

# Impact of Ownership Structure on Debt Equity Ratio: A Static and a Dynamic Analytical Framework

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## Abstract

This study examines the determinants of capital structure as part of the agency theory. French corporate structure with its high corporate concentration provides able us to analyze how ownership structure affects debt policy. Emphasis is placed on the role of insiders and outsiders ownership in explaining the debt ratio. The empirical study examined a sample of French companies listed on SBF 250 index and observed over the period 1997-2007. Test results show a non linear relationship between managerial ownership and capital structure. Outside shareholdings do not play a disciplinary role to effectively control the behavior of managers in a static framework. However, for high levels of managerial ownership, outside shareholdings does not significantly affect debt ratio. In addition, in a dynamic framework, we document a negative and a significant effect of external investors on debt equity ratio. Furthermore, the effect of management ownership is not significant.

**Keywords:** ownership structure, management ownership, outside shareholdings, capital structure, retrenchment effect, control effect

## 1. Introduction

With reference to the literature, a diversity of research have dealt with the determinants of debt borrowing along the way various perspectives, as mentioned in the arguments, postulating and adopting various methodological frameworks.

Before detailing the methodology and results, a summary of the theoretical framework based on the work of Jensen (1986) and Stulz (1990) is an order. Managers in large firms, generally, receive high salaries and take private benefits. Jensen (1986) points to the preference of managers to increase firm size through excessive investment for private benefit, highlighting the disciplinary role of debt which limits the opportunistic behaviour of managers. Based on the argument of Jensen (1986), Stulz (1990) assumes that managers want to invest funds even if the return of liquidity in the form of dividends is better for shareholders. Debt can alleviate the problem of over-investment because the repayment of debt reduces free cash flow. The cost of leverage in their model is that the repayment of debt may reduce funds available for profitable investments and implements the problem of under-investment (assuming free cash flow).

Even if the debt policy is a mechanism of internal control that reduces the problem of over-investment, why do managers in firms characterized by agency problems repaying Free Cash Flow with an increase in debt ratio? The choice of the leverage itself raises an agency problem between shareholders and managers. As suggested by Zwiebel (1996), the assumption of free cash flow requires disciplinary systems that lead managers to use more leverage. On the contrary, if the disciplinary mechanisms directly control the problem of over-investment, leverage and disciplinary systems are likely to serve as alternative mechanisms to attenuate agency conflicts of Free Cash Flows.

In the theories of corporate governance, there are several control mechanisms to reduce agency conflicts between shareholders and managers such as the remuneration policy for managers, characteristics of the Board of Directors, labor market managers and market control of the firm, ownership structure, and concentration of ownership (Agrawal & Knoeber, 1996, Jaccely & Maximilano, 2010; Dimitris & Psillaki, 2010; Julie & Yang, 2010).

Moreover, within financial theory (Demsetz, 1983; Shleifer & Vishny, 1986; Agrawal & Mandelker, 1990;

Dimitris M. & Psillaki M, 2010; Julie A.E & Jimmy Y, 2010; Alvaro G. & Taboada, 2011), the decision of funding depends on firm's ownership structure. Given these arguments, it appears that the debt is associated with the ownership structure and thus it justifies the purpose of this article. Our paper is organized as follows. In the second section we examine previous empirical and theoretical literature which has developed the potential links between ownership variables and capital structure. Section 3 will be devoted to the analysis of data and methodology. The results are presented in section 4 using two methods of estimation "GMM" method and "Data Panel" method. Dynamic analysis of the relationship between of ownership structure and debt equity ratio is reported in section 5. Sensitivity tests are conducted in section 6. Section 7 will present the concluding remarks.

## 2. The Literature Review

The question of the relationship between debt and ownership structure (Shleifer & Vishny, 1986, Boot & Thakor, 1993, Dewatripont & Tirole, 1994, Burkart, Denis & Panunzi, 1997; Myers, 2000) raised a controversy between the main currents of financial literature. Moreover, debt plays a role to reduce risk and agency costs of the firm as suggested by Fama (1980). In line with the work of Alchian and Demsetz (1972) and Jensen and Meckling (1976), Fama (1980) defines the firm as a group of factors of production. Indeed, managers and shareholders behave in their own interests. In addition, managers are interesting to ensure survival and sustainability of the firm in order to protect their human capital. In this regard, Fama (1980) argues that the separation between ownership and voting rights can be explained as an effective system of economic organization within the firm. Thus, to ensure the survival of the firm, Fama (1980) emphasizes that managers try to minimize the risk of bankruptcy by reducing the firm's debt ratio. This result highlights a negative relationship between debt and managerial ownership.

In the light of the theoretical work of Jensen and Meckling (1976) who assume that the issue of external debt leads to agency costs arising from conflicts of interest between existing shareholders and creditors and the managerial ownership reduces the agency costs, Kim and Sorensen (1986) examine empirically the relationship between debt and agency costs. Thus, following the methodology suggested by Leland and Pyle (1977), Downes and Heinkel (1982) and Rozeff (1982), Boquist and Moore (1984), Bowen, Daley and Huber (1982), Ferri and Jones (1979), Flath and Knoeber (1980), Jensen (1983) and Scott and Martin (1975), Kim and Sorensen (1986) divide a sample of 168 U.S. firms into two groups: one group containing 84 firms with high managerial ownership, and a second group containing 84 firms with low managerial ownership. Managerial ownership in the first group equals to 43%, whereas in the second group it equals to 2%. The empirical results show that managerial ownership positively and significantly affects capital structure of the firm. This can be explained by the existence of agency costs. However, these nonparametric tests have some drawbacks, including not taking into account the effects of other factors on capital structure ratios. Kim and Sorensen (1986) resolve this problem by testing a system of equations and conclude that these models explain only 20% of the variation of debt and that managerial ownership positively and significantly affects the debt equity ratio.

Stulz (1988) examines the impact of managerial ownership on market value of equity and financial decisions. The author develops a model in which conflicts of interest between managers and outside shareholdings occur only when a potential takeover affects differently the utility of the various partners of the firm. The author concludes that the premium paid is an increasing function of managerial ownership. On the other hand, Stulz (1988) reports that the debt increases managerial ownership, reducing therefore the probability of takeover, and increasing the premium paid. Harris and Raviv (1988) develop a theoretical model similar to Stulz (1988) and conclude a positive relationship between debt and managerial ownership.

In line with the work of Peterson and Benesh (1983), Dhrymes and Kurz (1967), McCabe (1979), Jalilvand and Harris (1984), Jensen and Solberg (1992) examine the factors explaining share of capital held by management, and debt and dividends decisions. Using a sample of 565 firms for 1982 and 632 firms for 1987 in an "American" context and using the method of triples least squares, Jensen and Solberg (1992) conclude a significant relation between managerial ownership and financial decisions.

Working in the line with the approaches of Huddart (1993) and Admati, Pfleiderer and Zechner (1994) which examine the role of the controlling shareholder in solving problems of managerial moral hazard, and the work of Harris and Raviv (1991) which explores the capital structure in the presence of agency conflicts and / or asymmetry information, Zhang (1998) examines the effect of debt equity ratios on investment decisions of a firm controlled by a large risk-averse shareholder. The author concludes that the controlling shareholder is more likely to accept the project if the firm has higher capital structure ratio. In short, the work of Zhang (1998) implies a positive relationship between debt equity ratio and ownership concentration. The larger the share capital held by the controlling shareholder, the more the firm employs debt (Mehran, 1992; Friend and Lang, 1988).

