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Access of micro, small and medium-sized firms to bank credit: A logistic regression on a sample of Moroccan companies

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Abstract: The present study aims to analyze the determinants of the supply and demand of micro, small and medium-sized firms MSMEs credit by making reference to the theories of financial structure. From a sample of 356 Moroccan MSMEs surveyed in 2013 (WBSE, 2013), we used a binary logit model to discuss both demand and supply. According to our results, size, industry, gender of ownership, financial inclusion, level of education and experience of the Manager and the financing needs of the company, are the main factors that influence demand, while the warranty has no impact. On the supply side, with the exception of experience, the manager's characteristics have no effect, while the size, type of ownership and the duration of the loan have a major impact.

Keywords: credit demand, credit supply, logistical regression, MSMEs

1. Introduction

The MSMEs are considered to be key players in the Moroccan economy in terms of innovation and employment, they could be more so if they manage to find the sources of funding necessary for their development in the best conditions. According to Bank Al-Maghreb (2013), MSMEs represent 95% of the total of companies. They contribute to the creation of employment, added value and exports, respectively 50%, 20% and 30%. Thus, MSMEs present themselves in all sectors of activity, and are essential for the economic and social dynamics of the territories. However, financing these companies is a crucial issue in which banks play a major role. The evolution of the Moroccan financial system since the mid -1980s not being profitable for MSMEs. Indeed, the majority of these companies do not have access to the financial market and they suffer from the increase in funding and

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administrative heaviness. Obtaining credit for micro-enterprises and/or small and medium-sized businesses can be difficult insofar as the relationship between this type of business and banks is always characterized by the existence of a misunderstanding. Indeed, banks often consider MSMEs projects as being riskier than those of large companies. MSMEs complain about the way in which banks assess and analyze the risk of their projects and that banks impose too high risk premiums that are the basis of the increase in credit. Bank Al-Maghreb's quarterly survey on debtor rates with banks, finds that the average debtor rate billed by banks at MSME is higher than the rate billed for large companies (Bank Al-Maghreb, 2018). In addition, the latest High Commissioner for Planning's (HCP, 2019) survey with companies, underlines that the brakes on credits demands for MSME is essentially high interest rates, insufficient guarantees and the slowness and complication of the credit request procedure.

The objective of banks hardly coincides with the financial specificities of MSME. This objective is to contract with a borrower capable of dealing with his commitments and whose default is very low. The financial specificities of the MSME lead to that they are generally considered to be more risky: in most MSME, the entrepreneur concentrates in his hands the property and the management or the control and imposes his choices of allocation of the funds; MSME often lacks personnel resources, finance and time; Their economic environment is characterized by uncertainty; Personal relationships are more frequent; One of the major difficulties is due to their inability to provide reliable and precise information to the market (Berger & Udell, 1998).

The non-coincidence of the financial specificities of MSME with the requirements of banks sets out these companies to rationing credit which reduces their access to financing and obstructs their development and their survival (Beck & Demirgüç-Kunt, 2006). However, even if the public authorities, are aware of the importance of MSME, and have made significant efforts, such as the creation of support systems (Imtiaz, Moussanada, Guarantee Fund, etc.) and press on the credit institutions, access to MSME to financing, remains a chronic problem. According to the HCP (2019), 63% of Moroccan Very Small Enterprises "VSE" chiefs are dissatisfied with the services offered by Moroccan financial institutions and 74% invoke the lack of funding as the main obstacle to investment. According to the same study, self -financing is the main source of financing from Moroccan companies, it represents 77.6% for VSEs and 64.6% for SMEs.

If self-financing is impossible or insufficient, bank financing remains the main source of financing by borrowing for Moroccan MSME. According to Oudgou and Zeamari (2018), Moroccan SMEs only use the capital markets. Despite the efforts made, the third compartment of the Casablanca Stock Exchange has only a very limited number of SMEs. Classic financial theory can have an explanatory power of the behavior of access to the funding of MSME: on the side of the request by a less frequent recourse to bank credit especially in the start -up phase and a preference for internal funds (Myers & Majluf, 1984); On the side of the supply of financial institutions by risk aversion resulting in rationing

The aim of this study is to examine the main determinants of the supply and demand for financing Moroccan MSMEs by referring to the lessons of financial theory, the theory of compromise or Trade-Off-Theory (TOT), the Theory of the Agency, the Theory of Hierarchical Financing or Pecking Order Theory (POT) and the Theory of Credit Rationing. The data we use come from the World Bank's investigation into an initial sample of 407 Moroccan companies questioned in 2013 (WBSE, 2013). In order to comply with international standards, we have designed a coherent sample of 356 MSME excluding large companies whose workforce is greater than 200 employees (51 companies). The variables are qualitative in nature and we used a binary logit model to process both the request side and the credit offer side. To our knowledge, no document has so far addressed this question of the determinants of the supply and request for credit of MSME in Morocco.

This article is structured as follows: the first section of this article is devoted to the review of theoretical and empirical literature in order to understand the behavior of access to the funding of MSME. Which then allows you to build a series of testable hypotheses on the side of the credit request and the credit offer. The second section describes the sample, interest variables and provides descriptive statistics. The third section presents the logistics model used as well as the econometric techniques used, then analyses the empirical results. Future limits and avenues of research are ultimately exposed in conclusion.

2. Literature revue and hypotheses testable

2.1. On the side of the credit application

In the absence of a financial theory specific to Micro, small and medium-sized enterprises (MSME), the theory of compromise or *trade-off-theory* (TOT) and the theory of hierarchical financing

or *Pecking Order Theory* (POT) can have an explanatory provision for the behaviour of MSMEs in terms of access to the various sources of financing (Adair and Adaskou, 2011). The first poses the existence of an optimal debt ratio which would constitute a target for debt management. This optimal ratio must result from an arbitration between potential gains linked to debt (deductibility of interest charges) and the risks and costs that this debt (Modigliani and Miller, 1963) weighs. Conversely, the second confirms that access to financing obeys a sequential logic that the company mobilizes the financial resources it needs in a certain order established on the information asymmetry hypothesis.

