
Laboratoire
de Recherche
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LARGE LARGE

Papier
n° 90

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Octobre 2007

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«SME’s main bank choice and organizational structure: Evidence from France»

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Abstract: The theory suggests that decentralized structures are more efficient than hierarchical ones in decisions based on soft information. According to this, small banks that often have a decentralised structure are more attractive when customers are opaque ones. We propose to test this affirmation using a panel of 6.258 couples (main bank/SME) working in the French market. The results of our several regressions show the existence of a strong tie between the firm’s informational opacity and the choice of a decentralised bank. Moreover, opaque firms are more likely to be credit constrained if they choose a hierarchical bank as their main bank.

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Keywords: Main bank, informational opacity, organizational structure, small and medium sized businesses, relationship lending.

JEL classification : G21, D82

¹ Corresponding Author, Email: hiba.hajjchehade@gmail.com. Phone: +33.6.61.98.91.78/ Fax: +33.3.20.90.76.29. We wish to thank the “Pôle de Recherche Régional en Finance” for providing the access to the databases used in this study (DIANE and Bankscope), and particularly the “Conseil Régional Nord Pas de Calais” and the “Credit Mutuel Nord Europe” who provide the financial support for this Pole. We also would like to thank Professors Eric DeBodt and Frédéric Lobez for their very useful comments. We thank as well Jun Yao and other conference participants at the 2006 NTU International Conference on Finance in Taipei for helpful discussions and comments. All remaining errors are ours.

Introduction :

When creating a company, the project success is often conditioned upon research of financial partners. In addition to gathering funds, managers should be establishing good relationships in order to both assure a regular financing for meeting the company's future growth, and support the institution in the event of any financial crises. This is more complicated when the firm's activity is opaque or uncertain. Modern financial theory focuses on the role of banks in reducing the problems of asymmetric information (Allen, 1990) by having a comparative advantage as relationship lenders. This is what allows them to propose contracts adapted to every situation.

This doesn't mean that they are counting on a uniform solution for all their clients. Actually, banks propose two different types of financing: transactional and relational. The first which is based on quantitative information, where the best example is credit scoring, relies on the diversification of operations. The second method is instead based on qualitative data, such as personal information. It consists of monitoring clients through a number of contracts over time (Sharpe, 1990). The several interactions allow improving the credit terms obtained by opaque borrowers that are unable to provide standardized information (Petersen et Rajan, 1994; etc....). Stein (2002) shows that this kind of financing is more efficient in a decentralized banking structure. Considering the nature of the information gathered which is hardly transmitted through the hierarchy, the loan officer is likely to be more reluctant to establish this kind of relationship with clients if he doesn't have enough autonomy to take a decision.

Accordingly, the question to address is the following: Are opaque firms able to lean toward decentralized banks that are more likely to provide them with relationship lending? Moreover, answering this question is also important in the context of banking consolidation. The recent trend towards mergers and acquisitions in the banking system results in large organizations unable to provide relational financing. Small opaque businesses will then have more difficulties to obtain credit.

In the previous literature, there are not many empirical elements that can help us examine this question. The main result highlighted in these studies is that bank's size affects its ability to provide credit to small firms (Berger, Klapper and Udell, 2001; Berger, Rosen

and Udell, 2002). Using the same logic, Berger, Miller, Petersen, Rajan and Stein (2002) show that small and medium businesses that borrow from large banks are paying their trade credit late; this can be explained as a financial stress indicator. The relationship between bank's size and its customer's size can be the result of prudential constraints. Small banks must diversify their portfolio of customers by limiting important credit commitment. However, this is not the only possible explanation. Cole, Goldberg and White (2003) showed that large financial institutions use different technologies, based on standard techniques, to deal with small opaque clients.

The purpose of this paper is to analyze the choice of a main bank by small and medium sized French firms. The study is conducted on a sample of 6 258 SME that are less than five years old. These firms are representative of opaque agents of the economy that search for relationship financing. We show that firms with problems of asymmetric information tend more toward decentralized banks. On the other hand, those working with hierarchical lenders are more likely to be rationed in credit. These results consider also the control factors such as sector specialization of the bank, the market's expansion of the firm, and its apparent risk. This tends to confirm the hypothesis about the relationship between the organizational structure of the bank and its ability to provide relational financing.

The remainder of the paper is organized as follows. The next section presents briefly the main theoretical and empirical works related to our subject. In section 3, we present the hypothesis we want to test and the data set used. Section 4 summarizes the different results obtained, and the last section concludes.

2. Related literature:

In a perfect market, the classical financial theory suggests that every project with a positive net present value can be easily financed. But in the reality, there are several market's imperfections like asymmetric information and agency costs that make the credit access for some structures, even the profitable ones, more difficult. (Stiglitz and Weiss, 1981). Asymmetric information problems are more prevalent in small and medium sized businesses. Because they don't have the adequate ways to efficiently communicate with regard to their

financial situation, these firms are more likely to be constrained in credit and will have to pay higher interest rates.

Many economists such as Leland and Pyle (1977), Fama (1985), Haubrich (1989), etc., have examined this question and showed that financial institutions, especially banks, have a particular expertise in solving these kinds of problems. Through multiple interactions over time with their customers, banks acquire private information about their financial perspectives that are essential to decision making for credit approval (Diamond, 1984). Banks thus develop scale economics in the production of information² and provide their customers better credit terms compared to their peers. This is what we call « relationship lending » in opposition³ to “the arm’s length financing”⁴.

Relationship banking is beneficial to the firm because it improves credit terms by reducing the asymmetric information. Many empirical studies⁵ showed that long relationships between banks and firms allow them to pay a lower interest rate⁶, to give less guarantees and to have a better credit availability.

However, to compare these two kinds of financing, we should also consider the type of information used in decision making. More recent studies pointed out that in relationship lending, the information gathered is soft, i.e. qualitative. It is the result of physical and specific interactions between the client and his loan officer, of contacts with the stakeholders (suppliers and customers) and the firm’s environment. We can also consider the track record of the firm (Stein (2002), Berger, Klapper and Udell (2001)). This soft information is not easily transmitted through the hierarchy, in opposition to classic hard information, i.e. quantitative that we can take from the financial statements, scoring or any other quantitative similar method.

² Guigou and Vilanova (1999) provide a detailed review of the literature on the role of banks in information production and treatment.

³ Many empirical and theoretical studies had examined this opposition between relationship and arm’s length financing. (See Rajan (1992), Diamond (1991), Boot and Thakor (2000) etc.).

⁴ Transactional or arm’s length lending relies on standard transactions (Boot, 2000). Banks don’t play any role in project’s profitability and success. There is no direct control on the firm’s activity. They are like simple broker or trader on capital market (Boot and Thakor, 2000).