Based on the theoretical and empirical works of Demsetz and Lehn (1985), Crutchley and Hansen (1989), Galai and Masulis (1976), Amihud and Lev (1981) and May (1995) that highlight the causal relationship between managerial ownership and risk of the firm, the work of Jensen, Solberg and Zorn (1992) that examines the interdependence of managerial ownership, debt and dividends, the work of Ravid (1988), Friend and Lang (1988) that emphasize the relationship between debt and managerial ownership, Chen and Steiner (1999) analyzes the effect of share of capital held by managers on debt equity ratio and dividend distribution. Using a Least Square method, Chen and Steiner (1999) conclude a significant relation between insider ownership and debt decision and between insider ownership and dividend decision.

John and Minkler (2001) incorporate the theoretical arguments put forward by Jensen and Meckling (1976) and develop a dynamic model that examines the relationship between debt and ownership concentration. John and Minkler (2001) conclude that the debt and ownership concentration are inversely related.

Rishard and Fosberg (2004) propose to test the theory of Friend and Hasbrouck (1988) using a sample of 350 U.S. firms for a period of seven years from 1990 to 1996. Having replicated descriptive statistics, Rishard and Fosberg (2004) conclude that the capital structure ratio is a decreasing function of the share of capital held by management. In addition, the authors conclude that institutional ownership positively affects debt equity ratio and attenuate the retrenchment behaviour of managers.

Following the work of Demsetz and Lehn (1985) and Himmelberg, Charles P., Hubbard, R. Glenn, Palia and Darius (1999), Demsetz and Villalonga (2001) who argue that the ownership structure and performance are often affected by the same financial characteristics of the firm, Michael and Santor (2008) study the effect of the family ownership on the performance and debt equity ratio for a sample of 613 “Canadian” firms for a period of 8 years from 1998 to 2005. Following the empirical methodology developed by Himmelberg, Charles P., Hubbard, R. Glenn, Palia and Darius (1999), Claessens, Stijn, Djankov, Simeon, Fan, J.P.H., Lang, Larry H.P (2002), Michael and Santor (2008) points to the positive and statistically significant effect of control of individual shareholders on firm’s debt ratio consistent with the theoretical proposals of Stulz (1988). Similarly, ownership family and institutional ownership affect positively and significantly the debt equity ratio.

Based on the methodology developed by Leibenstein (1966), Dimitris and Psillaki (2010) test the interdependence of leverage, management ownership and firm performance. Using an estimate of the firm’s productivity efficiency, Dimitris and Psillaki (2010) examines the impact of debt on agency costs. Specifically, the authors test the impact of debt on firm performance (Jensen & Meckling, 1976). In addition, the econometric task is to test the effect of efficiency on the firm’s capital structure and whether this effect varies with industries. Similarly, Dimitris and Psillaki (2010) explicitly consider the role of ownership structure in capital structure and performance of the firm. Using the method of least squares, the empirical results show that debt significantly affects firm efficiency (McConnell & Servaes, 1995; Jensen, 1986; Stulz, 1990, Booth & Maksimovic, 2001). Similarly, the concentration of ownership significantly affects the performance of the firm within the chemical industry. Concerning the second model, the empirical results show a positive and significant effect of the firm efficiency on capital structure ratio. The authors conclude, also, that the ownership concentration does not affect significantly the firm’s debt ratio for all industries sectors except for the sectors of information technology and research and development.

By referring to the work of Bradley et al. (1984), Titman and Wessels (1988), Kale et al (1992), Rajan and Zingales (1995), Booth et Jarell et Kim (2001), Flannery and Rangan (2006) and Hovakimian (2006) made in the context of Latin America, Jacelly and Maximiliano (2010) evaluates the capital structure determinants using a sample of 806 non-financial firms for a 10-year period from 1996 to 2005, belonging to seven countries, “Argentina”, “Brasile”, “Chile”, “Colombia”, “Mexico”, “Peru” and “Venezuela.”. Having replicated descriptive statistics, the authors show a statistically significant negative relationship between debt and ownership concentration. In addition, the coefficient on the variable “Herf-ind2” is positive and statistically significant. These results highlight the existence of a nonlinear relationship between capital structure and ownership concentration.

### **3. Data and Methodology**

#### *3.1 Sample Selection*

In our research, we use a sample of 246 non-financial French firms listed on the index “SBF250” for a period of 11 years from 1997 to 2007. The sample can be described as follow; oil sector: 17 firms (6.90%), industrial sector: 115 firms (46.74%), transportation sector: 20 firms (8.13%), trade sector: 42 firms (17.07%), service sector: 52 firms (21.14%). The study of the effect of ownership variables on capital structure requires the use of different sources of information. The databases “MERGENTONLINE”, “DATASTREAM”, and “FMI” are our

primary sources of financial information. Occasionally, we use the database “MERGENTONLINE” to collect accounting and financial data from company financial statements. The market capitalization of firms is obtained by consulting the database “DATASTREAM”. With regard to the macroeconomic factors used to calculate the market value of debt (interest rate long-term interest rates in the short term, price index for consumption), they are obtained from the database “FMI”. Regarding the data on the ownership structure of firms, they are obtained from the annual reports available on the “MERGENTONLINE” database.

### 3.2 The Models

We tested our models using two dependant’s variables; debt equity 1 and debt equity 2. Regarding the first step, and as our subsequent theoretical developments may indicate: it is to test the relationship of non-linearity between management ownership and capital structure in a static framework;

$$DE1 = f(MSO, MSO^2, SIZE, PER, IND, TRA, COM, SER, VOLTY, GROWTH, PROF, FCF, INTA, NDT, DIV) \quad (1)$$

Then, we test the relationship between outside shareholdings and capital structure.

$$DE1 = f(EBO, SIZE, PER, IND, TRA, COM, SER, VOLTY, GROWTH, PROF, FCF, INTA, NDT, DIV) \quad (2)$$

The third test is the study of the relationship between outside shareholdings and capital structure at different levels of management ownership referring to the financial theories of the firm, namely the agency theory and portfolio theory.

$$DE1 = f(MSO, MSO^2, EBO, \phi EBO_5, SIZE, PER, IND, TRA, COM, SER, VOLTY, GROWTH, PROF, FCF, INTA, NDT, DIV) \quad (3)$$

Finally, we operationalise our approach to a dynamic analysis of the relationship between debt and ownership structure using a partial adjustment model that underlies the “trade off” theory revisited following the methodology advocated by Flannery and Rangan (2006). This theory assumes the existence of a target debt ratio (Shyam-Sunder & Myers, 1999; Hovakimian, Opler, & Titman, 2001; Ivo Welch, 2004). Thus, in a dynamic framework we estimate the following models

$$DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} + (1-\lambda)BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \varepsilon_{it} \quad (4)$$

$$DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} + (1-\lambda)BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \beta_6MSO_{it} + \beta_7(MSO)_{it}^2 + \beta_8EBO_{it} + \beta_9(\phi EBO_{it}) + \varepsilon_{it} \quad (5)$$

$$\Delta DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} - \lambda BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \beta_6FCF_{i,t+1} + \varepsilon_{it} \quad (6)$$

$$\Delta DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} - \lambda BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \beta_6FCF_{i,t+1} + \beta_7MSO_{it} + \beta_8(MSO)_{it}^2 + \beta_9EBO_{it} + \beta_{10}(\phi EBO_{it}) + \varepsilon_{it} \quad (7)$$

$$DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} - (1-\lambda)BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \beta_6MB - EFWA_{i,t} + \varepsilon_{it+1} \quad (8)$$

$$DE1_{i,t+1} = (\lambda\beta_0)X_{i,t} - (1-\lambda)BL_{i,t} + \beta_1PER + \beta_2IND_{it} + \beta_3TRA + \beta_4COMM + \beta_5SER + \beta_6MB - EFWA_{i,t} + \beta_7MSO_{i,t} + \beta_8(MSO)_{it}^2 + \beta_9(\phi EBO_{it}) + \varepsilon_{it+1} \quad (9)$$

### 3.3 Choice of Variables and Hypothesis to Be Tested

#### 3.3.1 The Dependant Variables

Following Rajan and Zingales (1995), we use two main measures of long-term debt ratio are used; the first is debt equity 1 (DE1) (Friend & Lang, 1988 ; Titman & Wessels, 1988; Harvey, Lins & Roper, 2004; Kee Hong, Kang & Wang, 2011) which measures the level of debt as the ratio of the book value of long term debt to market value of equity; the second measure is debt equity 2 (DE2) (Bowman, 1980; Brian & Zhang, 2011; Prasit U, Seksak J, Pornsit J, 2011) by substituting the book value of long term debt by market value of long term debt (the Market Value of Long Term Debt is approximated using the formula of Miguel and Pindado (2001).