Indeed, according to Myers and Majluf (1984), the financing choices being mainly determined by the level of information asymmetry, the leaders adopt a financial policy which aims to minimize the costs associated with this asymmetry and they prefer the internal financing for external financing. Thus, the leader prioritizes his preferences according to the following sequence: self -financing, non -risky debt, risky debt, capital increase (Myers, 1984) and Mulkay and Sassenou (1995). The objective of MSME leaders is to maximize their own wealth while retaining their independence from external actors, this is the reason why the internal funds are first of all the subject of their choice of financing. SMEs, who wish to borrow when their financing needs exceed their internal cash flows, are often faced in their credit relationship with opposing selection and information costs (Adair & Adaskou, 2018).

According to Stein, Ardic and Men (2013), more than two -thirds of the emergent markets do not have access to credit. They use internal funds or informal loans (family money and friends) to create and manage their businesses. In the event of external funding, MSME depend on banks, especially for short -term credits, and the financial market does not offer an alternative solution. This is in accordance with the study of Beck, Demirgüç-Kunt and Maksimovic (2008) which have found that small businesses use less external funding, in particular bank loans. Bellettre (2010) uses a no-cylinder panel of 56,605 French VSEs, observed from 1998 to 2006. It appears that the hierarchy of VSE funding should be extended as follows: internal financing (self -financing, current accounts of associates and emission of actions for the benefit of existing shareholders), supplier/leasing debts, financial debts and action emissions for the benefit of new shareholders.

The latest High Commissioner for Planning survey of 2019 indicates that one in five companies resorted to external funding. This proportion amounts to 46% for large companies and 18% among MSMEs. These depend more on commercial credit and informal sources and less on equity and formal debt than large companies; This applies both to financing fixed assets and working capital needs. The size of the company plays a decisive role in the choice between equity funding and debt financing. According to compromise theory (TOT), size must be positively linked to debt because of large companies are exposed to the risk of bankruptcy that their small counterparts. On the other hand, size can also be considered an information indicator to external donors, which should increase the share of equity rather than the share of debt. Belkhir, Maghyereh and Awartani (2016) on a panel of 444 companies in the MENA region (Egypt, Morocco and Tunisia) observed over a period from 2003 to 2011 observed a positive relationship between size and debt.

Latridis and Zaghmour (2013) on a panel of 83 Moroccan companies and 135 Turk companies over the period 2002-2011 confirmed the existence of a positive link between the size of the company and the debt, which confirms the lessons of TOT theory. On the other hand, Achy (2009) on a panel of 550 unlisted Moroccan companies observed over the 1998-2003 period found a negative link between size and debt, small companies are more indebted than large companies. Our first hypothesis, $\mathbf{H_1}$, therefore aims to test the teachings of the theory of compromise and is formulated as follows: ***the demand for credit is an increasing function of the size of the company. VSEs use internal funding more***.

The sector of activity can also have an impact on the demand for credit because each sector is characterized by clean operating methods and constitutes a synthetic indicator of the risk linked to the main activity of the company (Psillaki, Tsolas & Margaritis, 2010). However, the risk that each of the two theories (Tot and Pot) takes into account is not directly identifiable. Our second hypothesis, $\mathbf{H_2}$, on the side of the request is as follows: ***the sector of activity influences the decision to apply for credit.*** Industrial companies more use to banking credits than businesses in trade and service.

The age of the company can also be a decisive variable of credit demand. According to the theory of hierarchical financing (POT) and assuming that the self -financing capacity of the SME is an increasing function of its age, we can infer that older companies use in a less intensive manner. On the other hand, the theory of compromise (TOT) defends the thesis of a positive relationship between age and access to debt. According to the latter theory, older companies have a better reputation and greater experience that can lead to the reduction of agency costs due to a positive signal on the good quality of potential investments (Adair & Adaskou, 2011). Huyghebaert (2009) believes that age is a more relevant explanatory variable than size. An increasing maturity promotes access to internal resources which leads to reducing the use of bank credit, which validates POT. The size does not significantly affect the methods of financing companies. Our third hypothesis, $\mathbf{H_3}$, on the side of the

request, therefore aims to test the lessons of the theory of compromise (TOT) and is formulated as follows: ***the financing needs are according to the life cycle of the company (feasibility and Creation, working fund needs, growth).***

The feasibility and creation phase are funded by internal resources and informal loans (family and friends), more than by bank credit. Working fund needs are funded by a supplier credit rather than a bank credit. Growth is funded by bank credit or microcredit. The property structure can also have an explanatory power of the credit request. The study by Kremp and Philippon (2008) on a panel of French SMEs observed from 1997 to 2006 emphasizes the evolution of business ownership; It highlights that belonging to a group lightens the credit constraint of SMEs (extension of internal resources) and promotes their survival. According to compromise theory (TOT), belonging to a group can lead to the reduction of agency costs and can be considered by banks as a signal for the good financial health of the company. Conversely, the theory of hierarchical financing (POT) presupposes the existence of a negative relationship between belonging to a group and access to bank credit. Our fourth hypothesis, **H_4**, on the side of the request, therefore aims to test the lessons of the theory of hierarchical financing (POT) and is formulated as follows: ***the request for credit is a decreasing function of the opening of capital to shareholders.***

The company's qualitative variable "**genus owner**" of the company can also have an explanatory power in terms of access to bank loans. The theory of hierarchical financing (POT) presupposes a negative relationship between the level of financial debt and the female property due to the presence of information asymmetries. Women entrepreneurs often suffer from the presence of discrimination inherent in their condition of women and their credibility is often put to the test. Access to financing is undoubtedly the biggest obstacle for women entrepreneurs. Despite social reforms, Moroccan society still remains a patriarchal society. Moroccan women are mainly resorting to personal savings and informal financing to finance their activities. Our fifth hypothesis, **H_5**, on the side of the demand, therefore aims to test the lessons of the theory of hierarchical financing (POT) and is formulated as follows: ***the companies held by women are financed by personal savings and by the informal rather than a bank credit.***

Financial inclusion and registration in the commercial register (registration) are considered as two qualitative variables which explain access to bank financing. Informal companies use informal funding and/or microcredit more. Our sixth hypothesis, **H_6** can be formulated as follows: ***banking exclusion and informality negatively impact the request for credit***. The demand for credit can also be explained by the characteristics of the manager (top manager), that is to say, his level of education, his kind and his experience. The theory of compromise (TOT) considers these characteristics as a signal of good governance of the company and presupposes the existence of a positive relationship between these characteristics and access to credits.

