

## **The Determinants of the Number of Banks: Empirical Results from French Small and Medium Business**

Rim Tlili\*

*For Small and Medium Business, the relationship with a bank is often the only way to obtain outside financing. In fact, SMB are known to be very opaque, so banks can solve this problem of asymmetric information by developing credit relationships. Theories of financial intermediation show that single bank relationship is most efficient according to delegated monitoring model. But in recent years, various SMB choose a multiple bank relationship. By borrowing from more than one bank, the firm can solve the hold-up banking problem. This paper focuses on the determinants of the number of banks by firms. We use these theories to formulate assumptions relative to firms' quality, firms' opacity and banking relationship. The empirical evaluation of these hypotheses conducted on a sample of 144 French SMB data during 2009 show that firm's opacity positively influences the number of banks whereas the duration of the main bank's relationship has a positive but no a significant effect on the number of banks. The hypothesis of credit rationing is also confirmed for the French case. In fact, firms exposed to credit rationing are characterized by a more important number of banks.*

**Keywords:** Small and Medium Business, Single Bank, Multiple Bank.

**JEL Codes:** G21. G32

### **1. Introduction**

Recently, an important number of research focus on the optimal number of bank relationships of Small and Medium Business. In fact, for this type of Business, the relationship with a bank is often the only way to obtain outside financing. Small and Medium Business are known to be very opaque, so banks can solve this problem of asymmetric information by developing credit relationships. Banks produce information about firms and use it in their credit decisions (Fama, 1985). Theories of financial intermediation show that single bank relationship is most efficient according to delegated monitoring model (Diamond, 1984). Firms should have a lower cost of credit and more availability of funds.

But in recent years, various Small and Medium Business choose a multiple bank relationships. Some questions arise: Why firms borrow from more than one bank? What are the factors influencing the choice of the number of banks by firms?

By borrowing from more than one bank, the firm can solve the hold-up banking problem (Sharpe, 1990). Indeed, in the case of a single bank relationship, a bank which lends to a firm learns more about the borrower's characteristics than other banks do. As a consequence of this asymmetric information, the bank acquires an informational monopoly over the firm. The credit cost arises if the bank uses its superior information. In this circumstance, multiple banking can reduce the risk of informational capture. Furthermore, multiple banking can also appear as a protection

against bank liquidity risk (Detragiache et al., 2000). However, firm should not borrow from many banks, because this increase the risk of credit rationed (Thakor, 1996).

This paper focuses on the factors influencing the choice of the number of banks by firms. We proceed as follows. In section 2, we present the different results of the theoretical and empirical literature. Then, we use these theories to formulate assumptions relative to firm's characteristics and Bank relationships characteristics. In section 3, we describe the data we use. The accounting data provided by a French database called DIANE<sup>1</sup>. We also sent a questionnaire by electronic mail to several Small and Medium Business stemming from the same French database, to collect a qualitative data concerning bank-firm relationships during 2009. The data from this survey are unique and are not available in any databases used in similar studies. Next, we present an econometric analysis. Section 4 presents econometric results. Finally, in section 5 we summarize and conclude.

## 2. Literature Review

According to the financial intermediation theory, we distinguished between two types of bank financing: single bank relationship and multiple bank lending. Single banking has generally been considered as beneficial for Small and Medium Business because it facilitates efficient usages of loans; it's based on cost minimization. This kind of firms, are known to be very opaque, may find it difficult to credibly signal their quality in order to access the capital markets. A bank can solve this problem of information asymmetry by creating information. In that sense, a bank acquires through time private information about the firm, leading to an informational advantage (Fama, 1985). Much of this information is obtained in the subsequent monitoring role that is often seen as a defining characteristic of bank financing (Diamond, 1984). It thus appears that a single bank relationship reduce information asymmetry and credit rationing. These elements enable to formulate the first hypotheses to test: the most informational opaque firms should be characterized by a reduced number of banks. However, this private information about firms, allows banks to accrue monopoly power. Information asymmetries about the firm's quality credit prevent other banks from identifying the real type of each borrower (Sharpe, 1990). Indeed, firm with single bank relationship may be informationally captured by its bank. This hold-up problem allows bank to extract rents from the firm and makes credit costly, but it can present an advantage in terms of credit availability for firms. To limit a single bank's ability to extract rents, one of solution is the diversification of financing sources (Rajan, 1992). In fact, competition among banks reduces the adverse effects of the hold-up problem. Then hypothesis n°2 is that: number of banks increases with the duration of banking relationship.