⁵ In these different studies, the three terms of the credit contract are not analyzed stimulatingly. Since the famous paper of Petersen and Rajan (1994) on the american market, many analysis has been conducted on the different developed economies, such as Cole (1998) on the american case, D’auria and al. (1999) in Italy, Elsas and Krahen (1998) and Haroff and Korting (1998) on the German market, Vigneron (2006) et Ziane (2003) in France, etc.

⁶ The impact on interest rates is not significant in all studies.

According to Stein (2002)⁷, the ability of banks to generate soft or hard information depends on their organizational structure. In his theoretical paper, he assesses two different organizational forms: the decentralized with few decision makers and few investment projects, and on the other hand the hierarchical form with multiple management layers who have to evaluate many projects. The purpose is to determine the organizational form that permits efficient allocation of capital each type of project. Thus, a decentralized structure is more attractive when the information cannot be credibly transmitted; this is the case of soft information, because there are limited decisions levels. On the other hand, hierarchical firms have a comparative advantage when the information is hard.

Stein's model remains very general. But as a direct application of his theory, he proposes the consequences of banking consolidation on small and medium sized businesses lending. The numerous mergers and acquisitions results in large banking institutions unable, according to the theory, to provide relationship lending that requires soft information. As a consequence, there will be a decline in SME financing. Why? Small firms, in need of capital to finance small projects, don't have necessarily reliable quantitative hard data to give to their lender. If they choose to deal with a hierarchical bank, the information needed for credit approval will be produced by the loan officer⁸, far from the ultimate decision maker, the CEO. In reference to these theoretical arguments, we can think about any rationality in the choice of the main bank by the firm, considering the organizational form of the lender. This may lead us to formulate the main question of our study:

« Does a decentralized bank have a comparative advantage in producing and analyzing soft information, and as a consequence would it be the more efficient financial partner for opaque firms? In other words, will these opaque businesses be rationed or penalized if they choose to deal with hierarchical bank? ».

In the same logic, even before the theoretical paper of Stein, a set of empirical studies, such as Nakamura (1994), Berger and Udell (1996), Strahan and Weston (1996) etc. showed that small banks invest a large part of their assets to lend to small and medium

⁷ The theoretical framework is the theory of the firm. (Williamson (1988), etc.)

⁸ As we said before, soft information is the result of physical interactions between the firm's representative and his loan officer.

businesses. Moreover, large complex institutions prefer standard transactions and are less likely to be engaged in long term relationships. More recently, Brickley, Linck and Smith (2000) argue that large banks are the major actors in big agglomerates with large borrowers. Small banks are more active in rural regions. On the other hand, Berger, Rosen and Udell (2002) examined how the market size and structure affects the credit supply for small and medium firms, in the context of banking consolidation. Their results showed that big banks have more expertise in transactional lending than small ones. That doesn't necessarily mean that they cannot deal with opaque firms, because there are some particular forms of arm's length lending, adapted to their structure, like leasing, mortgaged loans, and more recently loans based on credit scoring. However, they also find that the presence of small banks in the market improves the credit supply to SME.

An alternative explanation of the relationship between the bank's and its customer's size could lie on the principle of diversification. In other words, the small banks cannot lend or be engaged with large amounts of loans for prudential reasons.

Another set of empirical studies was interested in the technologies used by the banks for their decision-making in loan approval. Cole, Goldberg and White (2003) analyze the differences that might exist in the decision-making processes between the large and the small banks. The former tend to use traditional methods based on quantitative data drawn from the financial statements like the scoring, whereas the latter, smaller and unable to set up such techniques, use more subjective criteria based on the characteristics of the borrowers and the personal interactions between the borrowers and their loan officers. These results confirm the arguments mentioned above, concerning the type of the information, soft or hard, used in the decision-making processes of the banks.

In addition, following the paper of Stein (2002), many authors tried to examine the various empirical implications of this model. These studies analyze, inter alia, the determinants of the duo (bank/SME). We consider particularly this part since it is close to our subject. Berger, Klapper and Udell (2001) tested a set of main and secondary assumptions. The purpose of their paper is to analyze and describe the credit relationships between the banks and the companies on the Argentinean market. Their main assumptions rise directly from Stein's model. The results obtained tend to confirm the theoretical hypothesis. Indeed, large banks have more difficulty dealing with soft information and thus in granting relational

financing. In addition, foreign banks are less likely to lend to the opaque companies than the local banks. These foreign banks are generally large and headquartered at a substantial distance from local relationship borrowers. Their organizational structure is thus rather hierarchical, and they are more likely to behave, according to the theory, like national centralized bank, in granting transactional financing. Berger, Miller, Petersen, Rajan and Stein (2002) examine more directly the choice of the bank by the small and medium sized firms. Their tests were realized on the NSSBF database of 1993. They find that the large banks lend in priority to large companies with good financial track records, and that small banks provide funding to riskier projects. On the other hand, SME which borrow from large banks are more likely to pay their trade credit late, they are thus rationed. This means that their choice was not suitable to their organizational and financial structure.

3. Data and econometric tests:

3.1. Data:

From the field “main bank” of the database DIANE⁹, we identified a set of couples bank/SME. This information mentions, indeed, the name of the bank in which the firm’s capital is deposited. We voluntarily restricted the companies created since less than 5 years from our sample. This choice enables us to reduce the potential shifts between the registered bank and the real one, because bank’s changes are less likely to happen at the first business’s year, and on the other hand, this choice permit to focus on the most opaque projects for which the commitment risk is more obvious. Indeed, several studies realised by the INSEE¹⁰ show the existence of a decreasing link between the age of the company and its probability of bankruptcy. For example, the tables of the French economy (edition 2005-2006) pointed out that 50.8% of the firms created in 1998 survive up to 5 years whereas 63.4% of these firms survive up to 3 years. We also excluded from our selection the companies operating in the agricultural, real-estate and financial sectors, because of their particular accounting characteristics. This enables us to identify 6 258 SME working with 182 different banks. The companies of our sample are distributed as follows: 31% in the services, 27% in the trade, 22% in industry, 11% in the construction industry and 9% in transport. The largest work in

⁹ DIANE : Disque pour l’ANalyse Economique, edited by Bureau van Dijk (92, rue de Richelieu 75002 PARIS)

¹⁰ INSEE : Institut National de la Statistique et des Etudes Economiques (National institute of statistics and economic studies).

manufacturing, the less risky in the construction, the less rationed in the trade; the smallest, the riskier and the financially constrained (rationed) in the services. Those working in the trade sector know the greatest dispersion of size; and those working in the services have the greatest variability of risk and financial difficulties. Table 1 shows these various statistical elements. The data relative to companies are crossed with the characteristics of the banks that are extracted from Bankscope¹¹.