On the other hand, the theory of hierarchical financing (POT) considers these characteristics as a signal to the external capital providers of growth opportunities in the company and in this case the company uses less to external funding. Our seventh hypothesis, **H_7**, on the side of the request, therefore aims to test the lessons the theory of compromise (TOT) and is formulated as follows: ***the characteristics of the top manager positively impact the request for credit***. Financing needs (credit purchases and assets of immobilized assets) are likely to weigh on self -financing capacity and lead the company to borrow. If we refer to the theory of hierarchical financing (POT), financing needs can weigh heavily on the financing capacity of the company and can force it to resort to loans. The combination of a situation of financing needs and very limited access to the financial markets should lead MSME to significantly request banking financing.

Conversely, if we refer to the theory of compromise (TOT) and the presence of agency costs, the relationship between these two variables should be negative. Our eighth hypothesis, **H_8**, on the side of the demand, therefore aims to test the lessons of the theory of hierarchical financing (POT) and is formulated as follows: **the financing needs positively impact the credit demand.** The holding of guarantees in the form of business assets or personal contributions from the manager can encourage companies to use bank funding. It is unlikely that financial intermediaries grant credits, especially in the long term, without obtaining guarantees. Companies whose total bodily fixed assets and stocks are more important in the balance sheet are encouraged to use more loan funding. Our ninth hypothesis, **H_9**, on the side of the request is as follows: ***the guarantees have a positive impact on the request for credit.***

The explanatory variables of credit demand are difficult to observable behaviour chosen in order to take into account the financial specificities of MSME. We have retained indicators taking into account constraints of access to resources and effects directly linked to information asymmetry and agency conflicts: Table 1 below presents our different explanatory and hypotheses, as well as that the supposed relationships between the demand for credit and these explanatory variables. These hypotheses will be tested empirically in section 4 in order to confront the lessons of the different theories existing in the case of MSMEs.

Table 1: Recapitulative of the hypotheses tests relating to the demand

Financial theory	Hypotheses	Variables reflecting	Credit application
TOT vs POT	H1	The size effect	+
TOT vs POT	H2	The risk linked to the main activity (sector of activity)	**+/-**
TOT vs POT	H3	Company life cycle (feasibility and creation, working capital needs, growth)	-
TOT vs POT	H4	The property structure and the opening of the capital	-
TOT vs POT	H5	Genre owner (women vs men)	-
TOT vs POT	H6	Financial inclusion vs Financial exclusion	+/-
TOT vs POT	H7	Top manager characteristics	+
TOT vs POT	H8	Financing needs (purchase on credit and purchasing of immobilized assets)	+
TOT vs POT	H9	The requirement of guarantees and the risks of moral hazard	+

Source: authors

2.2. On the credit offer side

Bank financing is the source of loan funding most used by entrepreneurs, especially with regard to short-term credit, in most industrialized countries (St-Pierre, 2004; 1999). However, the existence of ex-ante and ex-post information asymmetry and risk aversion resulting in credit rationing (Stiglitz & Weiss, 1981). The rationing of credit is defined as a situation of balance in which some borrowers obtain credit while others, a priori identical, are refused from credit, even if they are willing to pay a high interest rate. The fixing of a cost of credit such that offers and requests are equalized is therefore not rational behaviour on the part of banks (Levratto, 1990;1992). The latter then prefer to limit the volume of credits granted rather than increasing the required rates or guarantees (Cieply, 1997). Due to their characteristics, the MSME would be overexposed. The requirement of guarantees is the best way used by donors to compensate for the risk and are a means of self-selection of borrowers. It is unlikely that financial intermediaries grant credits, especially in the long term, without obtaining guarantees (Adair & Adaskou, 2011). Kuntchev, Ramalho, Rodríguez-Meza and Ya (2013) find in the analysis of the World Bank surveys (WBES) that SMEs are more likely to be constrained (partially or completely) on credit than large companies, constraints Credit decreasing with the size of the company, while age does not play any role, and the perception of credit constraint is a deceptive indicator. Our tenth hypothesis, **H_{10}**, on the side of the offer can be formulated as follows: ***credit supply is a function of the size of the company - increasing according to the theory of compromise (TOT)***, ***vs. decreasing according to the theory of bankruptcy costs***. Older companies would have a better reputation and more robust experience, which constitute a positive signal on the good quality of potential investments and which can cause a reduction in agency costs (Adair & Adaskou, 2011). Our eleventh hypothesis H11 is stated as follows: ***credit supply is a function of the age of the company - increasing according to agency theory, vs. decreasing according to the theory of hierarchical financing (POT).*** The credit offer can also be explained by other qualitative variables linked to the genre of the owner and the characteristics of the top manager (genre manager, experience and level of education). Our second hypothesis **H_{12}** is stated as follows: ***the quantity of credit offered decreases when the company is owned by women.*** According to the Bank Al-Maghreb (2018), Morocco is a significant delay in the field of financial inclusion with strong inequalities to the detriment of women, young people and rural populations. The characteristics of the top manager, mainly his level of study and his experience can positively impact the credit offer. A company managed by a top manager with a higher level of education and advanced experience can be considered by customer officials as a company that presents development opportunities, and therefore as a less risky company. On the other hand, the genus manager may not have an effect on the credit offer because most companies in Morocco are led by men. According to the HCP (2019), companies led by women represent only 12.8% of the total of companies. Our thirteenth hypothesis **H_{13}** is stated as follows: ***credit offer is an increasing function of the characteristics of the top manager.*** The credit offer can also be based on maturity and length of credit. In addition, SMEs finance their working funds and their investments mainly through commercial credits and informal funding sources and less capital and formal debt than large companies.

Our fourteenth hypothesis, **H_{14}**, on the side of the offer is as follows: ***the need for financing is less covered by bank credit and/or microcredit and more by commercial credit***. The results found by Kuntchev et al., (2013) are valid to a large extent to all regions of the world in development. The

main distinction is made between companies completely credit constraints, bringing together those whose loan requests have been rejected, those who have not requested it but who need additional capital, and companies not subject to credit constraints whose current financing structure supports both the working capital and the fixed assets. A third heterogeneous category includes companies partially or perhaps credit constraints that have access to other forms of external financing, although these may not meet their needs. Our last hypothesis $\mathbf{H_{15}}$ is as follows: ***the duration of the credit has a specific effect on the credit offer.***

In this study, the credit supply is deducted from credit demand due to the unavailability of data. Table 2 below presents our different variables and hypotheses, as well as the supposed relationships between the credit offer and the explanatory variables. These hypotheses will be tested empirically in section 4 in order to confront the teachings of the different theories existing in the case of MSMEs.