#### 3.3.2 The Explanatory Variables

**Management ownership** is approximated by the percentage of shares held by all executive directors and

non-administrative. Managerial ownership is a great incentive to manage the business in accordance with the interests of shareholders (Jensen & Meckling, 1976, Grossman & Hart, 1982 ; Claessens, Djankov, Fan & Lang, 2002; Anderson & Al, 2003; Kouki M & Ben Said H, 2011). We assume that for low levels, the managerial ownership is positively related with the debt ratio (***hypothesis of alignment of interest 1***). In addition, Jensen and Meckling (1976) Grossman and Hart, (1980), Chen and Steiner (1999), Hermalin and Weisbach (1991) argue that for levels of managerial ownership above 20%, debt and managerial ownership are inversely related. Due to the effect of retrenchment, we assume that for high levels of managerial ownership is negatively related with debt ratio (***retrenchment effect hypothesis 2***). For sensitivity analysis, we use as approximation of management ownership, the share of capital held by the largest shareholder, two largest shareholders, three largest shareholders, four largest shareholders and five largest shareholders.

**External Block Ownership** is approximated by the percentage of shares held by the five largest shareholders. Friend and Lang (1988), Mehran (1992) and Shleifer and Vishny (1986) suggest that External Block Ownership is encouraged to control managers (Friend and Lang, 1988; Mehran, 1992). Due to the effect of control (Shleifer and Vishny, 1986), we assume that the External Block Ownership is positively related with the debt ratio (***effect control hypothesis 3***). However, previous studies have considered only the effect of outside shareholdings on capital structure (Friend et Lang, 1988; Jensen and Solberg, 1992; Kim and Sorensen, 1986; Mehran, 1992). In our paper, we will test the effect of the interaction of institutional Ownership with managerial ownership on capital structure. For low levels of managerial ownership (Dummy variable less than 20%), external shareholders try to attenuate retrenchment behaviour of managers (effect of control), resulting a higher debt ratio (***hypothesis 4***). However, for high levels of managerial ownership (Dummy variable above 20%), we document two alternative effects; effect of control of institutional shareholders rewarded by a retrenchment effect of managers. Thus, the relationship between outside shareholdings and debt for high levels of managerial ownership is weakened (***hypothesis 5***). Similarly, for sensitivity analysis, we use the share of capital held by the largest shareholder, two largest shareholders, three largest shareholders and four largest shareholders.

**SIZE**, similar to Jacelly, Maximiliano and Carlos (2010), we approximate size of the firm by the natural logarithm of total assets. This variable is inversely related to risk of bankruptcy. Then “size” positively affects capital structure ratio of the firm (Scott and Martin, 1975, Ferri and Jones, 1979, Friend and Lang, 1988, Agrawal and Nagarajan, 1990). In addition, the “Free Cash Flow” theory of Jensen (1986) suggests that large firms, with significant cash flow, are expected to issue more debt to discipline managers and ensure tax savings. In addition, information asymmetry is likely less significant for larger firms than smaller firm. Thus, larger firms can fund their projects from the financial markets leading to lower capital structure ratio. We suppose a positive relation between size and leverage (***hypothesis 6***).

**Activity sectors**, Boquist and Moore (1994), Flat and Knoeber (1980), Kai L, Heng and Zhao (2009) call for integrating the impact of industries on the debt ratios. Using the Standard Industrial Classification “SIC” digit Codes. In particular, we will also integrate the following sectors: Oil (PER), Industrial (IND), Transport (TRA), Trade (COM) and Service (SER).we compute this variable as a binary variable (1 or 0).

**Volatility** differently to Booth and al (2001), Bradley and al., 1984; Chaplinsky and Niehaus (1993), Wald (1999), we approximate the volatility by the standard deviation of the annual percentage change in operating income before interest, taxes and depreciation. Indeed, Hsia (1981) and Titman and Wessels (1988) highlight that volatility is an indicator of bankruptcy probability of the firm. Thus, we argue a negative relationship between volatility and capital structure (***hypothesis 7***).

**Growth opportunities** differently to Rajan and Zingales (1995) and Booth and al. (2001), we approximate growth opportunities by the annual percentage change in total assets. Kim and Sorensen (1986), Titman and Wessels (1988), Jensen et al (1992) and Mehran (1992) suggest that growth opportunities for the firm attenuate agency costs of debt and resolve the problem of sub investment of managers. Thus, we document a negative correlation between growth opportunities and capital structure. Furthermore, Pecking Order theory of Myers and Majluf (1984) predict an inverse relationship between growth opportunities and leverage. We suppose a negative relationship between growth opportunities and leverage (***hypothesis 8***).

**Free Cash Flow** we approximate Free Cash Flow similarly to Lehn and Poulsen (1989) and Jensen (1986). In the presence of “Free Cash Flow”, Huang and Song (2006) argue that debt act as discipline mechanism to control the behaviour of managers. In this case, we highlight a positive relationship between “Free Cash Flow” and capital structure. However Brailsford and al (2002) predict a negative sign. Thus, we consider that the sign of this variable is ambiguous.

**Profitability**, to assess the firm’s profitability we use operating income before interest and taxes divided by total

assets. According to trade off theory, profitability positively affects leverage of the firm (DeAngelo and Masulis, 1980). Furthermore, the theory of Pecking Order argue a negative relation between profitability and leverage (Myers and Majluf, 1984) (Hypothesis 9) (Rajan & Zingales, 1995; Wald, 1999; Booth et al., 2001; Wiwattanakantang, 1999).

**Intangibility** previous studies have used several measures of tangibility assets (Jensen & Meckling, 1976): inventory plus gross plant and equipment to total assets (Titman & Wessels, 1988); and the ratio of tangible assets to total assets (Rajan & Zingales, 1995; Short, Keasey & Duxbury, 2002). In our paper, we will approximate intangibility by the ratio of total intangible assets divided by total assets. According to Long and Maltiz (1985), Friend and Lang (1988), Marsh (1982), Rajan and Zingales (1995), and Wald (1999), we argue a positive relationship between tangibility and leverage. Thus, it will be inferred that intangibility is negatively related to leverage (*hypothesis 10*).

**NDTS**, DeAngelo and Masulis (1980) suggest that the tax saving can affect debt ratio of the firm. This variable is approximated by the annual depreciation expense divided by total assets. The authors highlight that tax savings is negatively related to capital structure. Then, consistent with the Pecking Order theory the negative sign of tax savings is a proxy of firm's profitability (Myers, 1977; Myers & Majluf, 1984). On the other hand, the theory trade off predicts a positive sign (*hypothesis 11*) (De Angelo & Masulis 1980; Graham, 1996).