Moreover, multiple bank lending relationships protect firm from an illiquidity risk of banking origin (Detragiache et al., 2000). The SMB and those have a single banking relationship are strongly exposed to adverse selection. So, if the informed bank cannot renew the initial loan, the firm in liquidity need has to apply for loans from non-informed banks. These banks probably may refuse to extend credit because of adverse selection. Thus, firm has to liquidate prematurely a profitable project. To save the risk of illiquidity, firm borrow from more than one bank. Firm rationed by its main bank is characterized by a high number of banks to fill the needed financing, that's our hypothesis n°3.

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Furthermore, firm's quality has an impact on the number of banks. According, to a model developed by Yosha (1995), high quality firms will choose a single banking relationship to prevent information leaks to competitors. Whereas, low quality firms will prefer multiple banking lending to prevent from aggressive price reactions of competing firms. It follows that, the number of banks depend on the degree of revelation of firm's confidential information; several banks permitted information leakage to competitors. Battacharya and Chiesa (1995) share the same opinion, the single banking lending prevent information leakage. So, firms developing Researches & Developments activities prefer venture capital financing or single banking relationship. We formulate the following hypothesis n°4: the most profitable firm reduces its number of banks to prevent any information leak.

Concerning the empirical literature review, the different studies present conflicting results. Early empirical studies were mainly concerned with consequences of number of banks on the cost and availability of credit. Using US data, Petersen and Rajan (1994) and Cole (1998) find that borrower from fewer banks increase the availability of credit for smaller firms. Harhoff and Korting (1998) examine the impact of relationship strength in Germany. They find that firms obtain more credit from mainly one bank. More recently, Brunner and Krahen (2005) find an average number of 5,7 bank relationships per German firm. Similarly, Foglia and al. (1998) analyzing a sample of 1900 Italian Small and Medium Business, find that single bank relationship increases the availability of credit, and they do not found any significant effect of the number of banks on the interest rates. But recently, Bonfim and al. (2009) find that firms can reduce the cost of credit by increasing the number of banks. Using listed Norwegian firms, Degryse and Ongena (2001) find that less profitable, younger, more leveraged and larger firms choose the multiple banking relationships. Farinha and Santos (2004) analyzing about 1577 young Portuguese firms, find that firms with poor performance and firms with large growth options switch with from single banking to multiple lending relations. Indeed, a young firm establishes a relationship with one bank and earns a good reputation to initiate multiple relationships later.

Ongena and Smith (2000) present an overview of international studies on single versus multiple banking relationships. Using a sample of 1079 large firms from 20 European countries, they find that more than 20% use eight or more banks, while less than 15% choose single bank relationship. Firms maintain more bank relationships in countries with inefficient judicial systems and poor enforcement of creditor rights.

Finally, the number of banks can also be related to bank liquidity risk. This assumption is empirically validated by Detragiache and al. (2000) and Tirry (2007). Indeed, Detragiache and al. (2000) show that in their sample of 1849 small and medium sized Italian firms, the number of banks increase with firm size, leverage, and age of the firm. Firms with a lower profitability choose single banking relationship. Bank fragility has a positive impact on the number of bank. Similarly, using a sample of Italian SMB, Tirry (2007) finds that firms which are more likely to become rationed increase the number of banks.

The extant knowledge on the relationship between bank and firms is rich but suffers from a lack of established empirical results. In fact, little evidence is provided in France due to the lack of specific data: Refait (2003) finds that the number of banks

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increase with the risk of the firm and Ziane (2003) suggests that firm's size, profitability and the degree of information opacity reduce the number of credit relationships.

From the literature review, we formulate hypotheses based on relations between Small and Medium Business and the number of bank lending relationships. We will test them on the recent French data for the year 2009.

To sum up, the different hypotheses are:

- **H1:** Most informational opaque firms should be characterized by a reduced number of banks.
- **H2:** The number of banks increases with the duration of banking relationship.
- **H3:** Firms rationed by his main bank are characterized by a high number of banks to satisfy the needed financing.
- **H4:** Most profitable firm reduces its number of banks to prevent any information leak.

### 3.Data and Methodology

#### 3.1 Data

Our source of data is D.I.A.N.E (Disc for Economic Analysis) edited by Bureau Van Dijk. These data concern bank-firm relationships during 2009 in French. We exclude firms belonging to the sector of financial activities, agricultural for balance sheet complexity. Thus, the manpower of selected firms is lower than 500 employees. We use two types of data: a qualitative data and an accounting data. Indeed, we sent a questionnaire by electronic mail to 5000 Small and Medium Business stemming from the French database, to collect a qualitative data. The number of answers until now is about 200; only 144 answers are exploitable for this study. The data from this survey are unique and are not available in any databases used in similar studies. We have specific data regarding the identity of the main bank of each firm, the proportion financed by the main bank, the total number of banks, a direct measure of credit rationing, etc. We extract the accounting data from the same database to complete these answers.