3.2. Econometric model:

In this research, we ask about the existing adequacy between the informational quality of the companies and their choice of main bank. Do opaque SME tend naturally towards a financial intermediary that has an organisational structure able to provide relationship lending? To do this, we model the determinants of their association through a number of regressions, whose dependent variables are measures of the adoption by the financial institution of a decentralised structure, and the explanatory variables are measurements of opacity, credit rationing, and other control elements. This enables us to test the following assumptions:

H₁: The probability that a firm choose a decentralized main bank increases with its informational opacity.

H₂: The opaque firms that have hierarchical main banks are more likely to be credit constrained than those who have decentralized banks.

If these hypotheses are verified, this means that opaque firms will naturally seek for the decentralized bank's services, especially relationship lending, because of the bank's comparative advantage in reducing the asymmetric information's problems. If they do not, they will be more likely credit constrained. These arguments as well as the definition of the proxies used in this study are summarized in Table 2.

¹¹ Bankscope edited by Bureau van Dijk (92, rue de Richelieu 75002 PARIS)

3.2.1. Dependent variables :

In order to estimate the organizational form of the main bank, we start by proposing a classical measure, the SIZE of this bank, which is measured by the logarithm of the bank's total assets. Centralized financial intermediaries, that have necessarily adopted transactional methods to manage their risk, based on the diversification principle, have to deal with large customers. All other things being equal, we expect a negative relationship between the bank's size and the informational opacity of the firm, and a positive relationship with credit rationing. The most opaque firms should be oriented in priority toward small banks, the only ones able to provide them the relationship financing they need, and those engaged with large banks should be credit constrained. The suggested econometric model, which specification is presented in equation(1), is estimated by the ordinary least squares.

$$\ln(\text{bank's total assets}) = \alpha + \beta_1 \text{ opacity} + \beta_2 \text{ rationing} + \beta_3 \text{ control} \quad (1)$$

On the other hand, the relationship between the bank's size and its organizational structure is not always obvious. If we take the German case for example, we notice that the main relationship lending suppliers, the « Hausbank », are all large financial institutions. That's why we propose two additional variables as a complement to our analysis:

- Decent: a dummy variable equal to one if the bank has a decentralized structure, coded according to a revised classification proposed by the 1985 banking law.
- PERS/TA: a variable representing ratio of personnel expenses over total assets.

The first complement offers a qualitative vision for decentralization. We consider as decentralized banks the regional AFB¹² banks, the mutual banks and the “*Caisses d'Epargne*”¹³, as opposed to the National AFB banks and foreign banks, which have hierarchical structure. The descriptive statistics show that our bank sample is composed in the following way: 29% have centralized structures and 71% decentralized. The mutual banks are the more prevalent in the sample; they represent 40% of the total.

¹² Association Française des Banques : French bank association that includes all SA banks. We can call them Commercial Banks.

¹³ The “*Caisses d'Epargne*” are very close to mutual banks in their management and organisation. Their main customers are originally private individuals, but they have now also corporate customers.

Table 3 presents a description of the sample banks characteristics. First, we notice that centralized banks are significantly larger than their decentralized homologues. The biggest of the sample are BNP Paribas and Societe Generale as well as foreign banks, particularly the Deutch Bank. The mutual banks are the smallest, since their divisions are organized as local banks. With regional banks, they have the smallest ratio of « Provision over total assets », which means that they select their commitments better than others, but the leverage ratio shows that they have more debt than the average, contrary to foreign banks. They also have a lower ROE and a higher ROA. The ratio of “personnel expenses over total assets” is the highest for regional banks and “*Caisses d’Epargne*” that use more employees for credit granting, and the lowest for *BNP Paribas* and *Société Générale*. The latter observation is explained by the existence of economies of scale that those large banks have in credit processing.

The second part of Table 1 presents the distribution of banks’ market shares in the different industries. *BNP Paribas* and *Société Générale* are the main banks of 26% to 30% of the sample firms relative to their activities, the other national AFB banks are the main banks of 7% to 10% and foreign banks those of 5% to 11%, with a maximum in the services industry. Regarding decentralized banks, the regional institutions are the main partners of 15% of services firms and 25% of those in transportation, the mutual banks between 31% for transportation sector and 38% for the trade and the “*Caisses d’Epargne*” between 1% and 2% depending on the firm’s industry.

We expect a positive relationship between the customer’s opacity and the likelihood that his main bank has a decentralized organizational structure and a negative link with credit rationing. The most opaque firms searching for relationship lending, should be oriented in priority towards decentralized financial institutions which are the most able to provide this type of financing, as we explained above. If they choose to contract with centralized bank, they should more often be credit constrained. To test these expectations, we propose a Logistic regression model estimated by the maximum likelihood. The specification is presented in equation (2).

$$\text{Prob}(\text{Decentralized} = 1 | x_i) = \frac{e^{\beta'x_i}}{1 + e^{\beta'x_i}} \quad (2)$$

$$\beta'x_i = \alpha + \beta_1 \text{ opacity} + \beta_2 \text{ rationing} + \beta_3 \text{ control}$$

The second suggested complement of our analysis proposes a new quantitative vision for the main bank's organizational structure. We use the ratio of « Personnel expenses over total assets ». Decentralized banks, providers of relationship lending, need more employees to offer the same quantity of loans than transactional hierarchical banks. We think therefore that this variable is a good proxy for the organizational nature of the bank. As for the previous analysis, we expect a positive relationship between the customer's opacity and the ratio of « personnel expenses over total assets », and a negative connection with rationing intensity. The intuition behind this argument is that opaque firms will go first towards financial partners that are capable to deal with their particularity and to provide them relationship financing, through more monitoring which requires more human capital. If these firms were not able to have such main bank, they are more likely to be liquidity constrained. The suggested regression model, estimated by the ordinary least squares, is specified in equation (3).

$$\frac{\text{Personnel expenses}}{\text{Total assets}} = \alpha + \beta_1 \text{ opacity} + \beta_2 \text{ rationing} + \beta_3 \text{ control} \quad (3)$$

3.2.2. Explanatory variables:

The first component of our tests is the firm's informational opacity. Given that this concept is difficult to measure directly, we suggest estimating it through two proxies. The opacity factors permit us to highlight the relative advantage to of setting up relationship lending, in order to reduce the informational asymmetries problems. We suggest the firm's size and its legal structure. We didn't use the firm's age, another classical proxy of opacity, because we have limited our sample to firms that are less than 5 years old. Moreover, the choice of the main bank occurs at the firm's creation, thus, we think that the use of this proxy is not adapted to our sample.

