenterprises to encourage their participation in the financial sector, as well as to learn about other alternatives for financing that contribute to improving their competitiveness.

One of the limitations of this study is related to the database, which was collected between 2010 and 2011 through the World Bank enterprise survey. However, collecting data through a direct survey was not considered feasible due to insecurity issues and the high costs involved. Likewise, an extensive search of secondary data was carried out, and it was identified that the World Bank business survey was the last one carried out for Mexico, and was also the most appropriate according to the available data and the objectives of this research. Once the World Bank updates the enterprise survey for Mexico, it will be important to replicate this research to collect more recent data and compare the findings with this study.

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Appendix A

Table A1. Synthesis of empirical studies on the determinants of bank financing.

Author, Year	Sample			Variables of Interest Related to the Study	Methodology	Main Results
	Country	Size	Period			
(Michaelas et al. 1999)	United Kingdom	3500 SMEs	1986–1995	Enterprise age Size Cost effectiveness	Panel data analysis	Size, age, profitability, and growth all have an impact on debt levels in small enterprises. Young enterprises are externally financed and have higher debt ratios than older enterprises. The positive relationship between size and total debt indicates that the larger the enterprise, the higher the debt ratio.
(Beck et al. 2005)	54 countries	4000 small, medium, and large enterprises	1995–1999	Exporter enterprise Sector (manufacturing and services) Size	Estimated regression	Larger enterprises face significantly fewer financial hurdles. Manufacturing enterprises face more obstacles in accessing external financing.
(Gregory et al. 2005)	USA	4637 SMEs	1994–1995	Employees Enterprise age Sales	Multinomial logit model	The results partially support the financial growth-cycle model approach. Larger enterprises are more likely to seek long-term, external sources of financing.
(Beck et al. 2006)	80 countries	10,000 small, medium, and large enterprises	1995–1999	Enterprise age Size Sales Economic sector Foreign participation	Probit model	Age, size, and ownership best predict financial obstacles: older, larger, and foreign-owned enterprises reported fewer financial hurdles. Younger enterprises have a higher sensitivity to investment cash flow, which suggests that these enterprises face greater financial constraints.

Table A1. *Cont.*

Author, Year	Sample			Variables of Interest Related to the Study	Methodology	Main Results
	Country	Size	Period			
(López-Gracia and Sogorb-Mira 2008)	Spain	3569 SMEs	1995–2004	Size Enterprise age	Panel data analysis	The size is positively and significantly related to the level of debt; the largest enterprises are the ones that can access more financing. Age is negatively and significantly related to the level of financing; younger SMEs have a greater dependence on debt.
(Gómez et al. 2009)	Mexico	128 SMEs	2007–2008	Enterprise age Small and medium enterprises	Logistic regression by the Wald method	The main limitation to obtain a bank loan is interest rates. Medium-sized enterprises are more likely to obtain bank loans.
(Pasquini and De Giovanni 2010)	Argentina	5536 SMEs	2009	Size Annual sales Enterprise age Exporter enterprise	Heckmann's correction	Larger enterprises are more likely to obtain a bank loan. SMEs are unlikely to obtain bank loans, since a large part exclude themselves. There is a positive correlation between exporting enterprises and the probability of obtaining a bank loan.
(Cowling et al. 2012)	United Kingdom	9362 SMEs	2007–2008	Size Enterprise age Exporter enterprise Owner's gender and experience	Multivariate regression	Microenterprises are more restricted in access to credit because banks use size as the main criterion. The largest enterprises, and those that experienced falls in sales, were more likely to increase their demand for credit. Enterprises managed by women presented low demand for external financing. More experienced owners had a higher demand for outside financing before the recession, but during the recession, they had similar levels of demand as inexperienced owners.

