Capital Structure and Financing of SMEs: The Tunisian Case

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Abstract

This article contributes to analyze the determinants of the capital structure of 611 tunisian small and medium-sized enterprises (SME's), observed on a duration of six years. We will wonder about the impact of the financial specificities of the SME on their financial structures. For that purpose, we will confront hypotheses of the financial theory with the reality of the SME's. The estimations conducted, via the within model, show that the financial structure is not neutral and that the cost of financing, the profitability and the commercial debt are the main determinants on the banking debts. The estimations also reveal a hierarchy followed by SME's, in their financial choice, favoring the financing by internal funds and by commercial debts. A business sector analysis shows greater financing difficulties for the SME's providing services compared to the industrial SME's.

Keywords: SME, capital structure, financing, panel data

1. Introduction

Small and medium enterprises (SMEs) are the dominant form of business organizations in their contribution to socio-economic development, creating jobs and wealth, both in developing and in developed economies (Gregory et al., 2005; Hussain et al., 2006; Daskalakis & Psillaki, 2008). In Tunisia, SMEs are the main driver of the economy, accounting for almost 90% of the economic fabric and employ more than 50% of the workforce in the private sector (APII, 2010) (Note 1). Despite the importance of SMEs, most of the literature on SMEs suggests that these companies face financing difficulties that limit their growth and development (Gregory et al., 2005; Coluzzi et al., 2009; Ardict et al., 2012). Compared with large enterprises, SMEs are handicapped as for the access to financing from financial institutions and especially for long-term loans. These external funding problems result mainly from the inability of donors of funds to estimate the degree of risk associated with these small entities, which may not provide a basis of reliable information or adequate collateral security. SMEs are characterized firstly by a lack of equity that weakens their solvency (Allegret, 1995). Then, they are associated with a high risk of exploitation mainly due to the lack of diversification of their activities, their limited financial expertise and the lack of separation between the ownership, decision and control functions (Ang, 1992). A large part of the research works deals with the subject of the policy of corporate finance. Although many previous empirical studies have examined the financing of large firms, much less attention is paid to small structures, particularly in transition economies (Hutchinson & Xavier, 2006 for Slovenia; Mateev et al., 2013 for Eastern Europe). On a theoretical level, it is difficult to identify an underlying framework for SMEs to assimilate their financial operation. First, even though several theories have already been developed to explain the corporate debt structure, there is still no consensus theory on which managers can rely to determine an optimal level of debt (Sheikh & Wang, 2011; Colot & Croquet, 2007). Nearly forty years after the pioneers articles of Modigliani and Miller (1958, 1963), we still do not have theories that can explain and guide the choice of corporate financing. Second, SMEs are not perfectly integrated into the Founder financial framework, since the existing theories generally relate to large listed companies. It is possible that some of the mechanisms highlighted in this context are not applicable to the universe of unlisted SMEs. This lack of theoretical framework is a serious handicap to understand and analyze the financial behavior of SMEs. It is in this context that the issue of this study is registered. The objective is to examine the major determinants of the debt ratio by focusing on the impact of financial specificities of SMEs on their capital structure. Our study is organized as follows. Section 2 is devoted to a review of the literature that examines how theories of financing structure can be applied in the context of small businesses. Section 3 presents the potential determinants of the bank debt as well as the empirical hypotheses to be tested. Section 4 describes the

characteristics of the sample and the methodology. We will discuss the results of our empirical study in Section 5. The last section concludes the paper.

2. Review of Theories of Capital Structure

The modern theory of the financial structure of companies goes back to the works of Modigliani and Miller (1958). They point out that under certain conditions, all forms of financing are equivalent and therefore the value of the firm is independent of its financial structure. This principle of neutrality has been widely criticized, particularly in regard to its non-applicability. In order to bring their model to the financial reality, Modigliani and Miller (1963) take into account the tax, including the deductibility of financial interest on the taxable income. They show that the value of the leveraged firm is greater than that of a firm without debt, due to the debt tax shield. However, any increase in the level of debt reduces this value because of the existence of the risk of bankruptcy (Stiglitz, 1969). The existence of bankruptcy costs coupled with the existence of tax advantages, allow to determine an optimal debt level, obtained when the marginal benefits bound to the deductibility of interest charges and the marginal bankruptcy costs associated with increased debt are equal.