Table 2: Recapitulative of the hypotheses tested relating to the credit offer

Financial theory	Hypotheses	Variables reflecting	Credit offer
TOT vs POT	H10	The size effect	+/-
TOT vs POT	H11	The age and life cycle of the company	+/-
TOT vs POT	H12	Kind Property: Men vs women	+/-
TOT vs POT	H13	Top manager characteristics	+
TOT vs POT	H14	Financing needs	+
TOT vs POT	H15	The duration of the credit	+

3. Sample, interest variables and descriptive statistics

3.1. Sample

The data we use come from the World Bank's investigation into an initial sample of 407 Moroccan companies questioned in 2013 (WBSE, 2013). These data will be supplemented by surveys of other studies on Moroccan MSMEs (Bank Al-Maghreb, 2018; HCP, 2019; etc.). Companies' responses to the role of guarantees, credits and the cost of credit, will give us more information on the financing offer and the presence of information asymmetry. The WBES data source has some drawbacks. The first is linked to the question of the absence of representativeness despite the fact that WBES uses a stratified random sampling. A second drawback is the underestimation of the informal sector which represents a significant number of microenterprises of less than 10 employees not affiliated with the social security scheme. The latest drawback is the definition of MSME used by the World Bank which does not comply with the standards used by Morocco, the absence of a harmonized and homogeneous definition is a major obstacle to research in the field of SMEs. Microenterprises are defined as companies that employ less than 5 employees, while standard definition is between 1 and 9 employees. Small businesses have 5 to 19 employees, although the usual definition is 10 to 49 employees. Medium-sized companies count between 20 and 99 employees, while they should count between 50 and 200. In this study, we were able to overcome this last drawback and redefine the sample according to standards from information on information on the number of employees arranged by each company. We have chosen to delete 51 companies that record workforce above 200. Our final sample has 356 (407 - 51) companies that comply with the definition of MSME.

The distribution of our sample by size according to the type of SMEs is not proportional to the data published by the High Commission for Planning at the national level (HCP, 2019), that is to say 64% and 29% respectively for VSE and SME. According to Table 3, the WBES sample presents the following structure: 19.38%, 49.72% and 30.90% for microphones, small and medium -sized businesses respectively. Micro-enterprises and small businesses represent the largest part of the sample with 69.10% and for medium-sized businesses 30.90%. This divergence can be explained mainly by the heterogeneity of the definition of MSME used in the selection. The HCP (2019) considers that MSME is any company whose turnover is less than 75 million DH and staff less than 200 employees. Microenterprises or Very Small Enterprises (VSE) are defined as units with a turnover of less than 3MDH and a workforce less than 10 employees. Large companies (GE) are those whose turnover is greater than 75MDH or employed staff exceeding 200 people.

Table 3: Distributing by size according to the type of companies

Size	Frequency	(%)
Micro- Enterprises (-10)	69	19,38
Small Enterprises (10-49)	177	49,72
Medium-sized Enterprises (50-200)	110	30,9
Total	356	100

Source: WBES survey (2013), authors' calculations

Table 4 shows the distribution of our sample by sector according to the three categories of SMEs. All sectors are represented in this survey except agriculture, financial activities and administration which are a different funding mode. The industry, trade and services sectors (ICT and BTP) represent 49.72%, 24.16%, 26.12% respectively. The industry sector concentrates the largest number of companies.

Table 4: Distributing by size according to the type of activity sector

Size		Sector			
		Industry	Trade	Service (TIC et BTP)	Total
Micro-enterprises	N	32	14	23	69
	%	8.99	3.93	6.46	19.38
	% on line	46.38	20.29	33.33	
	% in column	18.08	16.28	24.73	
Small enterprises	N	85	44	48	177
	%	23.88	12.36	13.48	49.72
	% on line	48.02	24.86	27.12	
	% on column	48.02	51.16	51.61	
Medium-sized enterprises	N	60	28	22	110
	%	16.85	7.87	6.18	30.90
	% on line	54.55	25.45	20.00	
	% on column	33.90	32.56	23.66	
Total		177	86	93	356
		49.72	24.16	26.12	100.00

Source: WBES survey (2013), authors' calculations

In order to analyse the request for credit of the MSME, we have chosen to break down the global sample into two sub-samples: MSME which did not submit a loan/credits request to financial institutions and those that have submitted a loan request to finance the working capital requirements and/or immobilized assets such as machines, equipment, vehicles, etc. Table 5 below indicates that the proportion of MSME which requested a credit from financial institutions is 13.5% (48/356). This proportion is 10.39% for medium -sized enterprises and only 1.12% for VSEs. Table 5 also indicates that on the sub-sample of 48 MSME which submitted a loan/credits request in 2012, only 17 companies obtained a credit, while 31 did not obtain it. The acceptance rate is an increasing function of size. Credit demand is also an increasing function of the size of the company. Out of a total of 37 medium-sized businesses, 28 companies have managed to obtain a credit. The first sub-sample indicates that 308 MSME, 86.52% of the overall sample did not submit a loan request in 2012. The HCP study (2019) found that 35% of the companies surveyed asked for a Credit from banking institutions and that among very small businesses who asked for a credit, 28% did not have a favourable response to their request.

Table 5: Request for loan to financial institutions in 2012

Credit Demand		Non application	Application (demand)			Total
Categories			**With success (offer)**	**Without success**	**Total**	
Micro-enterprises	N	65	1	**3**	**4**	69
	%	18.26	0,28	0,84	1.12	19.38
Small enterprises	N	170	2	**5**	**7**	177
	%	47.75	0,56	1,4	1.97	49.72
Medium -sized	N	73	**28**	9	**37**	110
enterprises	%	20.51	7,87	2,53	10.39	30.90
Total	N	**308**	**31**	**17**	**48**	**356**
	%	86.52	8,71	4,78	13.48	100.00

Source: WBES survey (2013), authors' calculations

The 308 MSME did not submit a loan request in 2012 for the following reasons (see Table 6 below): 65.26% of these companies reported who they do not need, they have enough capital. For others, or 34.74%, they did not submit a loan request due to the existence of different costs: the

procedures for obtaining a loan are too complicated, the interest rate is too high, the requested guarantees are too large, the amount and duration of the credits offered are insufficient, etc. Companies that do not need credit are mainly small businesses (35.39%). Small companies are those that have mentioned the existence of barriers and costs that prevent them from asking for loans. For HCP (2019), 28% of very small businesses failed to have a credit due to the insufficient guarantees, high interest rates, slowness and complication of the request procedure and the lack of confidence in the company.