Table A1. *Cont.*

Author, Year	Sample			Variables of Interest Related to the Study	Methodology	Main Results
	Country	Size	Period			
(Botello 2015)	Colombia	85,000 SMEs	2006–2010	Size Enterprise age Economic sector Exporter enterprise Bank account	Logit modelProbit model	The determinants that most influence the probability of access to credit for SMEs are the size and technological capacity of the enterprise. These factors help the enterprise to generate competitive advantages, and with this, ensure sustainable cash flows, which are aspects that banks consider as the best guarantee to grant them credit.
(Xiang et al. 2015)	Australia	2732 SMEs	2005–2007	Economic sector Size Enterprise age Cost effectiveness Foreign participation	Panel data analysis	The size of the enterprise has a significant and positive effect on financing; the larger the enterprise, the more likely it is to request external financing. SMEs with some degree of foreign ownership are less likely to seek external financing.
(Briozzo et al. 2016a)	Argentina	222 SMEs	2006 and 2010	Size Enterprise age Legal status Industrial sector Family enterprise Owner's age and education	Multinomial logit model	Firm characteristics related to information asymmetries, such as age, size, and legal constitution, as well as owner factors, such as education and age, significantly influence financing decisions. Increasing the age of the owner increases the probability that the enterprise will follow the pecking-order theory, and is positively related to debt aversion. The age of the enterprise has an inverse relationship with the pecking-order theory. The results for young and old SMEs also indicate that the pecking-order theory and agency theory should not be considered mutually exclusive.

Table A1. *Cont.*

Author, Year	Sample			Variables of Interest Related to the Study	Methodology	Main Results
	Country	Size	Period			
(Cowling et al. 2016)	United Kingdom	More than 30,000 SMEs	2011–2013	Size Legal status Industrial sector Enterprise age Exporter enterprise Gender, education, and experience of the owner	Probit model	Older enterprises, with a higher risk rating and a history of credit delinquency, are more likely to demand bank loans. Enterprise age is an important variable because banks consider it less risky to extend credit to older enterprises.
(Yazdanfar and Öhman 2016)	Sweden	15,952 SMEs	2009–2012	Enterprise age Size	ANOVA multivariate regressions	There is a significant negative relationship between the age of the enterprise and indebtedness. Older enterprises tend to be less dependent on debt than younger ones The size and sector of SMEs are important variables that influence their capital-structure decisions.
(Andrieu et al. 2018)	12 European countries	72,849 SMEs	2009–2014	Enterprise age Employees Ownership structure Economic sector	Binary probit model	Older and larger SMEs are more likely to obtain bank loans than younger and smaller ones. Firms with ten or more employees are more likely to obtain bank financing than microenterprises. Manufacturing SMEs are more likely to access bank loans than those that do not belong to this sector.
(Rao et al. 2018)	India	174 SMEs	2006–2013	Size Enterprise age Sales	Generalized method of moments	Older SMEs have high solvency in the financial market, so there is a positive relationship with indebtedness, and it makes it easier for them to obtain credit. Firm size is negatively related to external financing, since larger firms have constant profits. The results are more biased towards the pecking-order theory, but compensation theory cannot be excluded.

Table A1. *Cont.*

Author, Year	Sample			Variables of Interest Related to the Study	Methodology	Main Results
	Country	Size	Period			
(Nizaeva and Coskun 2019)	6 countries of Southeast Europe	1520 SMEs	2012–2016	Size Economic sector Enterprise age Foreign participation	Ordered probit Feasible generalized least squares	SMEs belonging to the commercial sector have fewer financial restrictions than enterprises in the service and manufacturing sectors. Financial hurdles increased as firms got older, a result contrary to most previous findings, but in line with recent empirical studies from southeast Europe.
(Chaudhuri et al. 2020)	India	1,155,877 MSMEs	2006–2007	Gender: Woman Single owner Enterprise age Bank account Exporter enterprise	Bivariate probit model	Enterprises managed by women are less likely to access formal credit. Women-owned enterprises are at a disadvantage in the small enterprises credit market, a situation that is related to gender discrimination.

Source: Own elaboration based on the authors cited in the table.

Table A2. Conceptual and operational definitions of the variables.

Item	Variables	Concept Definition	Operational Definition
Dependent variable			
k8	Bank credit	Indicates whether the enterprise has a bank loan from any financial institution.	Binary variable, where 1 indicates whether the enterprise has a bank loan and 0 otherwise.
Economic sector			
a4a	Manufacturing	Includes enterprises that carry out their main activity in the manufacturing sector according to the classification of item a4a.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES belong to this economic sector and 0 that it does NOT belong to this sector.
a4a	Commerce	Includes enterprises that carry out their main activity in the commerce sector according to the classification of item a4a.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES belong to this economic sector and 0 that it does NOT belong to this sector.
a4a	Services	Includes enterprises that carry out their main activity in the service sector according to the classification of item a4a.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES belong to this economic sector and 0 that it does NOT belong to this sector.