#### 3.2 Variables

We expect to empirically examine the determinants of the number of banks for French SMB. Thus, the dependant variable is number of banks. Regarding the independent variables, they are three types; Variables measuring firm's characteristic, bank relationships characteristics and a set of X variables that may influence the choice of the number of banks. We obtain the following linear regression:

Number of Banks = f (firm's characteristics, bank relationships characteristics, X)

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We use ordinary least squares (OLS) with  $\varepsilon_i$  the random error term of the regression:

$$NB_i = \alpha + \beta_1 \text{ Firm's characteristics}_i + \beta_2 \text{ Bank relationships characteristics}_i + \beta_3 X_i + \varepsilon_i$$

- Dependent variable:  
*NB*. Number of banks in relation with the firm during 2009.
- Independent variables:

### **Firm's Characteristics**

Firm's characteristics describe opacity and quality of the firm, which refer to the first, and the fourth hypotheses of the study. We define quality as the firm's ability to meet its debts. It's an inverse measure of its risk of default.

**SIZE:**We use the logarithm of total assets. Based on the assumption of opacity of the firm, we expect a positive relationship between firm size and the number of banks. A large firm usually has large financing needs that cannot be satisfied by a single bank.

**AGE:**We use the logarithm of the number of years since the establishment of the firm. An old firm is less opaque than a young firm. We expect a positive relationship between firm age and the number of banks.

**ENDET:**It is corresponded to the value of total financial debt reported to the value of equity.

**LIQ:**We define the liquidity as the ratio of liquid assets to debt coming due in the near time. A significant liquidity is associated with a lower risk of default.

**PERF:**Performance measures the ratio between profit before tax and turnover excluding VAT.

**SCORE:**We employ Score AFDCC 2009 which measures the risk of failure of the firm.

### ***Bank Relationships Characteristics***

**RAT:**Credit rationing is measured by a binary variable taking the value 1 if the firm is rationed by their main bank and 0 otherwise. The answers given by firms to the questionnaire gives us a direct measure of rationing.

**DURAT:** Measures the duration of the relationship with the main bank and takes the value 1 if it is more than 10 years and 0 otherwise.

**BQP:**Measures the percentage represented by the main bank financing and takes the value 1 if it is more than 75% and 0 otherwise.

**IRBP:**It is corresponded to the interest rate charged by the main bank.

***X variables***

We consider a set of variables (X) which can influence the choice of the number of banks.

**GRP:**It is a dummy variable measured from responses to the questionnaire, which indicates if the firm is a subsidiary of a group or not.

**MSH:**The importance of firm’s main shareholder is measured by a dummy variable and takes 1 if it is more than 75% and 0 otherwise.

**MSHMG:**To measure the informational asymmetry between shareholders and managers, we use a dummy variable indicating if the main shareholder is also the manager or not.

**RD:**It is a dummy variable, which indicates if the firm invests in research and development or not

Table 1 presents the descriptive statistics for variables used in our regression.

**Table 1: Descriptive statistics**

<b>Variables</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>NB</b>	144	2.576389	1.475107	1	9
<b>IRBP</b>	124	3.910613	.9154545	1.5	6.1
<b>AGE</b>	144	2.988613	.7261578	1.098612	4.736198
<b>SIZE</b>	144	15.06087	1.862872	10.77107	20.11294
<b>LIQ</b>	140	2.772929	3.620208	.12	23.54
<b>ENDET</b>	144	146.5194	737.1656	-328.99	8563.25
<b>SCORE</b>	140	9.75	4.187383	0	17.5
<b>PERF</b>	144	.0397375	.03289237	-1.7265	2.2901

## 4. Results

Econometric results are presented in the following Table

**Table 2: Determinants of the Number of Banks**

	Régression (1)	Régression (2)	Régression (3)	Régression (4)
<b>PBP</b>	-1.054***	-1.257***	-1.266***	-1.345***
<b>DUR</b>	0.233	0.267	0.252	-
<b>IRBP</b>	0.0367	0.0925	0.0666	-
<b>RAT</b>	0.0644	0.691**	0.706**	0.576**
<b>MSH</b>	0.320	0.395	0.500*	0.494*
<b>MSHMG</b>	0.201	-0.167	-0.282	-
<b>GRP</b>	-0.0344	0.404	-	-
<b>Age</b>	-0.229	0.0867	0.0983	-
<b>SIZE</b>	0.468***	-	-	-
<b>LIQ</b>	-0.00976	0.0295	0.0245	-
<b>ENDET</b>	0.00128	0.00199	0.00188	-
<b>Score</b>	0.0130	0.0795**	0.0806**	0.0705**
<b>RD</b>	0.0388	-0.0353	-0.0381	-
<b>PERF</b>	-0.914**	-1.198***	-1.112***	-0.873***
<b>Constant</b>	-4.326***	0.683	0.914	1.666***
<b>N</b>	112	112	112	133
	0.387	0.204	0.191	0.150
*, **, ***:Significance at the 10%, 5% and 1%, respectively.				