Table 6: Reasons for non -request for loans in 2012

Reasons / Categories		Non-request	Costs	Total
Micro-enterprises	**N**	38	27	65
	%	12.34	8.77	21.10
Small enterprises	**N**	109	61	170
	%	35.39	19.81	55.19
Medium -sized enterprises	**N**	54	19	73
	%	17.53	6.17	23.70
Total	**N**	201	107	308
	%	**65.26**	**34.74**	100.00

Source: WBES survey (2013), authors' calculations

3.2. Variables of interest and descriptive statistics

Our variables explained are the loan request (application) and the loan offer (successfully application). Our explanatory variables are classified into 4 main categories: (i) the characteristics of the company (size, sector of activity, age, property, registration and financial inclusion); (ii) the characteristics of the manager (top manager experience, top manager sex and top manager training); (iii) the need to finance the company (credit sale, credit purchase and purpose of the loan); (iv) the characteristics of the loan (piling and duration of the loan). The dictionary of interest variables is presented in Annex 1.

Table 7 below indicates that the size effect is important: the share of MSME which have managed to have a credit is an increasing function of size. According to the theory of compromise (TOT), the MSME which decide to increase their employee workforce can be considered by capital providers as companies which have growth opportunities and which are in financial "health", it means MSME which are less exposed to the risk of bankruptcy (Adair and Adaskou, 2011). Also, the MSME that requested a credit are mostly mature and the owners are mostly men. This last result can be explained by the fact that business managers make more confidence in older MSME than youth MSME and start -ups which present a higher risk of non-reimbursement and that Moroccan companies are mostly held by men, which explains that Moroccan society is still patriarchal. The sector of activity is a synthetic indicator of the risk linked to the main activity of the company (Psillaki, Tsolas and Margaritis, 2010). In our case, industry is a determinant of obtaining credit: 62% of the MSME that requested credit operate in the industry.

Table 7: CHARACTERISTICS OF THE MSME which asked for a loan

Demand of credit		Sector				Age			Gender		Registration	
		Total	**Industry**	**Trade**	**Services**	**Start-up**	**Young**	**Mature**	**Male**	**Female**	**Formal**	**Informal**
Success	**Micro**	1	0	1	0	0	0	1	1	0	1	0
	Small	2	1	0	1	0	1	1	2	0	2	0
	Medium	28	17	6	5	0	0	28	23	5	28	0
	Total	**31**	18	7	6	0	1	30	26	5	**31**	0
Failure	**Micro**	3	3	0	0	0	1	2	2	1	3	0
	Small	5	4	1	0	0	0	5	5	0	5	0
	Medium	9	5	2	2	0	1	8	6	3	7	2
	Total	**17**	12	3	2	0	2	15	13	4	**15**	**2**

Source: WBES survey (2013), authors' calculations

We can observe that the relationship between size and financial inclusion is a positive relationship (see appendix 2). Table 8 shows that financial inclusion and registration (registration in the commercial register) are two essential conditions for obtaining credit. The table below also

shows that 57.9% (206/356) of the MSME decided not to ask for a credit despite that they are financially included and registered.

TABLE 8. Financial inclusion, registration and results of the loan request

	No application			Application						Total
			Total	With Success		Total	Without Success		Total	
	Inclusion	Exclusion		Inclusion	Exclusion		Inclusion	Exclusion		
Non-Registered	5	8	13	0	0	0	2	0	2	15
Registered	206	89	295	28	3	31	15	0	15	341
Total	211	97	308	28	3	31	17	0	17	356

Source: WBES survey (2013), authors' calculations

4. Logit model and results: Request versus credit offer

4.1. Model

We test the determinants of the credit request and the credit offer on a sub-sample of 48 companies that requested a credit in 2012.

the first model analyses the credit demand for these companies according to the offer. The credit request is the explained variable which is measured by two binary results (see frame 1 below). the model estimates the probability of requesting and obtaining a credit in 2012 and highlights the determinants of the loan request for these MSMEs.

The second model analyses the credit offer by financial institutions (banking and non - banking) to these companies which asked for credit in 2012. The loan granted is the explained variable, which is measured by two binary results (cf. frame 1 below). the model estimates the probability of access to the various sources of financing in 2012 and highlights the determinants of access for these MSMEs.

Frame 1. Credit supply model and request model

The credit demand model is as follow:

$$demand_i = \begin{cases} 1 \; if \; the \; firm \; demanded \; a \; credit \; in \; 2012 \\ 0 \; if \; the \; firm \; didn't \; need \; a \; credit \; in \; 2012 \end{cases}$$

The credit offer model is as follow:

$$offer_i = \begin{cases} 1 \; if \; the \; firm \; has \; received \; a \; credit \\ 0 \; if \; the \; firm \; hasn't \; received \; a \; credit \end{cases}$$

Both models are estimated using the following equation:

$$P_{ij} = \sum_j \alpha_j X_{ij} + \sum_j \beta_j V_{ij} + \sum_j \gamma_j W_{ij} + \sum_j \delta_j Z_{ij} + \varepsilon_j$$

The explanotary variables of this equation are presented in the annex 2:

X_{ij} firm characteristics (dummy variables size, sector, age, ownership, female ownership, registration, financial inclusion, turnover)

V_{ij} characteristics of manager (top gender manager, level of education in eating, top eating experience)

W_{ij} business financing needs (purchase on credit, sale on credit, purchase of fixed assets during 2012

Z_{ij} loan characteristics (collateral, interest rate, loan term)

ε_j error term

4.2. Result for the credit request model

The results of the estimation of credit demand indicate that R2 is 29.14%, that is to say that the explanatory variables chosen are relevant. The Wald test is significant at 1 %, which shows that our model is significant. The prediction table (see appendix 3) shows that for companies that have requested credit (48 companies) 15 out of 22 have been well predicted (probability greater than 0.5) and for companies that have not Credit requested (308 companies), 301 cases out of 334 have been very predicted. The rate of prediction of the request model is equal to the sum of the cases properly predicted (15+301) relating to the total number of observations (356), i.e. a prediction rate of 88.76%.