In the same way, the lifting of the hypothesis of absence of agency costs can also determine an optimal capital structure (Jensen & Meckling, 1976). Agency costs are generated following the conflicts of interest between managers-shareholders and creditors on the one hand, and between the managers of the company and shareholders on the other hand. SMEs are unlikely to suffer from this second type of conflict, due to the non-separation between the functions of owner and manager. However, conflicts which oppose the creditors to the managers are important and suppose that the latter can divert some of the wealth of their firm at the expense of the creditors. This is possible if the company chooses investment projects whose level of risk is higher than initially expected by the creditors (risk of asset substitution), or when it renounces profitable investment projects (risk of under-investment). SMEs are often characterized by high flexibility of its management which allows it to change quickly the characteristics of its projects. The creditors anticipate this opportunist character of the managers and ask for a rather high financing premium to protect themselves. As a result, Myers (1977) points out that companies with high growth opportunities are not interested in the issue of risky long-term debt risky, that reduce investment opportunities and led to the abandonment of projects economically profitable. Faced with these problems of asset substitution and under-investment, Jensen and Meckling (1976), Myers (1977) and Titman and Wessels (1988) recommend the use of short-term debt in companies with strong growth opportunities. The bankruptcy and the agency costs constitute the essence of the Trade Off Theory, because it is based on a compromise between the costs and benefits of debt (Dufour & Molay, 2010).

By removing the hypothesis of perfect information, many reflections were developed to reduce the information asymmetries, such as signal theory and the pecking order theory. Unlike theories which have been presented, these theories do not provide an optimal debt ratio. The transmission of signals by the company in the form of disclosure information can reduce the information asymmetry and thus make easier the obtaining of debt financing on favorable conditions. The concentration of ownership and involvement of managers is therefore a positive signal about the quality of the company (Leland & Pyle, 1977). Also, a high level of debt is a good signal on the creditworthiness of the company and thus favors the increase of the debts (Ross, 1977). The verification of this theory to the financial reality of SMEs, based on the one hand, on the higher involvement of the managers in the capital and, on the other hand on the over-indebtedness of these companies. Signaling by the debt ratio can not only reduce the risk of undervaluing the company, but also reduce the risk of sub-optimal investment strategy engendered by the opening of the capital. It results a hierarchical order of preference in the ways of financing. The pecking order theory founded by Myers and Majluf (1984) is interested in the choices of financing options determined by their level of information asymmetries and proposes the order: equity–not risky debt–risky debt–opening of the capital. Ang (1991) points out that this theory is easily applied in the context of SMEs which do not seek an optimal financial structure, but whose financing decisions aim at ordering their financing preferences. The manager of the SMEs, having for objective the maximization of their own wealth and anxious to be exposed to the financial discipline imposed by the shareholders and creditors on the one hand, and the dilution of ownership property on the other hand, prefers the internal financing. However, in case of insufficient internal funds, it is preferable to use the debt, rather than raising capital from new investors, so as not to harm existing shareholders. Several studies have examined the empirical validity of the theories of capital structure, and tried to figure out which one is most capable to explain the decisions of corporate finance, but no consensus exists yet, even in the context of developed economies (Sheikh & Wang, 2011). This returns to the fact that the points on which these theories emphasize differ from one theory to another. Despite that there is no universal theory of financing choices (Myers, 2001), the above-mentioned theories can provide a theoretical basis for understanding the financial behavior in particular in the determination of the factors that influence the

financing policy of companies.

3. Determinants of Debt Structure

To identify the determinants of bank debt, we rely on previous studies on this subject which offer a multitude of indicators, supposed to have a significant impact on the bank debt of SMEs. Within the limit of the availability of the data of our study, we select a set of potential determinants of the debt. From these, we formulate hypotheses to be tested on a panel of Tunisian SMEs.

Trade-Off-Theory

The cost of financing.

The deductibility of costs of interest from taxable income increased the appeal to debt rather than equity, from which the remunerations are not deductible. However, the debt increased fixed obligations of the company, so the risk of bankruptcy. The debt level of equilibrium is reached after arbitration between the deductibility of interest costs and marginal bankruptcy costs. The tax benefits of financial debt are reduced in SMEs because of the risk of bankruptcy, which explains their limited debt (Pettit & Singer, 1985; Ang, 1991, 1992; Michaelas et al., 1999. Ziane, 2004). Our first hypothesis is:

H1: Financial interests incite SMEs to reduce their debt (Note3).