The firm's size is measured by the logarithm of its total assets. The idea is that the larger the company is, the more considerable are its assets and its various actions are more consequent and easier to observe. In addition, the credit quantity needed is significant and allows economies of scale in information and monitoring costs. The firm's size is thus negatively related to its informational opacity. We expect then a positive relationship between firm's and bank's size, negative with the likelihood that the main bank has a decentralized

organizational structure and negative with the ratio of “Personnel expenses over total assets”. The possible colinearity problems relative to this variable are naturally controlled in our regressions through the condition number.

Regarding the firm’s legal form, we suggest a dummy variable, SA, taking the value 1 if the firm is an « *anonymous company* ¹⁴», and 0 otherwise. The publicity obligations are much more important for these firms than others, particularly concerning the certification of their financial statements. They are thus more transparent than their peers. The SA variable is also negatively related to customer’s opacity. We expect then the same relationships between SA and our dependent variables than those predicted for firm’s size.

For the second component of our analysis, the credit rationing, we choose among all the suggested measures in previous literature, the ratio of « Taxes over total debt » used in the paper of DeBodt, Lobeze and Statnik (1999). The principle of this proxy lies in the indirect observation of the bank credit rationing’s consequences through the use of other substitution credit that are more costly. Here it is the debt to government (the taxes). The sample firms’ youth limits the alternatives. Only public authorities are able to support this uncertain commitment. We are however aware of this indicator’s limits. We know that this ratio’s intensity is closely related to the industry sector (VAT rate) and the firm’s size (the corporation tax scale); we control for these factors by including them in our regression. The rationing intensity increases with this ratio; we expect then a positive relationship between this ratio and the main bank’s size, negative in the same conditions with the likelihood that the main bank is decentralized and the ratio of “personnel expenses over total assets”.

The last component of our analysis concerns the control factors. The previous literature as well as a set of semi-directive interviews conducted with financial managers and CEO of various small and medium sized firms have highlighted some determinants of the main bank’s choice, different from its organizational structure. The first one is the apparent financial risk which is measured here by the Conan-Holder score based on the company’s financial statements. The calculation formula is presented in annex 1. As we explained above, Centralized banks are larger than others; they are thus more able to manage and deal with

¹⁴ “Société anonyme” in French. We can also translate it as “share company”. This legal form is equivalent to “public limited company” in UK. We can also talk about “Joint Stock Company” or “corporation”. But due to differences in the legal conditions and terms through countries, we choose to retain the French nomenclature.

greater apparent risks since they base their risk management strategy on diversification. Indeed, the potential loss on a financially distressed customer is easily compensated by the success of other clients. We expect then a positive relationship between the main bank's size and the customer's risk, negative with the likelihood that the main bank has a decentralized organizational structure and with the ratio « Personnel expenses over total assets ».

The firm's industry is also an important determinant of the main bank's choice. The bank's specialisation in a given industry allows it to develop a comparative advantage in the processing of client's credit demands in the relative sector. These firms will then go naturally and in priority towards these financial intermediaries. Boot and Thakor (2000) have already considered these two factors in their examination of the competition evolution of the banking industry. In our study, we use a set of dummy variables related to the different sample firms' activities.

The last control factor considered in our regressions is the market where the firm operates. In reference to studies by Ongena and Smith (2001) and Farinha and Santos (2001) on the bank's changes, the firm's market is an important determinant of financial intermediary's choice. We have thus encoded, from the market field in DIANE, a dummy variable equal to one if the firm works on a local or a regional market, and zero if it is on a national or international scale. We expect a negative relationship between this variable and the main bank's size, positive with the likelihood of having a decentralized financial partner and with the ratio "personnel expenses over total assets". Descriptive statistics are summarized in table 4.

4. Results

Table 5 shows the empirical results of our first regressions realized on the bank's size. The first column presents the entirety of the variables and in the rest we proceed by eliminating some variables to test the robustness of our results. According to our predictions, the factors measuring the informational transparency¹⁵ are increasing with the main bank's size: the log of the firm's total assets is positively and statistically significant at the 1% level to the log of the bank's total assets. Moreover, SA firms have bigger main banks, which are, according to previous literature, hierarchical banks. Our first hypothesis seems to be verified.

¹⁵ To test the hypothesis related to informational opacity, we use as we mentioned above indicators measuring the informational transparency.

Rationing presents a positive coefficient with statistical significance at the 1% level. This means that firms with large main bank pay their taxes later than the others. This delay can be interpreted as a financial stress signal. This result is also consistent with our prediction (Hypothesis H₂).

The apparent financial risk, measured by the Conan-Holder scoring method, doesn't seem to be an efficient explanatory factor of the main bank's size. But the firm's industry is more relevant. Businesses working in manufacturing and trade choose smaller banks: the corresponding coefficient is negative and statistically significant. This result is supported by the calculations of Table 1 which shows that 33% of the manufacturing firms and 38% of trading companies work with mutual banks which are the smallest in the sample. This is consistent with the industrial specialisation of banks highlighted in the previous section (Boot and Thakor, 2000). On the other hand, the fact of operating in a local or regional market has no significant relationship with the main bank's size.

The significant result obtained for the variable SA proves the existence of two different regimes according to whether the firm is a SA or not. In order to examine any possible difference, we have run the regression on two subsamples: the first one including the SA firms and the second one the rest of the firms. Results are presented in the second and the third columns (regressions 3 and 4). Concerning our main variables, opacity and rationing variables, there is no apparent difference between the two groups. But results are obviously different regarding industrial specialisation of banks. The manufacturing and trade coefficients are not significant anymore when the firm is not a SA. This result is supported by Table 1's calculations since 66% of manufacturing firms and 52% of trade firms are SA.

In order to control for colinearity problems, we run regression 4 without the firm's size. As a proxy for informational opacity, the removal of this variable reinforced the effect of the SA variable whose coefficient increases meaningfully and become more statistically significant (P-value decreases from 8% to 1%). On the other hand, the rationing variable's sign becomes negative, indicating that firms with bigger main banks are less rationed than their peers. Size's withdrawal from our regression has certainly limited the informational opacity effect. Concerning industrial dummies, no significant changes are worth mentioning. The coefficient of Market dummy becomes clearly significant at the 5% level. Its negative sign indicates that firms with national or international scope tend towards bigger main banks.

As explained above, the next regressions are run to test the robustness of our results. For logistic analysis, the dependant variable is the probability that the main bank has a decentralized organizational structure. We first conducted bi-variate analyses that are summarized in Table 6. We can note that the mean size of a decentralized bank's customers is quite higher than that of a hierarchical bank's customers (16 billion euros for the first group against 3 billion for the second). Firms with decentralized main banks have a higher score than others and thus better financial quality. But they have more financial restrictions, particularly in credit availability (the rationing variable is higher). This result is comprehensive since we don't control for informational opacity. We think that a decentralized bank's customers are the most opaque ones: 44% of them are SA versus 70% for a centralized bank's clients. In addition, firms with decentralized banks operate more often in local or regional markets (66%). Concerning the firm's distribution by industry, decentralized banks work more with firms in the services industry (33.62%) that are the smallest in the sample, versus 25,7% for the centralized ones. Note that these firms represent only 31% of the full sample.