The coefficients as presented in Table 9 below are not marginal impacts, only their signs are interpretable. The marginal impact in a logit model varies from one observation to another (companies in our case), it depends on the values of the explanatory variables. For the needs of the interpretation of the coefficients, the average marginal impact (DY/DX) has been calculated.

Table 9: Results of estimates of the loan request

Credit Demand	Coefficients	z	P>z	dy/dx	z	P>z
Cut						
Micro-enterprises	0,5456 (0,7105)	0,7700	0,4430	0,0345 (0,0529)	0,6500	0,5150
Medium-Sized companies	1,4248*** (0,5260)	2,7100	0,0070	0,1025** (0,0539)	1,9000	0,0570
Sector						
Industry	0,7245*** (0,3624)	2,0000	0,0460	0,0399** (0,0215)	1,8600	0,0630
Business age						
Stingy	0,8273 (0,8181)	1,0100	0,3120	0,0352* (0,0246)	1,4300	0,1520
Kind of property						
Women	-0,9230** (0,4900)	-1,8800	0,0600	-0,0414*** (0,0205)	-2,0300	0,0430
Property						
Shareholders	0,5221 (0,4652)	1,1200	0,2620	0,0313 (0,0332)	0,9400	0,3460
Partners	-0,4806 (0,4720)	-1,0200	0,3090	-0,0247 (0,0226)	-1,0900	0,2750
Financial inclusion						
Financial inclusion	0,9932* (0,6555)	1,5200	0,1300	0,0456** (0,0244)	1,8700	0,0620
Registration						
Registered company	0,1627 (0,6799)	0,2400	0,8110	0,0083 (0,0326)	0,2500	0,8000
Gender manager						
Women	-0,0493 (0,6038)	-0,0800	0,9350	-0,0026 (0,0315)	-0,0800	0,9340
Manager's level of instruction						
Superior	1,7549* (1,1447)	1,5300	0,1250	0,0652** (0,0339)	1,9300	0,0540
Secondary	1,0453 (1,1997)	0,8700	0,3840	0,0781 (0,1193)	0,6500	0,5120
Top manager experience						
Mature	1,5482** (0,9152)	1,6900	0,0910	0,0593*** (0,0223)	2,6600	0,0080
Financing needs						
Credit purchases	1,0175*** (0,4300)	2,3700	0,0180	0,0576*** (0,0286)	2,0100	0,0440
Purchases of immobilized assets	0,9069*** (0,3944)	2,3000	0,0210	0,0628*** (0,0335)	1,8800	0,0610
Characteristics of demand						
Guarantees	-0,2019 (0,8699)	-0,2300	0,8160	-0,0101 (0,0406)	-0,2500	0,8030
Constant	-8,5249*** (2,0735)	-4,1100	0,0000			
MSME	356					
Log Likelihood	-99,76					
Pseudo R2	29,14%					
Wald chi2(16)	59,88					
Prob > chi2	0,0000					
Model Prediction Rate	88,76%					
Marginal impact after logit	0,0575					

***significant at threshold of 1%, ** significant at threshold of 5% et * significant at threshold of 10%. Parenthesis figures are standard deviations

According to our estimates, the size, the sector of activity, the age of the company, the kind of ownership, financial inclusion, level of education and the experience of the manager and the financing needs of the company are variables that influence significantly the request for credit. On the other hand, property, recording, gender manager and guarantees are non-significant variables.

We observe that the size affects the demand for credit, this latter is an increasing function of the size of the company. The coefficient associated with the medium-sized enterprises indicator variable is positive and significant with a 5% threshold and the coefficient associated with the micro-enterprise indicator variable is positive and not significant. The small firms' variable is considered a reference. This result means that credit demand increases by 10,25% when it comes to a medium - sized company. Micro-enterprises and small businesses can depend more on their own funds and / or there may be obstacles to access to financing.

The hypothesis 1 **«H_1»** of a positive correlation of size with the request for credit is therefore verified. Credit demand is an increasing function of business size. VSEs use internal funding more. This result combines with that of Belkhir, Maghyereh and Awartani (2016) and Latridis and Zaghmour (2013) which found a positive link between size and debt respectively for the countries of the MENA region (Egypt, Morocco and Tunisia) and for a range of Moroccan and Turkish companies. On the other hand, Huyghebaert (2009) found that size does not really affect companies' financing sources. The lessons of the theory of compromise (TOT) are therefore verified in our study: the size must be positively linked to debt because large companies are less exposed to the risk of bankruptcy than their small counterparts.

The sector activity, which is considered a synthetic risk indicator, influences the decision to request a credit. The demand for credit differs from one sector to another. The coefficient associated with the Indicator Industry variable is positive and significant. If the workforce of industrial companies increases the demand for credit by 1% increases by 4%. This result tends to confirm our hypothesis 2 **«H_2»**, industrial companies more use to banking credits than companies working in trade and service.

As for age, maturity (elderly enterprise) positively influences the company's decision to request a loan. The coefficient associated with this variable is positive and significant at 10%. Credit demand increases by 3.52% compared to that of young and/beginner's companies. Indeed, the need for financing can increase during the life cycle of MSME. The low significance of the maturity variable can be explained by the fact that mature MSMEs can have self-financing capacity and therefore need less external funding. The hypothesis 3 **«H_3»** of a positive relationship is confirmed, which tends to confirm the teachings of the TOT. This result is disagreeing with that of Huyghebaert (2009) which found that growing maturity promotes access to internal resources which leads to reducing the use of bank credit, which validates POT.

Female property is negative and highly significant at the 1% threshold. Credit demand decreases by 4.14% when it comes to companies held by women who prefer self-financing on bank credit. The female entrepreneur is someone who promotes the independence and autonomy of the company on the opening of capital and access to external funding. This result tends to confirm hypothesis 5 **«H_5»**, companies held by women are funded by personal savings and informal rather than bank credit. This result confirms that of Bank Al-Maghreb (2018, p. 105) which said that Morocco is delaying in the field of financial inclusion with strong inequalities to the detriment of women, young people and rural populations. To our knowledge, there are few studies in Morocco who have chosen to deal with the impact of owner sex on access to funding. Our result validates to a certain extent the teachings of the pot which presupposes a negative relationship between the level of financial debt and the female property due to the presence of information asymmetries.