**Dividends**, is measured as the dividends paid each year reported over the total dividends paid during the period (Howard and Brown, 1992). According to Brailsford and al (2002), the effect of dividends on debt equity ratio depends on the tax rate. The sign of the dividends variable is ambiguous.

Table 1. Measures of variables and predicted signs

Variables	Symbole	Measures	Predicted Sign
Book Debt Equity Ratio	DE1	BVLTD / MVE	Dépendant variable
Market Debt Equity Ratio	DE2	MVLTD / MVE	Dépendant variable
Managerial Ownership	MSO	Capital share held by managers and board members	+ / -
External Block Ownership	EBO5	Capital share held by five largest shareholders	+
Firm's size	SIZE	Log (TA)	+
Managerial Ownership	IO i	Share of capital held by the largest manager shareholder, two largest, three largest, four largest and five largest managers shareholders	
External Block Ownership	EBO i	Share of capital held by the largest outsider shareholder, two largest, three largest and four largest outsiders shareholders	
Volatility	Volty	Standard deviation of variation of EBIT	-
Growth Opportunity	Growth	Annual percentage change in TA	-
Free Cash Flows	FCF	(EBIT+DAP-TAX-DIV)/TA	+ / -
Profitability	PROF	EBIT / TA	-
Inatangibility	INTANG	IA / TA	-
Non debt tax shield	NDTS	DAP / TA	+
Dividends	DIV	(annual dividends / total dividends)	+ / -

Notes: **BVLTD**: Book Vaue of Long term Debt; **MVLTD**: Market Value of Long term Debt; **MVE**: Market Value of Equity; **TA**: total assets; **EBIT**: Earnings before interest and taxes; **DAP**: depreciation and amortization; **TAX**: tax paid; **DIV**: dividends paid; **IA**: intangible assets.

## 4. The Empirical Results

### 4.1 Correlations and Descriptive Statistics

Table 2 presents the descriptive statistics. Average debt ratios "DE1" and "DE2" are about 0.394 and 0.378 respectively. These values are below the average debt ratio found by Brailsford, Olivier and Pua (2002), which is 0.5352. The average level of managerial ownership "MSO" for French firms is 35.5%. This average value is somewhat higher than average values found by Morck, Shleifer and Vishny (1988) and McConnell and Servaes (1990), which are respectively 10.6% and 11.84%. Regarding the outside shareholdings "EBO5", we recorded an average value of 56.3 % with a minimum and a maximum of 5.03 % and 99.9 %, respectively. This average value is near the average value found by Brailsford, Olivier and Pua (2002), which is 43.28%. We can conclude, therefore, that French firms are characterized by relatively high average managerial ownership compared to the average value found by previous empirical studies and that outside shareholdings have a higher share of capital. French firms are characterized by relatively low growth opportunities as the average value of the variable

“GROWTH” amounts to 13.8%. The average profitability of French firms is low and is only 7.33 % with a minimum of 85% and a maximum of 94%. This result means that the probability of loss and gain are high. This conclusion is consistent with the average value of the volatility of the rate of change in earnings before interest and taxes, which is equal to 135.5%. The descriptive statistics also allows us to conclude that intangible assets constitute a small share of the total assets which is equal to 8.7%. Since the specificity of assets negatively affects firms’ debt, the low average value of the variable “INTA” explains the relatively high values of debt ratios “DE1” and “DE2”. Similarly, this result is confirmed by the low average tax savings “NDTS” which is equal to 4.1%. On the other hand the low average value of the variable “INTA” means low spending in research and development, which explains the low growth opportunities for French firms.

Table 2. Descriptive statistics of all variables (246 non financial French firms; 1997 – 2007)

	Mean	Médian	Maximum	Minimum	Standard Dev
DE1	0,394	0,166	4,838	0,00000145	0,591
DE2	0,378	0,156	4,8446	0,00000136	0,577
MSO	0,355	0,337	0,998	0,000100	0,279
EBO5	0,563	0,552	0,999	0,0503	0,178
SIZE	18,131	19,399	25,949	1	5,958
VOLTY	1,355	0,480	15,656	0,0385	2,496
GROWTH	0,138	0,0354	15,245	-2,691	0,634
FCF	0,620	0,0634	0,485	-0,825	0,913
PROF	0,0733	0,0703	0,944	-0,849	0,0999
INTA	0,0868	0,0322	0,879	0,000000852	0,119
NDTS	0,0415	0,0328	0,499	0,000163	0,0446
DIV	0,0909	0,0851	0,989	0,0000679	0,0921

Table 3 below shows correlations between different variables of our model. Overall, the level of correlations between variables is low. The variable “SIZE” and “MSO” are negatively correlated (-0.465). In other words, this results suggests that with the increasing size of the firm, it is not easier for managers to buy a large share of capital. We document, also, a positive correlation between the variables “FCF” and “PROF” (0.57). Indeed, we can explain this result by the fact that profitability increases market value of the firm and the amounts of “Free Cash Flows” held by managers. A positive correlation was found between the variables “NDTS” and “FCF”, which is (0.434).

Table 3. Correlation matrix of explanatory variables (246 non financial French firms; 1997 – 2007)

	MSO	EBO5	SIZE	VOLTY	GROW	PROF	FCF	INTA	NDTS	DIV	PER	IND	TRA	COM	SER
MSO	1	0.058	-0.465	0.131	0.033	0.114	0.109	-0.062	0.132	-0.015	-0.080	0.053	-0.200	-0.040	0.15
EBO5		1	0.010	0.040	-0.022	-0.013	-0.005	0.028	0.0007	0.031	-0.060	-0.010	-0.010	0.022	0.04
SIZE			1	-0.135	0.050	-0.212	-0.076	0.092	-0.222	0.085	0.104	-0.117	0.288	0.029	-0.13
VOLTY				1	0.012	-0.183	-0.118	-0.095	0.044	-0.002	-0.061	0.108	-0.021	-0.051	-0.03
GROWTH					1	0.010	0.007	0.059	-0.087	-0.015	0.024	-0.037	-0.029	-0.001	0.04
PROF						1	0.570	0.029	0.027	0.016	-0.026	0.114	-0.049	-0.044	-0.05
FCF							1	0.040	0.434	-0.047	0.055	-0.009	-0.056	0.055	-0.03
INTA								1	0.053	0.036	-0.012	-0.129	0.064	0.240	-0.07
NDTS									1	-0.083	0.083	-0.053	0.002	0.047	-0.02
DIV										1	0.002	-0.002	-0.0005	-0.004	0.005
PER											1	-0.286	-0.081	-0.109	-0.15
IND												1	-0.286	-0.384	-0.53
TRA													1	-0.109	-0.15
COM														1	-0.20
SER															1

## 4.2 Results of the Econometric Tests

### 4.2.1 Effect of Management Ownership on Debt Equity Ratio

Table 4 reports the effect of ownership structure on debt equity ratio for two estimation methods; “GMM” and “data panel” method. Overall, the explanatory variables explain between 5.09% and 12.59% of long term debt depending on whether the dependant variable is a market or a book measure and the estimation method.

**Management ownership** a positive and significant effect of managerial ownership is observed for all specifications. This result is consistent with the hypothesis of alignment of interests of Jensen and Meckling (1976). However, the coefficient on the variables “MSO<sup>2</sup>” is negative and statistically significant at levels of 10% and 5%. This result confirms the entrenchment hypothesis. Indeed, with high levels of management ownership, power of the managers become greater and try to use lower debt ratio.