This bi-variate analysis highlighted some important relationships between our dependant variable and the theoretical determinants. However, we can not conclude without the multivariate regressions, results from which appear in Table 7. The first column summarizes the results of the entirety of the econometric estimated model and shows that our main variables, those relative to the tested hypotheses, are significant. The coefficient of the firm's size variable is negative and significantly different from zero at the 1% level, indicating that opaque firms choose a decentralized main bank. In the same way, the fact of being a SA decreases the likelihood of working with a decentralized bank. Concerning credit rationing, the coefficient is also negative and statistically significant at the 1% level. A decentralized bank's clients are, all other things being equal, less financially constrained, contrary to what the bi-variate analysis has shown. We can explain this change in the relationship between these two phenomenons, rationing and having a decentralized bank, by the fact that opacity factors are now controlled. We can say that our hypotheses are supported once again. Indeed, opaque firms are more likely to have a main bank with a decentralized organizational structure. If they choose hierarchical banks, they will be more probably limited in bank credit. Of our control variables, Score's coefficient, measuring financial apparent risk, is now positive and statistically significant, indicating that decentralized banks are more likely to

have riskier customers, which is consistent with calculations of Table 6. Once again, the bank's industrial specialisation's hypothesis seems to be relevant, since manufacturing, services and trade coefficients are significant.

As for the first regressions series, we have examined separately the two sub-samples of firms: SA firms and non SA ones. For all firms, the relationship between our dependent variable and size remains negative and statistically significant. Rationing intensity is no longer significant for the SA sub-sample. This result seems logical because these firms are the less opaque ones and thus the less likely to be rationed and to need relationship lending, in order to resolve informational asymmetries problems. For the other sub-sample containing the most opaque firms, the rationing coefficient is negative and significant, indicating that having decentralized main banks for opaque firms limits credit rationing. In other words, informationally opaque businesses that choose to deal with hierarchical financial partners are more likely to be limited in credit; this affirmation is consistent with our hypothesis H₂. The relationship between apparent risk and a decentralized bank's choice is not significantly different from zero when the firm is a SA but clearly positive and statistically significant when it is not a SA. To summarize, we can say that the riskiest and the most opaque firms will go in priority toward decentralized banks, if not, they will be exposed to financial problems, particularly credit rationing.

Concerning the bank's industry specialisation, we notice that it is different between the SA firms and the others, except in the services industry. Firms in manufacturing, services and trade choose decentralized banks when they are SA. In the non SA sub-sample, firms choose in priority decentralized financial partners when they are in the services industry and hierarchical ones when they are in the construction industry. The relationship with the market is still not significant but the coefficient is of opposite sign in the two regressions, indicating that SA firms that choose decentralized banks are less implicated in local market. However, without statistical significance, we remain reserved concerning this result.

When we remove the firm's size from the regression (the last column of the table), the coefficient of the dummy SA remains negative and statistically significant, but it is multiplied by 3, since all opacity's effect is captured only by this one variable. On the other hand, Rationing's sign becomes positive, indicating that firms with a decentralized main bank are more limited in credit than their peers. The control for opacity being non-existent in our

bi-variate analysis, we conclude that size's suppression from the regression leads to sign's reversal and to a bad specification of the model. The score coefficient is no longer significant, and for industry's dummies, the only significant relationships are those with Services and Trade, and they are positive. But the most important difference is the relationship between our dependent variable and the Market dummy that becomes significantly positive. It seems therefore that decentralized banks do well their work as local banks since their customers are more present on local and regional markets. Due to the strong tie between this variable and the firm's size, its effect on the probability of having a decentralized bank is certainly hidden when we include the size variable in the regression.

The last set of regressions is presented in Table 8. The dependent variable is now the ratio « personnel expenses over total assets »; we will call it from now on PERS/TA. The idea is that decentralized banks, which mainly provide relationship financing, need more human capital in order to grant the same credit quantity as other banks, all other things being equal. In the same logic as previous tables, we have run four different regressions. The first one represents the model with all the variables. According to our predictions, the largest firms choose main banks with smaller ratio PERS/TA. There is a significant and negative relationship between the two variables. But concerning the business's legal structure, although the effect is negative, having a SA structure is not significantly related to the dependent variable. Regarding the second hypothesis, rationing intensity is negatively and significantly related to the ratio PERS/TA, indicating that decentralized banks clients are the less likely to be limited in funds. The control variable « apparent risk », measured by the Conan-Holder scoring, has no significant effect. For industry's dummies, manufacturing and services firms are more likely to deal with banks that use more human capital. Additionally, Table 1 shows that in manufacturing sector, firms have mainly mutual banks (33%), and more generally 58% of these firms choose to work with decentralized banks. Moreover, 35% of services firms are with mutual banks and 52% with decentralized ones.

The Market dummy has no significant effect on the dependent variable. Its effect is certainly captured by the size variable, since they are correlated. As for the examination of the sub-samples of SA and non SA firms, the signs of the opacity variables coefficients are the same as in the general context, and they are all significant. It is only on the bank's industrial specialisation and the local aspect of the market that results are different. The SA firms that are in manufacturing, trade and services, are more likely to choose banks with more personnel

expenses, all other things being equal. Just notice that banks using more human capital to offer the same financing quantity are decentralized banks. For the other sub-sample, firms operating on local markets are more likely to be oriented toward banks using more personnel.

The suppression of firm's size from the regression (see regression 4 of the table), leads to the reinforcement of the effect of the variable SA, which becomes significant at the 1% level. Negative sign indicates that being a SA, and therefore a transparent firm, leads to the choice of banks with less human capital, all other things being equal. As for rationing, the coefficient sign becomes positive, indicating that firms who choose banks with more personnel are more limited in credit than the others. This result is consistent with the conclusion drawn from the previous table that relates this sign's change to the decrease of informational opacity's effect in the regression model. For our control variables, the apparent financial risk has no significant effect on the dependent variable. The fact that the firm belongs to the Manufacturing industry is the only variable related significantly to the weight of personnel expenses in the bank with regard to the credit quantity offered. And finally, the market dummy is positively related to the dependent variable at the 5% level, indicating that firms working on local markets choose more banks with more personnel expenses. To summarize, all our results seem to be consistent with each other and consistent with our predicted hypotheses.