The risk.

According to the Trade-Off theory, leveraged firms must periodically pay principal and interest of their debts. However, a high variability of flows increases their bankruptcy risk. Castanias (1983), Bradley et al. (1984), Titman and Wessels (1988), Mackie-Mason (1990), Jensen et al. (1992), Fama and French (2002), Jong et al. (2008) and Sheikh and Wang (2011) suggest that riskier firms tend to reduce their reliance on debt because of the increase of the failure risk with the uncertainty of their cash-flows. Thus, our second hypothesis is as follows:

H2: the volatility of operating income has a negative impact on debt

Agency theory.

Growth opportunities.

The asset substitution problem assumes that high levels of debt may encourage managers to invest in very risky projects, which leads to a transfer of wealth from creditors to managers. Thus, opportunities for significant growth lead to high agency costs that reduce long-term debt. According to Myers (1977), firms with high growth opportunities replace the long-term debt by short-term debt. Therefore, growth opportunities have a negative impact on long-term debt (Titman & Wessels, 1988; Rajan & Zingales, 1995; Johnson, 1997; Scherr & Hulburt, 2001; Hovakimian et al., 2004; Huang & Song, 2006), and positive on short-term debt (Dubois, 1985; Weill, 2002). Regarding SMEs, which favors short-term debts, the impact of growth opportunities on leverage will be positive (Voulgaris et al., 2004; Mateev et al., 2013).

H3: growth opportunities are positively correlated with debt.

Guarantees.

The existence of debt's agency costs arising from the problems of adverse selection and moral hazard incites the creditors to demand guarantees (Myers, 1977; Scott, 1977; Harris & Raviv, 1991). The rigidity of the assets can solve these agency problems by reducing opportunistic behavior of the manager, which increases the possibility of debt (Stiglitz & Weiss, 1981; Titman & Wessels, 1988). The guarantees reduce credit risk by retaining these tangible assets, if the company cannot honor its debt. The concentration of capital increases the risks of managerial opportunism and asset substitution in small businesses (Michaelas et al., 1999; Cassar & Holmes, 2003; Adaskou & Adair, 2011). A positive relationship between the amount of guarantees and the debt seems to exist (Bester, 1985; Long & Malitz, 1985; Bourdieu & Sédillot 1993; Bias et al., 1995; Rajan & Zingales, 1995; Bédué & Levy, 1997; Hovakimian et al., 2004; Huang & Song, 2006; Jong et al., 2008). Our third hypothesis is as follows:

H4: Guarantees have a positive impact on debt of SME's.

Signal theory.

Rentability.

According to Diamond (1984) and Sharpe (1990), good corporate reputation has a positive impact on its relations with creditors. Financial rentability is a good signal on the financial viability of the company and plays an important role in the appreciation of the company by creditors and also in the financial choices by the

managers (Coleman & Carsky, 1999; Bhaduri, 2002; Panno, 2003). This idea is confirmed by the Trade Off theory, which predicts that the most profitable companies are those most indebted for tax benefits. Thus, a profitable firm has stronger probability to pay off its debts (Shyam, Sunder, & Myers, 1999). So, we propose the following hypothesis:

H5: The financial rentability has a positive impact on debt.

The commercial debts.

Diamond (1984) considers that the use of debt by SME's depends on its reputation among its commercial partners. A company is trying to reassure its business partners such as customers or suppliers on its ability to meet its commitments. According to the theory of signal, suppliers' credits may reflect the reputation of companies towards their commercial partners (Leland & Pyle, 1977; Ross, 1977). Thus, banks refer to commercial loans to judge the reliability and creditworthiness of the company. A high amount of commercial debt encourages banks to give credits. Our hypothesis is:

H6: there is a positive relationship between commercial debts and financial debts.

The size.