Table A2. *Cont.*

Item	Variables	Concept Definition	Operational Definition
Enterprise size			
a6a	Small	A small enterprise is considered if it has between 5 and 19 employees.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES correspond to this size and 0 that it does NOT correspond.
a6a	Medium	A medium enterprise is considered if it has between 20 and 99 employees.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES correspond to this size and 0 that it does NOT correspond.
a6a	Large	A large enterprise is considered if it has 100 or more employees.	It was recoded to a dummy variable, where 1 indicates that the enterprise DOES correspond to this size and 0 that it does NOT correspond.
Characteristics inherent to the enterprise			
b5	Age	It represents the number of years between the start of operations of the enterprise and the year in which the survey was applied.	Quantitative variable. Logarithm of the enterprise age in number of years.
b2b	Foreign participation	It means that private foreign persons, enterprises, or organizations have an ownership interest in the enterprise.	It was recoded to a dummy variable, where 1 indicates that the enterprise has a % of foreign ownership and 0 otherwise.
Legal status of the enterprise			
b1	Single owner	Represents the legal status of the enterprise when it has a sole owner.	It was recoded to a dummy variable, where 1 indicates that the enterprise has a sole owner and 0 otherwise.
b1	Society or association	It represents the legal status of the enterprise when it is legally constituted as a society or association of any type.	It was recoded to a dummy variable, where 1 indicates that the enterprise is legally constituted as a society or association of any type and 0 otherwise.
Linked to enterprise performance			
d3c	Exporter	It means that the enterprise makes direct exports of a percentage or the total of its sales.	It was recoded to a dummy variable, where 1 indicates that the enterprise directly exports part or all its sales and 0 otherwise.
k6	Checking/saving account	Indicates whether the enterprise has a checking or savings bank account at the time of the survey.	Binary variable, where 1 indicates whether the enterprise has a checking or savings bank account and 0 otherwise.
d2	Annual sales	Total annual sales in pesos of the last fiscal year of the enterprise.	Quantitative variable. Logarithm of the total annual sales in pesos of the last fiscal year of the enterprise.
l1	Permanent employees	Full-time permanent employees of the enterprise at the end last fiscal year.	Quantitative variable. Logarithm of the total number of permanent full-time employees in the last fiscal year of the enterprise.

Table A2. *Cont.*

Item	Variables	Concept Definition	Operational Definition
Entrepreneur attributes			
b7a	Manager is female	Indicates when the general manager of the enterprise is a woman.	Binary variable, where 1 indicates if the general manager of the enterprise is a woman and 0 otherwise.
b7	Manager experience	It represents the number of years of experience of the general manager working in the sector.	Quantitative variable. Logarithm of the number of years of experience of the general manager working in the sector.

Source: Own elaboration based on research.

Table A3. Independent variables correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Manufacturing	1.000															
2. Commerce	−0.620 **	1.000														
3. Services	−0.702 **	−0.124 **	1.000													
4. Small	0.008	0.012	−0.022	1.000												
5. Medium	0.045	−0.041	−0.020	−0.317 **	1.000											
6. Large	−0.046	0.024	0.036	−0.590 **	−0.578 **	1.000										
7. Single owner	0.034	−0.027	−0.019	0.444 **	0.040	−0.415 **	1.000									
8. Society or association	−0.034	0.027	0.019	−0.444 **	−0.040	0.415 **	−1.00 **	1.000								
9. Foreign participation	0.017	0.021	−0.041	−0.151 **	−0.119 **	0.231 **	−0.158 **	0.158 **	1.000							
10. Manager is female	−0.007	0.009	0.001	0.104 **	0.055 *	−0.136 **	0.109 **	−0.109 **	−0.050	1.000						
11. Exporter	0.177 **	−0.121 **	−0.113 **	−0.229 **	−0.153 **	0.327 **	−0.206 **	0.206 **	0.291 **	−0.064 *	1.000					
12. Checking/saving account	−0.011	0.016	−0.001	−0.115 **	−0.051	0.143 **	−0.142 **	0.142 **	0.067 *	0.015	0.091 **	1.000				
13. Enterprise age	0.121 **	−0.038	−0.118 **	−0.198 **	−0.072 **	0.231 **	−0.146 **	0.146 **	0.048	−0.036	0.159 **	0.091 **	1.000			
14. Manager experience	0.109 **	−0.075 **	−0.069 **	−0.056 *	−0.060 *	0.099 **	−0.057 *	0.057 *	−0.043	−0.082 **	0.040	0.031	0.396 **	1.000		
15. Annual sales	−0.053 *	0.084 **	−0.009	−0.616 **	−0.210 **	0.709 **	−0.498 **	0.498 **	0.300 **	−0.184 **	0.386 **	0.205 **	0.308 **	0.111 **	1.000	
16. Permanent employees	−0.012	0.034	−0.016	−0.649 **	−0.226 **	0.750 **	−0.485 **	0.485 **	0.264 **	−0.174 **	0.387 **	0.180 **	0.323 **	0.125 **	0.877 **	1.000