**SIZE** consistent with the findings of Ferris and Jones (1979), Agyenim B. (2004) and Tong L., Tirtiroglu (2008) this variable has a positive and statistically significant sign at the 1% level which is consistent with hypothesis 6. This result means that larger firms in French Market have higher debt ratios because it is usually easier for large firms to borrow from banks or to issue debt in the capital market. Indeed, larger firms can issue debt at a cheaper cost than can small firms (Titman & Wessels, 1988).

**Activity sectors**, we report that firms in the industrial sector have higher debt ratios (for all specification) (Scott & Martin, 1975; Bradley, Jarell & Kim, 1984). This result is consistent with the findings of Agyenim (2004) who concludes that textile, building and construction, mining and exploration have more debt in their capital structure compared to automobile, agriculture, food and transport. However, corporations in the petroleum, transportation and service are less leveraged, since their coefficients are negative and statistically significant.

**Volatility** in contrast with the result of Queen and Roll (1987) and Nguyen T., Ramachandran (2006), the coefficient on volatility is not statistically significant for all specifications, meaning that the risk of exploitation of French firms does not affect their debt ratios. However, the negative sign of volatility, for specifications “e” and “P”, mean an inverse relationship between volatility and leverage due to the higher probability of bankruptcy of firms.

**Growth Opportunity** contrary to previous studies and consistent to Jacelly, Maximiliano and Carlos (2010), we find a positive and significant relationship between leverage and growth for all specifications, except specifications “c” and “d”. This result is inconsistent with the arguments of Bradley et al (1984), Mehran (1992), Titman and Wessels (1988), who obtain a negative and significant relationship between growth opportunities and leverage of the firm. On the other hand, this result is coherent with Pecking Order theory suggesting that more growth opportunities of a firm, the greater the firm borrows to finance opportunities.

**Profitability** is negative and statistically significant at the level of 1% for the two measures of debt equity ratios. This result means that profitable firms use their internal resources to finance investment which implies lower debt ratios. This conclusion is consistent with the hypothesis of the pecking order of Myers (1977) and Myers and Majluf (1984), and also the empirical results of Titman and Wessels (1988), Friend and Lang (1988), Chiarella, Pham, Sim and Tan (1992), Allen (1993). The negative sign is consistent with hypothesis 9.

**Free Cash Flows** in contrast with results of Brailsford, Olivier and Pua (2002), we find a positive and significant effect of this variable on capital structure at the level of 1%, only for “data panels method”. This result means that even if firms have large amounts of “Free Cash Flow” that allow them to finance themselves, they issue debt to finance their growth opportunities (and so managers follow a value maximizing behaviour due to the disciplinary role of debt).

**Intangibility** In contrast to Udell (1994) and Allen and Qian (2005), the empirical tests show that this variable is positive and significant, except specifications “a” and “b”. This result means that asset specificity does not create problems of debt financing.

**The Non-Debt tax shields (NDTS)** the coefficient on this variable is positive and significant at level of 1% consistent with the prediction of Pecking Order theory (De Angelo and Masulis 1980; Graham, 1996) and our hypothesis. This suggests that firms with higher depreciation expenses have higher debt ratios and does not support the neutrality of taxation on capital structure.

**Dividends** in contrast with the findings of Lee and Xiao (2004) who conclude a negative influence of dividend payments on the listed firm’s debt ratios, we obtain a positive and non significant effect of dividends on capital structure for “GMM” method, and a positive effect for “data panels” method. The positive sign for this variable does not support the results of Kouki and Ben Said (2011) who reported that the disciplinary role of debt does

not support companies with high dividends. But, when we consider adjustment debt policy to target debt ratio, dividends affects positively and significantly capital structure at the level of 1%. This means that firms issue debt to finance distribution of dividends.

Table 4. Relation between management ownership and debt equity ratio

	GMM Method				Data Panel method			
	DE1		DE2		DE1		DE2	
	a	b	c	d	e	f	g	h
Constante	-2,873***	-2,794**	-2,807**	-2,735**	-0,668**	-0,601**	-0,686***	-0,628**
MSO	1,133**	1,0125**	1,258***	1,1429**	0,466**	0,447**	0,578***	0,559**
MSO <sup>2</sup>	-1,0729*	-0,959*	-1,189**	-1,0785**	-0,627**	-0,606**	-0,727***	-0,707***
SIZE	0,148***	0,152***	0,143***	0,147***	0,0488***	0,0516***	0,0475***	0,0501***
PER		-0,263**		-0,246**		-0,198*		-0,186*
IND	0,141**		0,128**		0,119**		0,108*	
TRA		-0,372**		-0,350***		-0,204*		-0,193*
COMM		-0,0285		-0,00629		-0,0241		-0,00116
SER		-0,0993		-0,0951		-0,1245*		-0,118*
VOLTY	0,00737	0,00792	0,00884	0,00933	-0,00145	-0,00124	0,000619	0,000802
GROWTH	0,035*	0,346*	0,0308	0,0303	0,0561***	0,0559***	0,0505***	0,0503***
PROF	-1,335***	-1,298***	-1,242***	-1,207***	-1,825***	-1,803***	-1,718***	-1,696***
FCF	0,265	0,227	0,191	0,153	0,573***	0,549**	0,502**	0,478**
INTA	0,185	0,171	0,225*	0,208*	0,270**	0,252**	0,304***	0,283**
NDTS	2,451***	2,526***	2,633***	2,702***	1,631***	1,668***	1,849***	1,882***
DIV	-0,0999	-0,107	-0,103	-0,109	0,0723	0,0678	0,0632	0,0590
R <sup>2</sup>	5.54%	5.86%	5.09%	5.56%	12.18%	13.06%	11.39%	12.56%
CHIX DEUX	140,920	143,20	135,050	137,990	159,930	162,700	153,560	156,920

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

#### 4.2.2 The Effect of Outside Shareholders on Debt Equity Ratio

The empirical results of the impact of the outside shareholders in the debt equity ratio are presented in table 5.

**Outside shareholdings:** Contrary to the result of King and Santor (2008), who report a positive and statistically significant relationship between debt and institutional shareholders, in our empirical analysis, the coefficient on the variable “EBO 5” is not statistically significant. This result means that the majority shareholders, despite their significant investment, do not play a disciplinary role to effectively control the behavior of managers. This lack of disciplinary role intensifies managerial opportunism, which leads to higher agency conflicts. This finding allows us to reject the effect control hypothesis. The explanatory variables are generally unchanged signs, except for the variable “DIV” that becomes negative but remains insignificant. We also record other differences compared to the results of the first model. However, for the two estimation methods, the variable “SER” remains negative and statistically significant at 10%. The variables “GROWTH” and “FCF” variables “INTA” become positive and statistically significant at the 1% level for all specifications.

#### 4.2.3 The Effect of Outside Shareholders on Debt Equity Ratio for Different Levels of Management Ownership

The empirical results of testing the effect of institutional ownership for different levels of management ownership are presented in table 6. The results support the proposition that the relationship between institutional ownership and leverage for high levels of management ownership differs from that at low levels of management ownership.

The results also support the quadratic relationship between the variable “MSO” and leverage. The coefficients on the variables “MSO” and “MSO<sup>2</sup>” are significantly positive and negative respectively. The coefficient on the variable “EBO 5”, tests the relationship between the external shareholders and debt equity ratio for low levels of management ownership, is negative and significant at the 1% level. This result means that controlling shareholders does not play a disciplinary role to monitor effectively the behaviour of managers. This result rejects the hypothesis 4. However, for high levels of managerial ownership, outside shareholdings does not significantly affect debt ratio. In other words, the relationship between outside shareholdings and leverage is weakened, which is consistent with the hypothesis 5. This result means that for high levels of management ownership external shareholders have no role in controlling the behavior of managers.