Financial inclusion reflects business access to financial services. This variable is significant at the 5% threshold and positively correlated with credit demand. An increase in financial inclusion of 1% increases credit demand by 4.56%. Indeed, the holding of a bank account or a savings account is more promising for the request for credit, while the registration (registration) of the company is less promising (the recording variable is not significant). The hypothesis 6 **«H_6»** of a positive correlation between financial inclusion and the request for credit is therefore verified. So, banking exclusion and informality negatively impact the request for credit.

As for the characteristics of the top manager, the level of higher education is positive and significant at the 5% threshold. Credit demand increases by 6.52% when it is a company managed by a manager with a higher level of education. Credit demand is increasing in the manager's level of education. Managers of the primary and/or secondary level prefer internal funding on external financing. The experience of the Manager Impact also requests for credit. The manager's maturity is positive and highly significant at the 1% threshold. The hypothesis 7 **«H_7»** is therefore verified, which validates the theory of the compromise (TOT) which considers the characteristics of the manager as a signal of the good governance of the company and presupposes the existence of a positive relationship between these characteristics and the "Access to credits".

Financing needs (credit purchases and assets of immobilized assets) are likely to weigh on self -financing capacity and lead the company to borrow. The purchase on credit is highly significant and positive, which increases the probability of requesting a loan. This suggests that commercial credit and bank credit are two additional sources of financing. An increase in commercial credit of 1%

increases credit demand by 5.76%. Long-term financing needs positively and significantly impact the demand for credit. The coefficient associated with the fixed asset purchases variable is positive and significant with the 1% threshold. Credit demand is an increasing function of financing needs. The hypothesis 8 **«H_8»** of a positive correlation is therefore verified: long-term financing needs positively and significantly impact the demand for credit. The coefficient associated with the fixed asset purchases variable is positive and significant with the 1% threshold. Credit demand is an increasing function of financing needs. This result confirms the teachings of pot theory, financing needs can weigh heavily on the financing capacity of the company and can force it to resort to loans. The combination of a situation of financing needs and very limited access to the financial markets should lead MSME to significantly request banking financing.

Unlike our expectations, the guaranteed variable is not significant and has no influence on credit demand. We cannot confirm or deny hypothesis 9 **«H_9»** of a positive correlation between guarantees and credit demand.

4.3. Result for the credit offer model

The credit supply is deduced from demand due to the lack of data. Table 10 presents the estimate of the loan offer (loan granted). The results of the credit supply estimate indicate that R2 is 39.05%, which means that the explanatory variables chosen explain 39.05% of the explained variable. The Wald test is significant at 1 %, which shows that our model is significant. The prediction table (see appendix 4) shows that for companies that have succeeded in having a bank credit (31 companies) 10 out of 15 cases have been well predicted (probability greater than 0.5) and for companies which did not succeed in having a credit (288 companies), 283 cases out of 304 were very predicted. The prediction rate of the credit supply model is equal to the sum of cases properly predicted (10+283) relating to the total number of observations (319), a prediction rate of 91.85%.

10: Credit offer estimates results

Offer de credit	Coefficients	z	P>z	dy/dx	z	P>z
Cut						
Micro-enterprises	0,2407 (1,3366)	0,18	0,857	0,0061 (0,0359)	0,17	0,866
Average companies	2,4687*** (0,8678)	2,84	0,004	0,1063** (0,0637)	1,67	0,095
Sector						
Industry	0,0304 (0,5048)	0,06	0,952	0,0007 (0,0119)	0,06	0,952
Business age						
Stingy	1,3366 (1,2170)	1,1	0,272	0,0216* (0,0132)	1,64	0,102
Kind of property						
Women	-1,4296*** (0,6764)	-2,11	0,035	-0,0252*** (0,0133)	-1,89	0,058
Property						
Shareholders	0,2120 (0,5795)	0,37	0,715	0,0052 (0,0153)	0,34	0,734
Partners	-0,4447 (0,6439)	-0,69	0,49	-0,0100 (0,0138)	-0,72	0,471
Financial inclusion						
Financial inclusion	-0,6928 (0,7876)	-0,88	0,379	-0,0191 (0,0280)	-0,68	0,495
Gender manager						
Women	-0,4868 (0,8228)	-0,59	0,554	-0,0094 (0,0129)	-0,73	0,463
Manager's level of instruction						
Superior	0,7111 (1,1871)	0,6	0,549	0,0139 (0,0204)	0,68	0,495
Secondary	0,4890 (1,2375)	0,4	0,693	0,0134 (0,0396)	0,34	0,734
Top manager experience						
Mature	1,2842 (1,1849)	1,08	0,278	0,0221* (0,0156)	1,42	0,157
Financing needs						
Sales on credit	1,0690** (0,5518)	1,94	0,053	0,0265* (0,0187)	1,42	0,156
Purchases of immobilized assets	1,0345***	2,14	0,032	0,0329*	1,61	0,108

	(0,4830)			(0,0205)		
Credit duration						
Very short term	0,2313 (1,0164)	0,23	0,82	0,0060 (0,0296)	0,2	0,838
Short term	1,5182*** (0,6741)	2,25	0,024	0,0702*** (0,0552)	1,27	0,0203
Constant	-7,2288*** (2,4280)	-2,98	0,003			
MSME	319					
Log Likelihood	-61,99					
Pseudo R2	39,05					
Wald chi2(16)	55,90					
Prob > chi2	0,0000					
taux de prédiction du modèle	91,85					
Impact marginal après logit				0,0240		

***significant at the threshold of 1%, ** significant at the threshold of 5% and * significant at the threshold of 10%.

Parenthesis figures are standard deviations

According to estimates, the size, the age of the company, the property, the experience of the top manager, sales on credit, purchase of immobilized assets and the duration of the loan are the variables which considerably influence the decision to grant a loan. On the other hand, the variables sector of activity, ownership, financial inclusion, gender manager and level of instruction of the manager do not play any influence on the credit offer. We have chosen to remove the guaranteed variable due to the presence of the problem of collinearity. As in the case of demand, we later comment on the results of the average marginal impact (DY/DX).