Note: ** The correlation is significant at the 0.01 level (2 tails). * The correlation is significant at the 0.05 level (2 tails). **Source:** Own elaboration based on the data analysis carried out in SPSS.

Table A4. Summary of the most relevant probit models. Dependent variable: bank credit.

Variable	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
Constant	−1.484 ***	−1.474 ***	−1.758 ***	−1.460 ***	−1.330 ***	−1.158 **	−1.630 ***	−1.333 ***	−1.250 ***	−1.648 ***
	(0.4757)	(0.3570)	(0.3809)	(0.5154)	(0.4491)	(0.5129)	(0.4653)	(0.3740)	(0.3923)	(0.3898)
Economic sector										
Manufacturing	0.2342 ***		0.2595 ***	0.3019 ***			0.2254 **			0.2341 ***
	(0.08990)		(0.08794)	(0.1109)			(0.08961)			(0.08971)
Commerce				0.1574		−0.1445			−0.1563	
				(0.1586)		(0.1302)			(0.1295)	
Services		−0.2626 **			−0.2898 ***	−0.3019 ***		−0.2682 **	−0.3001 ***	
		(0.1092)			(0.1087)	(0.1109)		(0.1093)	(0.1106)	
Enterprise size										
Small	−0.3008 ***	−0.3988 ***	−0.3332 ***	−0.4051 ***	−0.3334 ***	−0.4051 ***	−0.3537 ***	−0.3670 ***	−0.3167 ***	−0.3381 ***
	(0.1097)	(0.1020)	(0.1070)	(0.1343)	(0.1061)	(0.1343)	(0.1048)	(0.1040)	(0.1090)	(0.1069)
Medium				−0.08779		−0.08779				
				(0.1059)		(0.1059)				
Large	0.09026		0.1343						0.1186	0.1207
	(0.1056)		(0.09902)						(0.09962)	(0.09941)
Characteristics inherent to the enterprise										
Age	0.08218 *	0.09239 **	0.08904 **	0.06748	0.08906 **	0.06748	0.08293 *	0.09085 **	0.08532 **	0.08756 **
	(0.04336)	(0.04268)	(0.04255)	(0.04609)	(0.04311)	(0.04609)	(0.04297)	(0.04300)	(0.04301)	(0.04262)
Foreign participation	−0.5240 ***	−0.5337 ***	−0.5004 ***	−0.5147 ***	−0.4928 ***	−0.5147 ***	−0.5210 ***	−0.5346 ***	−0.5349 ***	−0.5308 ***
	(0.1296)	(0.1302)	(0.1269)	(0.1308)	(0.1249)	(0.1308)	(0.1300)	(0.1297)	(0.1296)	(0.1303)
Legal status of the enterprise										
Single owner	−0.1108			−0.09194	−0.1231	−0.09194		−0.1244	−0.1170	
	(0.09938)			(0.09991)	(0.09887)	(0.09991)		(0.09876)	(0.09918)	
Society or association										
Linked to enterprise performance										
Exporter	0.1191	0.1681 *		0.1240		0.1240	0.1291	0.1646 *	0.1309	0.1301
	(0.09663)	(0.09452)		(0.09695)		(0.09695)	(0.09613)	(0.09454)	(0.09646)	(0.09641)
Checking/saving account	0.1418 *	0.1471 *	0.1476 *	0.1397 *		0.1397 *	0.1468 *	0.1415 *	0.1424 *	0.1475 *
	(0.07558)	(0.07531)	(0.07544)	(0.07597)		(0.07597)	(0.07542)	(0.07544)	(0.07557)	(0.07546)
Annual sales	0.05445	0.07233 ***	0.07256 ***	0.04485	0.06348 *	0.04485	0.06184 *	0.06568 ***	0.05864 **	0.06647 ***
	(0.03511)	(0.02145)	(0.02357)	(0.03563)	(0.03360)	(0.03563)	(0.03473)	(0.02222)	(0.02468)	(0.02399)
Permanent employees	0.02387			0.03470	0.04105	0.03470	0.03869			
	(0.05339)			(0.05347)	(0.04890)	(0.05347)	(0.05014)			