### 5. Dynamic Analysis of the Relationship between Ownership Structure and Debt Equity Ratio

The empirical results are presented in Table 7 and show that the variables of the “Trade Off” theory explain at least 56.60% of the debt ratio of firms in the French context. The coefficient on the lagged variable “DE1 (t-1)” (“DE2 (t-1)”) implies that the speed of adjustment is between 24.1% (= 1-.759) and 25% (= 1-.750) (between 25.2% (= 1-.748) and 27.3% (= 1-0727)) of the difference between the current debt ratio and target debt ratio in a year. At this rate, we expect that firms take approximately two years to cover 50% of the gap between current debt ratio and target debt ratio. However, adding the ownership structure variables, “MSO” and “EBO5” does not improve the previous results. In addition, relatively to our static approach developed previously, we observe a negative and statistically significant at the 10% level of institutional ownership on debt equity ratio (specification, “TO4”). However, unlike the static case, the non-linearity relationship between debt and managerial ownership is not verified.

Similar to Frank and Goyal (2003) and Flannery and Ragan (2006), we test the relationship between debt and ownership structure in the context of the “Pecking Order” theory. The results presented in Table 5 shows that the tested models explain between 26.06% and 28.72% of the variation in the debt ratio. Contrary to the results of Flannery and Ragan (2006), the coefficient associated on the variable “MB-EFWA” is different from 1 and not significant for all specifications. In doing so, we can conclude that the “Pecking Order” theory is a generalized formulation of the “Trade Off” theory (Frank and Goyal, 2003), rather than a unique explicative factor of the capital structure. The results concerning the effects of management ownership and other shareholders remain unchanged from the previous case.

The results of the “Market Timing” theory highlighted by Baker and Wurgler (2002) show that the coefficient on the variable “MB-EFWA” is negative and statistically significant for both measures of debt equity ratio. This result means that the “Market Timing” theory does not explain the behavior of French corporate finance. The speed of adjustment varies between 23.6% (= 1-.764) and 27.10% (= 1-0729). Non linear relationship between management ownership and debt equity ratio is not verified. However, we document a negative and statistically significant effect of institutional ownership for the specification “MT2”, and a positive and statistically significant effect for the specification “MT4”.

Table 5. Relationship between outside shareholders and debt equity ratio

	GMM Method				Data panel Method			
	DE1		DE2		DE1		DE2	
<b>Constante</b>	-0,540***	-0,471*	-0,514**	-0,460*	-0,520**	-0,447*	-0,500**	-0,443*
<b>EBO5</b>	-0,0305	-0,0243	-0,0169	-0,00829	-0,0662	-0,0627	-0,0478	-0,0428
<b>SIZE</b>	0,0460***	0,0489***	0,0427***	0,0458***	0,0466***	0,0496***	0,0434***	0,0466***
<b>PER</b>		-0,237**		-0,228**		-0,240**		-0,231**
<b>IND</b>	0,132***		0,123**		0,134***		0,125**	
<b>TRA</b>		-0,173*		-0,175*		-0,176*		-0,179*
<b>COMM</b>		-0,0717		-0,0533		-0,0753		-0,0566
<b>SER</b>		-0,129*		-0,123*		-0,129*		-0,123*
<b>VOLTY</b>	-0,0097	-0,0103	-0,00765	-0,00828	-0,009952	-0,0105	-0,00778	-0,00844
<b>GROWTH</b>	0,0537***	0,0535***	0,0488***	0,0486***	0,0535***	0,0533***	0,0486***	0,0484***
<b>PROF</b>	-1,858***	-1,842***	-1,759***	-1,741***	-1,853***	-1,836***	-1,753***	-1,735***
<b>FCF</b>	0,614***	0,597***	0,550***	0,532***	0,612***	0,596***	0,548***	0,530***
<b>INTA</b>	0,283***	0,270**	0,319***	0,304***	0,284***	0,272**	0,320***	0,306***
<b>NDTS</b>	1,354***	1,399***	1,552***	1,599***	1,358***	1,403***	1,558***	1,606***
<b>DIV</b>	0,0518	0,0472	0,0479	0,0428	0,0515	0,0469	0,0474	0,0421
<b>R<sup>2</sup></b>	9.41%	9.64%	8.74%	9.09%	7.34%	11.32%	10.05%	10.66%
<b>CHIX DEUX</b>	166,900	168,950	157,750	160,310	167,180	169,170	157,840	160,310

Table 6. Effect of institutional ownership on debt equity ratio for different levels of management ownership

	GMM Method				Data Panel Method			
	DE1		DE2		DE1		DE2	
C	-3,0929*	-3,0849*	-3,120*	-3,103*	-0,375	-0,306	-0,434	-0,375
MSO	0,661*	0,593*	0,842**	0,775**	0,381	0,368	0,571**	0,557*
MSO <sup>2</sup>	-0,626*	-0,559*	-0,788**	-0,721**	-0,526*	-0,509*	-0,694**	-0,677**
EBO5	-0,340**	-0,347**	-0,300**	-0,308**	-0,321**	-0,325**	-0,276**	-0,280**
$\phi EBO5$	0,0498	0,0408	0,0252	0,0166	0,0163	0,0142	-0,00742	-0,009516
SIZE	0,1812**	0,189**	0,178**	0,186**	0,0496***	0,0526***	0,0482***	0,0510***
PER		-0,308**		-0,293**		-0,204*		-0,192*
IND	0,1604***		0,147**		0,1200**		0,108*	
TRA		-0,492***		-0,478**		-0,206*		-0,197*
COMM		-0,0368		-0,0140		-0,0224		0,000194
SER		-0,0823		-0,0760		-0,123*		-0,116*
VOLTY	0,0116	0,0125	0,0136	0,0143	-0,00110	-0,000897	0,000973	0,00117
GROWTH	0,0231	0,0218	0,0196	0,0186	0,0547***	0,0544***	0,0492***	0,0490***
PROF	-1,266*	-1,182*	-1,121	-1,0434	-1,825***	-1,801***	-1,714***	-1,690***
FCF	-0,0701	-0,159	-0,174	-0,266	0,574***	0,549**	0,499**	0,474**
INTA	0,179	0,147	0,1916	0,156	0,269**	0,251**	0,305***	0,284**
NDTS	2,308*	2,495*	2,566**	2,742**	1,618***	1,657***	1,844***	1,880***
DIV	-0,649*	-0,677**	-0,645*	-0,671**	0,0781	0,0736	0,0695	0,0653
R <sup>2</sup>	4.68%	4.88%	4.09%	4.43%	12.23%	13.15%	11.36%	12.56%
CHIX DEUX	90,950	93,100	82,560	85,690	165,380	168,310	157,910	161,440

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

Table 7. Relation between ownership structure and debt equity ratio in the context of trade off, pecking order and market timing theories