Several authors support the positive impact of size on debt decisions (Warner, 1977; Ang et al., 1982; Dubois, 1985; Titman & Wessels, 1988; Rajan & Zingales, 1995; Bédué & Levy 1997; Booth et al., 2001; Voulgaris et al., 2004; Aghion et al., 2004; Huang & Song, 2006; Sheikh & Wang, 2011; Mateev et al., 2013). The existence of economies of scale associated with the diversification of the activities of large enterprises, reduces the volatility of their results (Fama & French, 2002). Size is considered as a good signal as far as the more the size of the company is important and the more it is diversified, the more the risk of failure is reduced. This positive sign is also justified by the agency and the Trade-Off-Theory. We so formulate our seventh hypothesis:

H7: The size of the company and debt are positively correlated.

Pecking order theory.

The consideration of the costs associated to the problem of asymmetry information creates a hierarchy between the different sources of funding: internal financing, low-risk debt (bank loans), risky debt (bonds) and capital increase (Myers & Majluf, 1984). Being little sensitive to the asymmetry of information, the debt can be obtained with a lower risk of undervaluation than in case of share issue. Indeed, companies are resorting to debt considered the unique significant source of external liquidity for the majority of SMEs, only when their internal resources are exhausted. To test the hypothesis of the existence of pecking order, several authors establish a negative relationship between profitability and the debts (Titman & Wessels, 1988; Biais et al., 1995; Harris & Raviv, 1991; Jensen et al., 1992; Carpentier & Suret, 2000; Booth et al., 2001; Chen, 2004; Fama & French, 2005; Huang & Song, 2006, Magri, 2009; Sheikh & Wang, 2011). Profitability increases the internal resources of the company and therefore reduces reliance on external debt. This is also confirmed for small firms (Rajan & Zingales, 1995; Cassar & Holmes, 2003; Ziane, 2004; Sogorb-Mira, 2005, Vos et al., 2007; Psillaki & Daskalakis, 2008; Mateev et al., 2013). To verify the existence of a hierarchy of financing, De Haan and Hinloopen (2003) test the following two hypotheses:

H8: Profitability is negatively related to debt.

H9: There is a negative relationship between corporate liquidity and debt.

Viviani (2008), Hirth and Uhrig-Homburg (2010), Sheikh and Wang (2011) and Mateev et al. (2013) argue that liquidity is a key determinant of the level of debt factor, and can reduce debt agency costs. However, the impact of liquidity can also be positive in the context of signal theory, insofar as they have a good signal on the financial situation of the company.

4. Methodology

4.1 The Sample

The sample data used to estimate our model are obtained from the Central Bank of Tunisia (BCT) from the unit Central Balance Sheet. We did not have the opportunity to choose our sample on the basis of the definition most commonly used in Tunisia, according to which the SME is an enterprise employing between 10 and 200 employees, nor to test for the presence of selection bias in our sample compared to the whole sample of the database of the BCT. This database is newly created and is under construction. All the criteria allowing to reveal the accounting identity of firms such as the company name, the address and the phone number are eliminated. The number of employees as well as the interest rate are also masked. The selection of the final sample is made through the

following steps. First time we have chosen all companies for all services. Our sample consists of 1,790 SMEs. According to the BCT, any company making investments not exceeding five million dinars in the activities of manufacturing, crafts and some services is classified as SMEs (Note 2). This database is consisted entirely by non-listed companies, privately owned and not being a part of a group of companies. According to BCT this could be a criterion for defining SMEs. We subsequently eliminated companies with missing or unreliable data which reduces the sample to 1760 firms over a period of 6 years (2004–2009).

Note that the data on each company in our sample sometimes cover the entire period (2004–2009), sometimes a longer or shorter period which makes our initial panel incomplete or not rolled. We chose to keep only firms with data on the period of 6 years. The choice of data over the entire period is justified by the dynamic nature of our model which supposes the inclusion of delays. The choice of a balanced panel results from the necessity of testing the model over several years, by using the largest number of econometric tools. Our final sample includes 611 firms observed over a period of six years from 2004 to 2009.

4.2 Definitions and Measures of Variables

4.2.1 The Dependent Variable

In our analysis, we propose to use an accounting measure of debt. This choice is justified by the nature of our sample composed of unlisted SMEs. To determine the debt level of the company, two accounting measures are also possible in the empirical literature. The first retains the total debt ratio regardless of maturities (Jensen et al., 1992; Rajan & Zingales, 1995). The second distinguishes the short-term debt to long-term debt (Titman & Wessels, 1988). We were obliged to choose the first accounting approach, because of the unavailability of data. The dependent variable in our model is measured by the debt ratio, which is equal to the total debt reported to total assets in accordance with Bias et al. (1995), Suret and Carpentier (2000), Dufour and Molay (2010) and Sheikh and Wang (2011). The choice of total assets is justified by the neutralization of the size effect which will be taken into account as an explanatory variable. We chose to exclude commercial debts because they are important and are substitutable for financial debts in SMEs.