Table A4. *Cont.*

Variable	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
Entrepreneur attributes										
Manager is female				−0.06397		−0.06397				
				(0.1130)		(0.1130)				
Manager experience				0.05697		0.05697				
				(0.05922)		(0.05922)				
Observations	1374	1376	1376	1365	1376	1365	1375	1375	1375	1376
McFadden's R^2	0.0639	0.0620	0.0623	0.0650	0.0604	0.0650	0.0632	0.0624	0.0640	0.0632
Log-likelihood	−890.9	−894.0	−893.7	−884.2	−895.5	−884.2	−892.2	−892.9	−891.4	−892.8
Akaike criterion	1803.9	1803.9	1803.4	1796.3	1807.0	1796.3	1802.5	1803.9	1804.8	1803.6
Schwarz criterion	1861.3	1845.7	1845.2	1869.4	1848.8	1869.4	1849.5	1850.9	1862.3	1850.6
Hannan–Quinn criterion	1825.4	1819.6	1819.1	1823.7	1822.7	1823.7	1820.1	1821.5	1826.3	1821.2
Correctly predicted cases	63.3%	62.6%	63.8%	63.2%	63.7%	63.2%	63.3%	61.7%	63.1%	63.2%

Note: The coefficients of each variable are reported in the first row. QML standard deviations are reported in parentheses in the second row of each variable. To measure the degree of significance, the following is used: * for a confidence level of 90%; ** for 95% confidence; *** for 99% confidence. For probit, the R^2 is the McFadden pseudo-R^2. An empty cell indicates that this variable was not included in the model. **Source:** Own elaboration based on the regression models estimated in Gretl.

											Profil 1	**Profil 2**	**Profil 3**	**Profile 4**	**Profile 5**	**Profile 6**	**Profile 7**	**Profile 8**	**Profile 9**	**Profile 10**
Variable	X	X	X	X	X	X	X	X	X	X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X	Beta*X
Constant	1	1	1	1	1	1	1	1	1	1	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840	-1.4840
Manufacturing sector	1	0	1	1	1	1	1	1	1	1	0.2342	0.0000	0.2342	0.2342	0.2342	0.2342	0.2342	0.2342	0.2342	0.2342
Small enterprise	1	1	0	1	1	1	1	1	1	1	-0.3008	-0.3008	0.0000	-0.3008	-0.3008	-0.3008	-0.3008	-0.3008	-0.3008	-0.3008
Enterprise age	24	24	24	1	5	10	40	60	24	24	1.9723	1.9723	1.9723	0.0822	0.4109	0.8218	3.2872	4.9308	1.9723	1.9723
Foreign participation	1	1	1	1	1	1	1	1	0	1	-0.5240	-0.5240	-0.5240	-0.5240	-0.5240	-0.5240	-0.5240	-0.5240	0.0000	-0.5240
Checking/saving account	1	1	1	1	1	1	1	1	1	0	0.1418	0.1418	0.1418	0.1418	0.1418	0.1418	0.1418	0.1418	0.1418	0.0000
Probability (Distribution Function)											**0.5158**	**0.4228**	**0.6332**	**0.0321**	**0.0640**	**0.1333**	**0.9122**	**0.9986**	**0.7135**	**0.4593**
Probabilities difference (Profile X - Profile 1)												**-0.0929**	**0.1174**	**-0.4836**	**-0.4517**	**-0.3825**	**0.3964**	**0.4829**	**0.1977**	**-0.0565**

Figure A1. Profiles of the M1 probit model. Dependent variable: bank credit. Note: In determining the profiles, only the significant variables of the probit model are considered. The estimated probabilities of each profile are compared by a difference with the probability of profile 1. For space reasons, not all the data used in the determination of the estimated probability are shown. **Source:** Own elaboration based on the regression model estimated in Gretl.

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