	Trade Off Theory				Pecking Order Theory				Market Timing Theory			
	DE1		DE2		DE1		DE2		DE1		DE2	
	TO1	TO2	TO3	TO4	POT1	POT2	POT3	POT4	MT1	MT2	MT3	MT4
C	0.102	0.0150	-0.0692	0.0454	-0.0956	0.0222	-0.0611	0.0541	-0.0292	0.109	0.00938	0.126
MSO		0.0396		0.014		0.0415		0.0178		-0.00169		0.00739
MSO <sup>2</sup>		-0.0244		-0.00467		-0.0274		-0.00922		0.0267		0.0115
EBO5		-0.193*		-0.186*		-0.194*		-0.187*		-0.212*		0.205*
$\phi EBO5$		0.0118		0.0242		0.0116		0.0238		0.0158		0.0275
SIZE	0.00949***	0.0139***	0.00732**	0.0116***	0.00920***	0.0136***	0.00696**	0.0112***	0.00897*	0.0116**	0.00719	0.0102*
PER	-0.0611**	-0.0531*	-0.0598**	-0.0506*	-0.0619**	-0.0539*	-0.0606**	-0.0515*	-0.0680**	-0.0624*	-0.0658*	-0.0581*
IND	0.0346**	0.0315*	0.0397***	0.0359**	0.0349**	0.0318*	0.0400***	0.0361**	0.0325*	0.0338*	0.0367**	0.0362**
TRA	-0.0436	-0.0530*	-0.0450	-0.0499*	-0.0432	-0.0523*	-0.0444	-0.0491*	-0.0427	-0.0505	-0.0447	-0.0456
COMM	-0.0181	-0.00579	-0.0315	-0.0202	-0.0190	-0.00671	-0.0322	-0.0210	-0.00999	-0.00566	-0.0186	-0.0122
SER	-0.0355*	-0.0342*	-0.0377*	-0.0367*	-0.0356*	-0.0342*	-0.0377*	-0.0367*	-0.0341*	-0.0370*	-0.0379*	-0.0409*
VOLTY	0.000549	0.00256	-0.00025	0.000772	0.000549	0.00262	-0.00026	0.000839	-0.00051	-0.00006	-0.00192	-0.00206
GROWTH	0.138***	0.125***	0.131***	0.121***	0.138***	0.125***	0.131***	0.120***	0.156***	0.143***	0.146***	0.134***
PROF	-0.475***	-0.462***	-0.473***	-0.461***	-0.529***	-0.502***	-0.534***	-0.510***	-0.635***	-0.620***	-0.653***	-0.638***
INTA	0.0565	0.0287	0.112*	0.102	0.0582	0.0304	0.113*	0.103*	0.0277	0.0215	0.0890	0.0915
NDTS	0.170	0.285	0.205	0.354*	0.101	0.230	0.127	0.289	0.152	0.196	0.160	0.235
MB-EFWA									-0.00027	-0.00022	-0.00042	-0.00037
FCF					0.0955	0.0728	0.108	0.0882				
BL (t-1)	0.759***	0.750***			-0.240***	-0.250***			0.764***	0.759***		
ML (t-1)			0.748***	0.727***			-0.251***	-0.272***			0.747***	0.729***
R <sup>2</sup>	60.15%	58.25%	59.39%	56.60%	26.06%	26.27%	27.35%	28.72%	61.36%	59.80%	59.65%	57.14%
CHIX	3493.980	2960.090	3387.820	2767.490	460.750	412.370	479.860	461.090	3161.250	2780.030	1943.310	2489.330
DEUX												

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

## 6. Robustness

### 6.1 Effect of Activity Sectors on the Relationship between Ownership Structure and Leverage

According to Xu and Wang (1997) activity sector has a significant effect on capital structure. In addition, by referring to the work of of Tong L., Tirtiroglu (2008) who observes significant differences in the long term leverage for different activity sectors. The authors conclude a significant coefficient estimate on manufacturing industry. Doocheol M., and Kishore T (2007) have tested the effects of activity sectors on debt equity ratios using a sample of firms belonging to different industry groups. Other empirical tests on factors influencing capital structure have included industry classification (Bos & Fetherson, 1993; Scott & Marton, 1976). Schmidt (1976) argues that activity sector is a relevant factor in explaining capital structure. Contrary to above studies, Remmers (1974) and Belkaoui (1975) conclude that an activity sector does not influence debt policy of firms. Thus, in this paragraph we check the robustness of the results reported above by examining the effect of activity sector on the relationship between ownership variables and capital structure. The results are reported in table 8 for alternative specifications and shows that our models explain between 17.72% and 42.06% of the debt equity ratio of our sample.

Table 8. Effect of activity sectors on the relationship between ownership structure and debt equity ratio

	Oil	Industry	Transportation	Trade	Service
C	0.778*	1.023***	0.730	-2.574***	0.243
MSO	0.261	0.763*	1.642**	2.358***	0.014
MSO <sup>2</sup>	0.399	-0.904**	-1.020	-1.855**	-0.304
EBO5	-1.558***	0.144	0.089	1.417**	-1.124***
$\phi EBO5$	0.006	0.001	-0.680***	-0.441**	0.071
SIZE	0.055***	-0.027***	-0.006	0.073***	0.058***
VOLTY	-0.125*	-0.029***	-0.139***	0.080***	0.024*
GROWTH	-0.004	0.099***	-0.135*	0.039	0.037
PROF	-1.326*	-3.699***	-6.811***	-3.440***	-0.945***
FCF	-0.600	0.738**	2.897**	0.409	0.418
INTA	0.214	0.222	0.183	0.954***	-0.637***
NDTS	-0.406	1.004*	4.237***	1.382	0.995*
DIV	-0.052	-0.122*	-0.158	-0.329	0.760***
R <sup>2</sup>	24.02%	17.72%	42.06%	22.79%	20.22%

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

For the trade and industry sector, we recorded a non-linear relationship between management ownership and leverage. Unlike oil and service sectors, external shareholders for the trade sector stimulate French firms to finance their projects through debt. The empirical results also show that the effect of outside shareholders on the debt equity ratio for high levels of management ownership is negative and statistically significant for the transport and trade sectors. This result means that the retrenchment effect of managers reward the positive effect of controlling shareholders. For the control variables, size affects positively and significantly the debt equity ratio to the oil, trade and service sector. Variables "VOLTY" and "GROWTH" are equipped with expected signs and are statistically significant for the industry and transport sectors. The empirical results show also that profitability increases cash flow and reduces therefore the need for external funds. The effect of the variable "FCF" is positive and statistically significant for the industry and transport sectors. This result means that shareholders of firms in these sectors stimulate managers to borrow in order to avoid the overinvestment problem. In accordance with what is expected, we recorded statistically significant effects of intangible assets and tax savings. Finally, unlike the service sector, dividends and debt are two substitutes' mechanisms to control the behavior of managers.

### 6.2 Alternative Measures of Management Ownership

It is interesting to examine the validity of our results using alternative measures of management ownership. Our model is therefore tested using different approximations of management ownership already exposed. The estimation results, using the "GMM" method are presented in Table 9 for five specifications. First, we find a non-monotonic relationship between management ownership and leverage, except for the second specification, when adopted as a measure of management ownership, the share of capital owned by the two largest manager's shareholders. While the effect of the institutional ownership, "EBO" and the dummy variable " $\phi EBO5$ ", remain

unchanged signs, but not significant. For control variables, the results of the variables “SIZE”, “GROWTH”, “PROF”, “INTA” and the activity sectors remain unchanged. The variables “VOLTY” and “FCF” change of signs, but are still not statistically significant. Regarding the variables that identify the effect tax, they kept their signs and significances. So we can conclude that the results have not changed significantly.

### 6.3 Alternative Measures of Participation Outside Shareholders

Similarly, to test the effects of alternative measures of institutional ownership, we re-examine our model by using different approximations already specified. The estimation results are reported in Table 10 for four alternatives. The non-monotonic relationship of management ownership remains checked. In other words, we record an effect of alignment of interests for low levels of management ownership and an entrenchment effect for high levels of management ownership. Institutional ownership is always a substitute mechanism to control the behavior of managers. However, the effect of the institutional ownership for high levels of management ownership is still weak and not significant. For control variables, we have recorded no change in sign or significance.