Regression (1) exposes results concerning all variables. As expected, the variable representing Firm's size (SIZE) is significant and has a positive impact on the number of banks which validates the first hypothesis (H1). However, coefficients of the variable measuring firm's age (AGE) do not present a level of significance. Its effect is probably captured by the variable Size. In fact, we notice a higher correlation between the two variables. The elimination of the variable SIZE (Regression 2) changed the sign of the variable AGE, which presents a positive but no significant effect on the number of banks. Concerning the importance of the main bank's financing (PBQ), result validates the first hypothesis (H1). The most informational opaque firms should be characterized by a reduced number of banks. These results are also developed by Machauer and Weber 2000, Refait 2003, Ziane 2003 and Hiba 2007. Relating to the second hypothesis (H2), the duration of the main bank's

relationship (DUR) has a positive and no a significant effect on the number of banks. Concerning the impact of firm's quality on the number of banks, results show that the variable PERF influences negatively, and to a significant degree the number of banks, which do not validate the forth hypothesis (H4).

Results of regression (2), which takes into account all the variables except the SIZE, alter some of the results of the regression (1). We find that the variable (RAT) establishes a positive and a significant effect on the number of banks, which is consistent with the idea that firm rationed by its main bank is characterized by a high number of banks to fill the needed financing.

Relating to the characteristics of property and management of the firm measured by the variables X, the results range from the direction of the first hypothesis (H1). In fact, the variable MSHMG, which indicated if the manager is the main shareholder influences negatively but not to a significant degree the number of banks. It appears that in the one hand, firms whose manager is the main shareholder are smaller than others. In the other hand, the separation between property and management reduce the risk of firm's opacity. We also find that the variable GRP, indicating if the firm belongs to a group, has a positive but no significant impact on the number of banks. The degree of opacity of the firm is lower when the firm is a subsidiary of a group. However, the insignificance of the variables GRP and MSHMG limits the scoop of the argument.

Another interesting finding is the positive and significant coefficient related to the variable Score showing that firms with low risk of failure are characterized by a high number of banks. This result confirms the fourth hypothesis (H4). However, the liquidity of the firm (LIQ) has no significant effect but the sign of its coefficient is consistent with the previous result. With regard to the two variables (PERF) and (ENDET), the results do not validate the third hypothesis (H3) relative to the link between firm's quality and the number of banks.

Regression (3) displays the results after the elimination of the two variables SIZE and GRP<sup>iii</sup>. On the whole, the findings are similar to those of regression (2) except that of the MSH variable that becomes significant. In fact, it appears that firms whose share of capital held by the main shareholder is more than 75% maintain relationships with a higher number of banks. A concentrated ownership is more tempted by the choice of multiple banking and the shareholder has a significant bargaining power to negotiate with several banks. This result is consistent with Detragiache et al. (2000). Regression (4) tests the robustness of the results obtained by eliminating variables with insignificant links. This regression confirms the previous results.

## 5. Conclusion

In this paper, we have tried to determine the factors influencing the choice of the number of banks by Small and Medium Business: single bank relationship vs multiple banking. In fact, SMB are known to be very opaque, so banks can solve this problem of asymmetric information by developing credit relationships. Theories of financial intermediation show that single bank relationship is most efficient according to delegated monitoring model. Firms should have a lower cost of credit and more availability of funds. But in recent years, various Small and Medium Business choose



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a multiple bank relationship. In that sense, we formulate hypotheses relative to the number of banks, firm's characteristics and Bank relationships characteristics.

In order to study the determinants of the number of banks, we use a sample of 144 French data. We note that little evidence is provided in France due to the lack of specific data. Indeed, in our study we use two types of data: an accounting data and a qualitative data collected by a questionnaire. Tests validate hypotheses 1 and 3. Our results show that firm's opacity positively influences the number of banks, whereas the link between the quality of the firm and its number of banks remains ambiguous. Moreover, it appears firms exposed to credit rationing are characterized by a more important number of banks.

Finally, it appears interesting to study the impact of the multiple banking on financial conditions for SMB. In other words, we can test the impact of the number of banks on price and non price terms of the loan contract: credit cost, availability of credit and guarantees.

## Endnotes

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<sup>i</sup>DIANE: Disque pour l'ANalyse Economique, edited by the Bureau van Dijk (92, rue de Richelieu, 75002 Paris).

<sup>ii</sup>The only French study done and using survey data was made by Ziane in 2003.

<sup>iii</sup> The two variables GRP and SIZE are highly correlated with several variables.

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