5. Conclusion :

In this paper, we conduct an empirical investigation on the explanatory components of the SME's choice of its main bank. The recent literature on relationship banking shows that banks can be specialized, according to their organisational structure, in different kind of financing. Therefore, firms are choosing their banks according to their needs for relational or transactional financing. More precisely, Stein (2002) affirms in his model that because of existing differences in their organisational structure, banks are not able to produce and deal with all types of information, which can be different according to the firm's characteristics, and in consequence have to readapt their financing to their decisional technologies. On the basis of these theoretical arguments, we propose to test two hypotheses. First, we relate the firm's informational opacity and thus its relational financing needs with the choice of a decentralized bank. If this opaque firm chooses to work with a hierarchical bank unable to produce adequate information for a decision-making, it will then risk to be rationed in credit.

The results obtained from the different regressions seem to support our two hypotheses and are not contradictory with previous studies. In fact, several empirical investigations test, on the basis of this theory, the relationship between the banks' organizational structures and their customer's characteristics. Berger et al. (2002)'s paper realised on the NSSBF data is the closest contribution to ours. However, we set up a complement to this literature by proposing different measures of the decentralized nature of the main bank. In addition to size, we consider the probability of the main bank to be decentralized. We classify in this category mutual and regional banks, and among hierarchical ones, national and foreign banks. And finally, we take the ratio « personnel expenses over total assets ». For the same amount of credit provided, decentralised banks need more labour than hierarchical ones to grant relational financing which require soft information. These different measurements, although independent, give consistent results, which increases the plausibility of our hypotheses.

Considering these findings that highlight the importance of the main bank's organizational structure relative to its customer's characteristics and the existence of a financial constraint, credit rationing, if the organizational structure is not the most efficient, it is essential in the current financial consolidation environment to maintain decentralized banks in the market. Therefore, mergers and acquisitions between banks and other financial institutions must be controlled in order to preserve the comparative advantage that decentralized structures have, especially concerning the small and medium sized businesses financing. As an extension to this paper, it will be interesting to examine the consequences of the consolidation in the banking industry, to see if there is really a decline in the number of decentralized banks in the market and if there is a decrease in the SME's financing.

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Table 1: Distribution of Sample firms by industry

The table below presents the industrial distribution of firms in the sample. There are two types of data: quantitative and qualitative. For the first, we document the minimum, the maximum, the mean (in bold), the median (between brackets) and the standard deviation for each variables. For the second, the qualitative ones, we present the number and the frequency of firms in each class.

	Manufacturing	Services	Trade	Construction	Transportation
Number of firms (6258)	1382 22%	1952 31%	1704 27%	678 11%	542 9%
Total assets of the firm	6 374 469 138 050 9 331 173 (2 530 599) 24 902 887	7 180 293 336 500 693 161 (1 214 110) 74 526 010	2 580 3 881 046 000 7 928 850 (2 173 820) 94 951 140	9 420 211 440 650 4 387 830 (1 473 560) 11 637 370	122 340 183 059 000 4 400 890 (1 530 800) 13 943 870
Apparent risk:	-232,46	-2 822,61	-73,94	-27,32	-111,74
Score Conan	82,18	171,28	123,31	66,63	74,63
Holder	11,34 (11,79)	10,54 (12,85)	12,11 (11,05)	12,92 (12,44)	12,31 (12,23)
	15,65	68,63	13,62	8,58	12,23
Rationing:	0	0	0	0	0
Taxes/total debt	1,0000 0,2456 (0,2006) 0,1810	0,9928 0,4480 (0,4338) 0,2732	0,9605 0,1880 (0,1437) 0,1533	0,8965 0,2755 (0,2664) 0,1303	0,9554 0,3581 (0,3398) 0,1879
SA	916 66,28%	929 47,59%	894 52,46%	266 39,23%	265 48,89%
Market	642 46,45%	1199 61,42%	1227 72,01%	543 80,09%	284 52,40%
Identified main bank (4552 firms)	1273 28%	1026 22,5%	1193 26,2%	623 13,7%	437 9,6%
BNP SG¹⁶	333 26%	284 28%	307 26%	160 26%	129 30%
National bank	99 8%	98 10%	79 7%	44 7%	33 8%
Foreign bank	101 8%	111 11%	81 7%	33 5%	28 6%
Regional bank	292 23%	153 15%	240 20%	149 24%	108 25%
Mutual bank	419 33%	360 35%	457 38%	224 36%	134 31%
« Caisse d'Epargne »	29 2%	20 2%	29 2%	13 2%	5 1%

¹⁶ BNP SG refers to the two biggest French banks : “BNP Paribas” and “Société Générale”

Table 2: Synthesis of our econometric modelisation

The choice between centralized and decentralized bank	Informational opacity or risk	Rationing	Other explicative factors or control variables
Bank's size	The firm's size ;	Taxes over total debt	Financial risk ;
Dummy decentralized	“anonymous company” SA (accounts certification)		specialisation of banks ;
Ratio : personnel expenses over total assets			Market ;

Summary of the hypotheses

H1: The probability that a firm choose to deal with a decentralized main bank increases with its informational opacity.

H2: The opaque firms that have hierarchical main banks are more likely to be rationed than those who have decentralised ones.

Table 3 : The characteristics of the sample banks.

This table summarizes the sample banks' characteristics relative to their nature. It contains two subdivisions. The first distinguishes between the decentralized and centralized nature of banks. The second classifies sample banks into 6 different categories: BNP Paribas/Société Générale, national banks, foreign banks, regional banks, mutual banks and "Caisses d'Epargne". To begin, we report the number of banks in each class and their percentage in the global sample. We then calculate the mean (in bold), the median (between parentheses), the standard deviation, t-student and p-values corresponding to means difference tests realised. The latter differs relative to the subdivision type. For those including two classes, centralized/decentralized, it is a question of comparing the means of each sub-sample. For those including six categories, each mean is compared individually to the mean of the total sample.