Table 9. Relationship between ownership structure and debt equity ratio for alternatives measures of management ownership

	Largest shareholder manager		Two shareholders	first largest managers	Three shareholders	first largest managers	Four shareholders	first largest managers	Five shareholders	first largest managers
	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1
C	-2,818**	-2,811*	-2,930**	-2,940**	-2,874**	-2,862**	-2,876**	-2,865**	-2,875**	-2,863**
IO <sub>i</sub>	0,724**	0,701**	0,200	0,195	0,527*	0,510*	0,529*	0,509*	0,541*	0,520*
with i=1-5										
MSO <sub>i</sub>	-0,852***	-0,826**	-0,0705	-0,0698	-0,425*	-0,411*	-0,420*	-0,403*	-0,432*	-0,414*
EBO5	-0,130	-0,122	-0,141	-0,134	-0,1297	-0,120	-0,127	-0,118	-0,126	-0,117
$\phi EBO5$	0,0432	0,0352	0,0709	0,0602	0,0369	0,0290	0,0356	0,0280	0,0341	0,0267
SIZE	0,1606**	0,167**	0,167**	0,175**	0,163**	0,170**	0,162**	0,170**	0,1628**	0,169**
PER		-0,347***		-0,368***		-0,353***		-0,352***		-0,351***
IND	0,146***		0,160***		0,152***		0,151***		0,151***	
TRA		-0,382**		-0,415**		-0,390**		-0,389**		-0,388**
COMM		-0,0384		-0,0518		-0,0413		-0,0412		-0,0405
SER		-0,0853		-0,0938		-0,0924		-0,0927		-0,0926
VOLTY	-0,000355	-0,00208	-0,000591	-0,00223	-0,000508	-0,00224	-0,000315	-0,00204*	-0,000241	-0,00197
GROWTH	0,0236	0,0230	0,0217	0,0208	0,0225	0,0220	0,0225	0,0219	0,0225	0,0220
PROF	-1,438**	-1,393**	-1,407**	-1,350**	-1,441**	-1,395**	-1,442**	-1,396**	-1,443**	-1,397**
FCF	0,147	0,0850	0,113	0,0472	0,121	0,0586	0,123	0,0600	0,123	0,0601
INTA	0,211	0,1822	0,198	0,167	0,209	0,179	0,210	0,179	0,210	0,180
NDTS	1,645	1,822*	1,700*	1,896*	1,644	1,823*	1,637	1,817*	1,637	1,815**
DIV	-0,605**	-0,628*	-0,652**	-0,678**	-0,634**	-0,656**	-0,633**	-0,656**	-0,633**	-0,655**
R <sup>2</sup>	4.86%	4.93%	4.55%	4.57%	4.88%	4.96%	4.90%	4.97%	4.90%	0,04968
CHIX	95,050	96,510	87,800	88,67	90,190	91,730	91,270	91,800	90,380	91,930
DEUX										

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

Table 10. Relationship between ownership structure and debt equity ratio for alternatives measures of outside shareholders

	Largest shareholder	institutional	Two largest shareholders	institutional	Three largest shareholders	institutional	Four largest shareholders	institutional
	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1
C	-3,199**	-3,208**	-3,222**	-3,220**	-3,0702*	-3,0625*	-3,0412*	-3,0338*
MSO	0,672**	0,613**	0,665**	0,593*	0,637*	0,569*	0,652*	0,584*
MSO <sup>2</sup>	-0,652**	-0,595*	-0,624*	-0,554*	-0,597*	-0,530*	-0,611*	-0,544*
EBO <sub>i</sub> avec i =1-4	-0,196**	-0,179*	-0,209**	-0,210**	-0,307**	-0,310***	-0,366***	-0,372***
$\phi EBO_i$	0,0468	0,0321	0,0469	0,0377	0,0516	0,0427	0,0493	0,0401
SIZE	0,176**	0,185**	0,180**	0,188**	0,178**	0,186**	0,179**	0,188**
PER		-0,287**		-0,299**		-0,301**		-0,304**
IND	0,152***		0,157**		0,158***		0,158***	
TRA		-0,469***		-0,489***		-0,485***		-0,489***
COMM		-0,0355		-0,0319		-0,0348		-0,0347
SER		-0,0805		-0,0821		-0,0826		-0,0805
VOLTY	0,0104	0,0113	0,0111	0,0120	0,0113	0,0122	0,0115	0,0124
GROWTH	0,0239	0,0228	0,0232	0,0219	0,0228	0,0215	0,0227	0,0214
PROF	-1,324*	-1,241*	-1,274*	-1,191*	-1,286*	-1,204*	-1,271*	-1,188*
FCF	-0,0337	-0,121	-0,0242	-0,111	-0,0304	-0,117	-0,0579	-0,146
INTA	0,186	0,155	0,180	0,149	0,188	0,157	0,183	0,152
NDTS	2,185*	2,366*	2,230*	2,408*	2,203	2,381*	2,272*	2,455*
DIV	-0,594*	-0,624*	-0,633*	-0,660*	-0,645*	-0,672**	-0,643*	-0,671**
R <sup>2</sup>	4.93%	5.09%	4.67%	4.87%	4.76%	4.97%	4.73%	4.94%
CHIX DEUX	88,440	90,480	91,890	94,170	93,550	95,750	93,430	95,580

Notes: \*, \*\*, \*\*\*: significance levels at the 10 %, 5% and 1% respectively.

## 7. Concluding Remarks

Recent events related to the study of the impact of ownership structure on debt equity ratio show that this debate is central in financial theory (Mahadwartha & Ismiyanti, 2006; Kai.L, Heng.Y, & Longkai.Z, 2009; Alvaro G. Taboada, 2011). Thus, the aim of our paper is to articulate the evolution of the theory of the determinants of capital structure of companies focusing on the role of ownership structure in static and dynamic frameworks. The study of the relationship between debt and ownership structure is motivated by the theoretical work of Jensen (1986) and Stulz (1990). In addition, Jensen and Meckling (1976) explore the relationship between debt and ownership concentration and conclude that the optimal ratio of debt reduces the agency costs of debt and equity. Furthermore, the literature review shows relatively separate fields. The first current is dominated by the work of Kim and Sorenson (1986), May (1995), Nguyen T and Ramachandran. N (2006) and Doocheol M and Kishore T (2007) who find a positive relationship between debt and ownership structure. In contrast, the second stream is in line with the work of Leland and Pyle (1977), Friend and Lang (1988), Jensen, Solber and Zorn (1992), Jacelly and Maximiliano (2010), Joshua Abor (2008) and Wibisono Hardjopranoto (2006) who conclude a negative relationship.

In the second part of our study, we report empirical results that have considerable implications for the capital structure debate and indicate a nonlinear relationship between managerial ownership structure and leverage. Clearly, the results presented in this article lead us to highlights that the distribution of social capital between insiders and outsiders has a statistically significant relationship with leverage. The results suggest that the level of ownership of outside shareholders is negatively related to debt ratio. However, this global vision of the quadratic relationship between debt and managerial ownership can be regarded as insufficient due to the existence of an interaction between managerial ownership and outside shareholdings. Specifically, we find that at low levels of managerial ownership, external shareholders are negatively related to leverage in static and dynamic frameworks. Furthermore, by making a robustness test, we reach a non linear relationship between management ownership and leverage for the trade and industry sectors. We report also a negative and statistically significant effect of outside shareholders on the debt equity ratio for high levels of management ownership is negative and for the transport and trade sectors.

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