4.2.2 Explanatory Variables

Table 1 shows the definition and the measurement of variables, and also the expected signs. Descriptive statistics for all variables are presented in Appendix 1. Based on the empirical literature, we select the following variables:

The cost of financing: the information extracted from the balance sheets of companies do not allow us to measure the costs associated to debts. Only the financial costs can be determined from the paid interests. Not having access to the interest rates, we measure the cost of financing by the sum of financial expenses reported to the amount of the financial debt (Ziane, 2004).

The risk: Operational risk is often measured with volatility in operating results and / or net income. In our analysis we measure this variable by the change in net income of the company from one year to another (Titman & Wessels, 1988; Booth et al., 2001).

Growth opportunities: are measured by a vast ange of variables. According to Lopez-Gracia and Sogorb Mira (2008), this variable reflects the ability of the enterprise to generate internal funds. Titman and Wessels (1988) use the ratio of R & D on turnover. Jensen et al. (1992) and Chittenden et al. (1996) retain the growth rate of sales. In our study, we measure growth opportunities by the variation of total assets (Bias et al., 1995; Michaelas et al., 1999; Suret & Carpentier, 2000).

Guarantees: Banks generally require collateral when they grant credits to SMEs, particularly in case of long-term debt. This is a necessary condition according to Berger and Udell (1998). Collateral reduce the autonomy of managers who invest only in projects initially planned for fear of losing their assets presented as collateral security. We try to measure the guarantees by the sum of tangible assets reported to total assets (Bourdieu & Colin Sédillot, 1993; Mateev et al., 2013).

Rentability: As an indicator of business performance, financial rentability plays an important role in assessing the company by creditors, and also in the choice of financial policy by managers (Myers, 1977). It seems important to understand the effect of this variable on the debt. Financial rentability is measured by the net income reported to total equity (total equity before appropriation).

Commercial debts: constitute an indicator on the creditworthiness of the company on payment of their debts towards commercial partners. This good signal increases the confidence of banks and favors debt. However, some authors such as Petersen and Rajan (1994) argue that commercial debt is a substitute for financial debt in companies rationed, which decreases the granting of credit by banks. The commercial debts will be measured by

the sum of suppliers debts reported to the total assets.

Profitability: is an indicator of the ability of the company to generate profits from its investments. These gains have a significant impact on the financial choice in companies. In our model, we measure profitability with net income divided by total assets.

Liquidities: highlight the existence of liquidity at the company. They indicate whether the company has internal resources. These liquidities in the hands of managers are not without impact on debt policy. According to Hirth and Uhrig-Homburg (2010), liquid funds represent a decision variable on the level of debt. Liquidity is measured by the amount of liquidity and equivalent liquidity reported on total assets.

The size: the size of the company is one of the most discriminating factors when granting loans by banking institutions (Bradley et al., 1984; Long & Malitz, 1985; Harris & Raviv, 1991; Rajan & Zingales, 1995). Hadlock and Pierce (2010) suggest that the size and age of the company are good indicators of the level of financial constraints. To measure the size, several indicators have been used in the empirical literature, such as the logarithm of turnover, number of employees, the amount of fixed assets, etc. In our study, we use the logarithm of total assets according to Bédué and Levy (1997) and Mateev et al. (2013).

Table 1. Summary of variables and expected relationships

Variable	Definition	Measure	Expected Sign
ENDT	Debt Ratio	financial debts / Total assets	/
INT	Cost of financing	Financial expenses / financial debts	-
CROIS	Growth opportunities	variation of total assets	+
GART	Guarantees	Tangible assets / total assets	+
RSQ	Risk	Variation of net income	-
RENT	Rentability	net income / total equity	+
DCOM	Commercial debts	Supplier debts / total assets	+
PROF	Profitability	Net income/ total assets	-
LIQ	Liquidities	Liquidities and equivalent liquidities / total assets	-
TAIL	Size	Log (total assets)	+