The size of the company has an impact on the probability of accessing credit. The coefficient associated with the average company indicator variable is positive and significant at 5%. Medium-sized companies are more likely to obtain bank credit because these companies are less risky than very small and small companies. The hypothesis 10 **«H_{10}»** of a positive correlation is confirmed. This result validates the theory of compromise (TOT) and rejects the thesis that growth opportunities would be interpreted by banks as a signal from a risky company. The risk of bankruptcy would be less for large than small businesses due to the diversification of their investments. MSMEs which increase their employee workforce can be considered by lenders as prosperous companies who have growth opportunities and which are less prone to the risk of bankruptcy. Our result is in accordance with the result Kuntchev et al., (2013) and Adair and Adaskou (2020) which found that credit constraints decreasing with the size of the company.

The company's age variable is significant on the threshold of 10% and positively correlated with the loan offer. If age increases by 1%, the credit supply increases by 2.16%. This result confirms the predictions of compromise theory (TOT), because older companies have a better reputation and greater experience that can reduce agency costs thanks to a positive signal. The hypothesis 11 **«H_{11}»** that the credit supply is an increasing function of the age of the company is therefore verified. This result is in agreement with Alexandre and Buisson-Stéphan (2014).

Female property is negative and highly significant at the 1% threshold. The probability of benefiting from a bank loan as a woman business manager is 2.52% lower than for men. This result confirms our hypothesis 12 **«H_{12}»** which stipulates that the credit offer decreases when it is a company owned by women. The Moroccan company still remains a patriarchal company, a Moroccan woman is less likely than a man to have a bank credit and to have recourse to a form of formal borrowing. To finance their activities, women entrepreneurs mainly use money from their family and/or friends or from microfinance institutions. According to Benazzi (2016), women Moroccan entrepreneurs prefer to finance their projects thanks from personal savings or family aid. Thus, in the culture of Moroccan SMEs, most of the financing of the women's business, is made up of personal and family contribution and the use of bank credit remains very low and remains an exception. This preference for equity is explained by the difficulties encountered by Moroccan women to obtain bank loans. Benazzi (2016) claims that these difficulties are not linked to sex-based discrimination, but they are linked to the solidity of the credit application file in terms of guarantees and the excessive cost of funding imposed on entrepreneurs in general.

Regarding the impact of the characteristics of the top manager, the manager's experience has a positive and weakly significant impact. The hypothesis 13 **«H_{13}»** of a positive correlation between the characteristics of top manager and credit offer is verified. The manager's experience can be considered by the customer manager as a signal for good governance of the company. The MSMEs led by an experienced manager would be considered by banks as companies benefiting from growth

opportunities and which are less exposed to the risk of bankruptcy. Contrary to our expectations, the gender management variables and level of studies are not significant in this study.

Access to credit is all the more favourable for MSME using credit sales, which turns out to be positive and weakly significant at the 1% threshold. This can point out a good customer relationship and promising turnover. The object of the loan is positive and important. Only one funding need, mainly for the working capital, increases the probability of obtaining a credit. MSMEs are more encouraged to finance their capital with bank loans. The hypothesis 14 **«H_{14}»** of a positive correlation between the need for financing and the bank credit is confirmed.

The duration of the loan has a positive and significant effect on the decision to grant credit. The more MSME chooses a short-term loan, the greater the probability of obtaining a credit compared to those that borrow in the very short term and in the longer term. The hypothesis 15 **«H_{15}»** that the duration of the credit has a specific effect on the credit supply is therefore verified. This result can be explained by the preference of financial institutions to grant loans over a short-term period in order to be protected against the risk of non-reimbursement.

5. Conclusion

The present study investigated the access to funding from a sample of 407 Moroccan companies interviewed in 2013 (WBSE, 2013). In order to comply with international standards, we have designed a coherent sample of 356 MPME excluding large companies whose workforce is greater than 200 employees (51 companies). We focused on a sub-sample of 48 companies that requested a loan (loan request), separating those which obtained a loan (31 companies) from those which were rejected (17 companies). 308/356 (86.52 %) have preferred to don't ask for a credit in 2012. We used a binary logit model to process both the request side and the credit offer side. The request for credit is not based on financial inclusion and registration, 57.9% (206/356) of the MSME decided not to ask for a credit despite that they are financially included and registered.

The results of statistically significant estimates show that the demand for bank credit is determined by factors such as size, sector of activity, business age, property, financial inclusion, level of education and the Manager's experience and business financing needs. The size effect is present in our study; credit demand is an increasing function of the size of the company. The need for funding can increase during the life cycle of MSME. Industrial companies more use to banking credits than businesses in trade and service. Companies owned by women are funded by personal savings and informal rather than bank credit. Holding a bank account or a savings account is more promising for the credit request, while the company's registration is less promising. Credit demand is based on the characteristics of the top manager (genre, level of education and experience). The characteristics of the manager can be considered as a signal of the good governance of the company. Financing needs (credit purchases and assets of immobilized assets) are likely to weigh on self-financing capacity and lead the company to borrow. The teachings of compromise theory, agency theory and the theory of hierarchical financing are validated to the variables attributed to the request for credit.

The credit supply can only be explained by the lessons of the theory of credit rationing and the presence of ex-ante and ex post asymmetry. The credit offer is deduced from the request because we do not have data. The results of the statistically significant estimates also show that the size, the age of the company, the genus ownership, the top manager experience, credit sales, fixed asset purchases and the duration of the loan are the variables that considerably influence the decision to grant a loan (credit offer). The size and maturity of the company have a considerable impact on the decision to grant a credit. Regarding financial inclusion, the Moroccan company still remains a patriarchal company, a Moroccan woman is less likely than a man to have a bank credit and to have recourse to a form of formal borrowing. To finance their activities, women entrepreneurs mainly use money from their family and/or friends or from microfinance institutions. The MSMEs led by an experienced manager would be considered by banks as companies benefiting from growth opportunities and which are less exposed to the risk of bankruptcy. The credit offer is in increasing function of financing needs and the duration of the loan.

Admittedly, there are gaps in our study, which leave enough space for more extensive research. Until now, we have used a transversal analysis in a single year; We could not discern a trend that would require panel data (inter-individual and inter-temporal analysis). The supply is deduced from demand due to a lack of data on the supply. The guarantees do not influence the supply and demand for credit in our study, while this variable plays a major role in the lender-borrower relationship. The interest rate is a decisive variable of credit demand, but we do not have data concerning this variable. As for demand, the self-selection of MSMEs which refrain from requesting a bank credit is a promising research track. Taking into account the dichotomy between informality and formality remains an important question of research to take into consideration. And finally, the decomposition of the size according to the activity sectors also remains an interesting research track.

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