	Centralized banks			Decentralized banks			Total sample
	BNP and SG	National banks	Foreign banks	Regional banks	Mutual banks	« Caisses d'Epargne »	
Number %	2 1%	18 10% 52 29%	32 18%	37 20%	73 40% 130 71%	20 11%	182
Total assets	611 488 000 (611 488 000) 141 021 133 7,819*** 0,000	32 214 638 (1 263 800) 72 735 468 0,070 0,944	88 818 158 (6 126 950) 178 884 154 2,576*** 0,010	3 753 321 (1 132 400) 8 196 836 1,553 0,121	7 722 687 (5 730 400) 9 480 840 1,856* 0,064	9 698 600 (8 555 700) 5 704 990 0,887 0,375	30 448 470 (4 952 350) 104 281 126
		89 327 318,40 (3 856 550) 182 887 281			6 896 931 (4 984 550) 8 840 265 3,248*** 0,002		
Provision over total loans	0,00022 (0,00022) 0,00073 0,411 0,680	0,00929 (0,00314) 0,01338 1,165 0,245	0,00233 (0,00210) 0,00686 1,366 0,173	0,00461 (0,00417) 0,00749 1,748* 0,081	0,00817 (0,00297) 0,04163 2,491** 0,013	0,00220 (0,00184) 0,00202 1,302 0,194	0,00587 (0,00282) 0,02799
		0,0046 (0,0021) 0,0101			0,0063 (0,0030) 0,0316		
					0,507 0,612		
Leverage	0,9685 (0,9685) 0,0024 0,411 0,681	0,8802 (0,9333) 0,1542 1,235 0,217	0,8850 (0,9471) 0,2069 1,648* 0,100	0,9399 (0,9429) 0,0255 1,772* 0,077	0,9070 (0,9018) 0,0292 2,491** 0,013	0,9346 (0,9340) 0,0120 1,302 0,194	0,9109 (0,9285) 0,1027
		0,9031 (0,9190) 0,1134			0,9141 (0,9328) 0,0984		
					0,005 0,996		
ROE	0,1425 (0,1425) 0,0094 0,411 0,681	0,0234 (0,0820) 0,1937 1,165 0,245	0,0831 (0,0865) 0,1668 1,366 0,173	0,1367 (0,1273) 0,1868 1,748* 0,081	0,0826 (0,0808) 0,0240 2,491** 0,013	0,0793 (0,0790) 0,0173 1,302 0,194	0,0889 (0,0855) 0,1239
		0,0622 (0,0897) 0,1750			0,0972 (0,0850) 0,1026		
					1,202 0,235		
ROA	0,00447 (0,00447) 0,00004 0,411 0,680	-0,01031 (0,00563) 0,05951 1,165 0,245	0,00477 (0,00520) 0,01182 1,366 0,173	0,00827 (0,00896) 0,00731 1,772* 0,077	0,00763 (0,00803) 0,00296 2,491** 0,013	0,00516 (0,00521) 0,00136 1,302 0,194	0,00545 (0,00676) 0,01942
		-0,00128 (0,00470) 0,03864			0,00754 (0,00683) 0,00464		
					1,440 0,158		
Personnel expenses over total assets	0,00624 (0,00624) 0,00134 6,829** 0,021	0,01632 (0,00650) 0,02438 0,501 0,626	0,01312 (0,01019) 0,00876 -0,594 0,559	0,01809 (0,01838) 0,00797 2,420** 0,019	0,01506 (0,01320) 0,00550 0,691 0,491	0,00912 (0,00911) 0,00085 7,029*** 0,000	0,0147 (0,0130) 0,0091

	0,0149 (0,0132) 0,0065	0,0137 (0,0077) 0,0149	
		0,4805 0,6336	

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels.

Table 4 : Descriptive statistics

	Minimum	Maximum	Mean	Median	Standard deviation
Total firm's assets	2,58	3881046	7241,23	1740,16	66031,74
Score	-2822,60	171,27	11,54	12,045	39,94
Rationing	0	1	0,3060	0,2452	0,2302
SA	0	1	0,5226	1	0,4995
Market	0	1	0,6223	1	0,4848
Manufacturing	0	1	0,2209	0	0,4149
Services	0	1	0,3119	0	0,4633
Trade	0	1	0,2722	0	0,4451
Construction	0	1	0,1082	0	0,3107
Transportation	0	1	0,0866	0	0,2811

Table 5 : The Size of the main bank

This table summarizes the results of the OLS regressions on the determinants of the main bank's size.

$$\ln(\text{bank's assets}) = \alpha + \beta_1 \ln(\text{firm's assets}) + \beta_2 SA + \beta_3 \text{Rationing} + \beta_4 \text{Score} + \beta_5 \text{SECT} + \beta_6 \text{Market} \quad (4)$$

The dependent variable is the logarithm of bank's total assets. The explanatory variables are all related to the firm's characteristics. We have : the firm's size measured by the logarithm of total assets, SA a dummy taking the value 1 if the firm is a "share company", rationing measured by the ratio taxes over total debt, Score which is the value of the Conan-Holder score ; series of dummies corresponding to the different industries : manufacturing, services, trade and construction, transportation being the reference group; and finally a Market dummy which takes the value 1 when the firm operates on a local or a regional market, and 0 if it is a national or international market.

	Regression 1 Log (total bank's assets)	Regression 2 Log (Total bank's assets) SA	Regression 3 Log (Total bank's size)/ non SA	Regression 4 (without firm's size)
Intercept	13,409*** 50,530 0,000	13,363*** 36,370 0,000	13,804*** 32,946 0,000	17,095*** 125,970 0,000
Log (Total firm's assets)	0,463*** 16,010 0,000	0,498*** 13,534 0,000	0,399*** 8,345 0,000	
Dummy SA	0,129* 1,760 0,079			0,578*** 8,318 0,000
Rationing	0,647*** 3,381 0,001	0,641** 2,357 0,018	0,647** 2,400 0,017	-0,368** -1,985 0,047
Score	-0,000499 -0,715 0,475	-0,000358 -0,487 0,626	-0,00276 -0,823 0,411	-0,000592 -0,826 0,409
Manufacturing	-0,372*** -3,098 0,002	-0,574*** -3,505 0,000	-0,0659 -0,373 0,709	-0,287** -2,329 0,020
Services	-0,0645 -0,526 0,599	-0,161 -0,950 0,342	0,03768 0,215 0,830	0,007658 0,061 0,952
Trade	-0,335*** -2,700 0,007	-0,520*** -3,060 0,002	-0,0958 -0,530 0,596	-0,277** -2,172 0,030
Construction	-0,161 -1,191 0,234	-0,236 -1,179 0,239	-0,0181 -0,099 0,921	-0,121 -0,869 0,385
Dummy Market	-0,00195 -0,029 0,977	0,06465 0,740 0,459	-0,124 -1,132 0,258	-0,163** -2,359 0,018
Fisher	40,643***	25,630***	9,789***	12,954***
Adjusted R²	0,073	0,067	0,038	0,021
Condition number	24,070	23,137	24,429	10,149
N	4548	2766	1782	4548

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels

Table 6 : Bi-variate analysis- Centralized/decentralized bank

We present here a decomposition of the sample firms' characteristics according to whether their main banks are centralized or hierarchical. The table is divided into two parts. The first one includes analysis of the quantitative elements: the size (total firm's assets), apparent financial risk (Conan-Holder score), and the rationing (the ratio fiscal and social debt over total debt). For each one, we calculate the mean and the median (between parentheses) in the sub-samples and realise a mean's difference test. The second part shows relative frequencies in the sub samples, for each different qualitative variable.

Variables	Centralized bank	Decentralized Bank	t-Student	p-value
Total firm's assets	16 017 552 (3 777 543)	3 358 415 (1 282 528)	4,708	0,000***
Score	9,68 (12,04)	12,385 (12,061)	1,707	0,087*
Rationing	0,26 (0,21)	0,32 (0,26)	10,302	0,000***
SA	69,9%	44,4%		
Market	54,2%	65,8%		
Manufacturing	27,79%	19,56%		
Services	25,70%	33,62%		
Trade	24,40%	28,48%		
Construction	12,20%	10,23%		
Transportation	9,91%	8,11%		

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels

Table 7 : Logistic regression of the main bank choice

The results of the maximum likelihood estimations of the logistic model are reported in this table.

$$\text{Prob}(\text{Decentralized} = 1|x_i) = \frac{e^{\beta'x_i}}{1 + e^{\beta'x_i}} \quad (6)$$

$$\beta'x_i = \alpha + \beta_1 \ln(\text{firm's assets}) + \beta_2 SA + \beta_3 \text{Rationing} + \beta_4 \text{Score} + \beta_5 \text{SECT} + \beta_6 \text{Market}$$

The dependent variable is the probability that the main bank has a decentralized organisational structure. The explanatory variables are all related to the firm's characteristics. We have : the firm's size measured by the logarithm of total assets, SA a dummy taking the value 1 if the firm is a "share company", rationing measured by the ratio taxes over total debt, Score which is the value of the Conan-Holder score ; series of dummies corresponding to the different industries : manufacturing, services, trade and construction, transportation being the reference group; and finally a Market dummy which takes the value 1 when the firm operates on a local or a regional market, and 0 if it is a national or international market. .

	Regression 1 Dummy decent	Regression 2 Decent /SA	Regression 3 Decent /no SA	Regression 4 Dummy decent (without firm's size)
Intercept	5,721*** 448,652 0,000	4,789*** 183,222 0,000	6,646*** 199,844 0,000	0,685*** 32,466 0,000
Ln (Total firm's assets)	-0,644*** 447,853 0,000	-0,582*** 246,900 0,000	-0,749*** 196,157 0,000	
Dummy SA	-0,320*** 21,168 0,000			-0,951*** 238,961 0,000
Rationing	-0,583*** 11,309 0,001	-0,185 0,627 0,428	-1,084*** 17,260 0,000	0,845*** 30,600 0,000
Score	0,007*** 10,323 0,001	0,001 0,292 0,589	0,014*** 19,316 0,000	0,002 1,162 0,281
Manufacturing	0,252** 4,784 0,029	0,416*** 7,851 0,005	-0,088 0,219 0,640	0,118 1,129 0,288
Services	0,495*** 19,476 0,000	0,462*** 9,644 0,002	0,507*** 8,151 0,004	0,400*** 13,649 0,000
Trade	0,549*** 22,149 0,000	0,688*** 20,399 0,000	0,305 2,677 0,102	0,505*** 20,205 0,000
Construction	-0,010 0,006 0,937	0,249 1,847 0,174	-0,335* 2,980 0,084	-0,075 0,350 0,554
Dummy Market	0,034 0,285 0,594	-0,043 0,311 0,577	0,146 1,701 0,192	0,236*** 15,231 0,000
% of correct predictions	73,8	66,4	82,5	69,6
Khi 2	993,176***	345,610***	323,214***	472,875***
-2L	6719,221	4080,207	2609,180	7239,522
N	6258	3270	2988	6258

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels

Table 8 : Personnel used for credit granting

This table shows the results of the OLS estimations of the following regression model.

$$\frac{\text{Personnel expenses}}{\text{total assets}} = \alpha + \beta_1 \ln(\text{total firm's assets}) + \beta_2 \text{SA} + \beta_3 \text{Rationing} + \beta_4 \text{Score} + \beta_5 \text{SECT} + \beta_6 \text{Market} \quad (5)$$

The dependent variable is the ratio « personnel expenses over total assets ». The explanatory variables are all related to the firm's characteristics. We have : the firm's size measured by the logarithm of total assets, SA a dummy taking the value 1 if the firm is a "share company", rationing measured by the ratio taxes over total debt, Score which is the value of the Conan-Holder score ; series of dummies corresponding to the different industries : manufacturing, services, trade and construction, transportation being the reference group; and finally a Market dummy which takes the value 1 when the firm operates on a local or a regional market, and 0 if it is a national or international market.

	Regression 1 Personnel expenses/total assets	Regression 2 Personnel expenses/total assets (SA)	Regression 3 Personnel expenses/total assets (no SA)	Regression 4 Personnel expenses/total assets (without firm's size)
Intercept	0,02239*** 24,746 0,000	0,02221*** 18,228 0,000	0,02219*** 14,800 0,000	0,0123*** 26,680 0,000
Ln (Total firm's assets)	-0,00127*** -12,896 0,000	-0,00132*** -10,811 0,000	-0,0012*** -6,978 0,000	
Dummy SA	-0,0000643 -0,258 0,797			-0,00130*** -5,535 0,000
Rationing	-0,00163*** -2,455 0,014	-0,00148* -1,624 0,104	-0,0019* -1,928 0,054	0,001179* 1,845 0,065
Score	0,000005287 0,238 0,812	0,00000035 0,153 0,878	0,00000606 0,521 0,602	0,000000958 0,423 0,673
Manufacturing	0,0009366** 2,302 0,021	0,001627*** 3,000 0,003	-0,00000714 -0,011 0,991	0,0007021* 1,692 0,091
Services	0,0007753* 1,862 0,063	0,00136** 2,407 0,016	0,0000244 0,039 0,969	0,0006021 1,417 0,157
Trade	0,0006898 1,634 0,102	0,001514*** 2,682 0,007	-0,000404 -0,629 0,530	0,0005426 1,259 0,208
Construction	0,0005256 1,149 0,251	0,000994 1,524 0,128	-0,000232 -0,357 0,721	0,0004424 0,947 0,343
Dummy Market	0,0001460 0,631 0,528	-0,000207 -0,717 0,473	0,000814** 2,072 0,038	0,0005811** 2,486 0,013
Fisher	24,767***	15,872***	7,836***	6,789***
Adjusted R²	0,051	0,047	0,035	0,012
Condition number	24,108	23,183	24,427	10,156
N	3947	2418	1529	3947

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels.

Annex 1. Conan-Holder scoring method

$$N = 24 R1 + 22 R2 + 16 R3 - 87 R4 - 10 R5$$

Where :

$$R1 = \frac{\text{EBITDA}^{17}}{\text{Total debt}}$$

$$R2 = \frac{\text{Permanent financing}}{\text{Total assets}}$$

$$R3 = \frac{\text{Current assets less inventories}}{\text{Total assets}}$$

$$R4 = \frac{\text{Financial charges}}{\text{Net turnover}}$$

$$R5 = \frac{\text{Personnel expenses}}{\text{Value added}}$$

¹⁷ EBITDA : Earning before interest, tax, depreciation and amortization.

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