4.3 Method of Analysis

The econometrics of panel data allows to test the defined theoretical hypotheses. The main advantage of panel data is to explain the behavior of individuals over several years, by identifying the dynamic effects between individuals, not detected by cross-sectional data (Baltagi, 1995). The study of data from corporate balance sheets is generally made according to the methods of econometrics of panel data. They allow to highlight the heterogeneity of the observations and control the individual effects, neither by the inclusion of a specific effect assumed certain (fixed effects) or by the inclusion of a specific unobservable effect (random effects). In addition, introducing delayed variables distinguishes between the static and the dynamic model. Indeed, the presence of a lagged endogenous variable among the explanatory variables leads to biased estimations, due to the correlation of the endogenous variable with the error term. These estimators are biased especially when the study period T is limited (Sevestre, 2002). This is our case, since the observation period is 6 years. However, efficient estimators such as Generalized Method of Moments (GMM) are used to take into account the endogeneity of explanatory variables and dynamic aspect of models (Blundell & Bond, 1998). However, the estimation of econometric models by the dynamic approach is tested over long periods. An estimation over a period of T years requires at least T+2 years of observations. Thus, we use techniques of static estimations according to the works done based often on the static model. Our model is composed of 8 explanatory variables, to which we add a constant (α) and an error term (ε). Thus, our model is the following:

$$ENDT_{it} = \alpha + \beta_1 INT_{it} + \beta_2 RSQ_{it} + \beta_3 DCOM_{it} + \beta_4 RENT_{it} + \beta_5 PROF_{it} + \beta_6 TAIL +$$
$$\beta_7 GART_{it} + \beta_8 LIQ_{it} + \beta_9 CROIS_{it} + \varepsilon_{it}$$

With: i the number of SMEs, i = 1....611; t the number of years, $t = 1.....6$; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 are the unknown parameters of the model.

5. Empirical Results and Interpretations

Our empirical study requires the implementation of a set of tests and statistical tools. These statistical tests are made by the software of data processing Stata and Winrats.

5.1 Study of Multicollinearity and Specification Tests

5.1.1 Multicollinearity

The detection of a possible existence of multicollinearity is made through a bivariate analysis, from the study of the correlation matrix (Table 2). The analysis of this matrix reveals that all coefficients of correlation of Pearson are lower than the limit traced by Kervin (1992) that is 0.7. We can confirm the absence of a bivariate multicolinearity between the independent variables included in our model of multiple linear regression.

Table 2. Matrix of correlations

	ENDT	INT	TAIL	GART	LIQ	RENT	PROF	RSQ	CROIS	DCOM
ENDT	1									
INT	-0.487	1								
TAIL	0.135	-0.142	1							
GART	0.293	-0.259	0.113	1						
LIQ	-0.004	0.01	-0.014	-0.032	1					
RENT	-0.032	0.015	-0.007	-0.015	-0.39	1				
PROF	-0.297	0.128	-0.096	-0.121	-0.004	0.045	1			
RSQ	-0.007	0.007	0.15	-0.019	-0.002	0.000	0.005	1		
CROIS	0.026	-0.005	0.037	-0.006	-0.003	-0.001	-0.012	0.644	1	
DCOM	-0.338	0.324	-0.13	-0.366	0.028	0.03	-0.073	0.001	-0.004	1

5.1.2 Specification Test

We begin at first by testing the presence of individual effects, essential for our panel data. The probability associated with the F statistic of Fischer is lower than the maximum tolerated threshold (10%). So we confirm the existence of individual effects, which must be taken into account in our model. Then we use the Hausman test (1978) to discriminate between the fixed effects model and the varying effects model, and verify which one is more suitable for the data used. H-statistic of Hausman is associated with zero probability, which implies that the specific effects are correlated with the explanatory variables and the model is for fixed effects. In this case, we use the estimator Within, supposed the best linear unbiased estimator. Finally, we turn to verify the absence of a problem of error autocorrelation. The results of the OLS estimation show that the Durbin Watson statistic is equal to 1.86. This value is close to 2, so we assume the absence of first order autocorrelation. However, given that we are working on data over several years, the Durbin Watson is not sufficient. The test of Breusch-Godfrey allows the detection of on the one hand a possible second order autocorrelation, and on the other a possible presence of an error heteroscedasticity. Based on the decision rule at the 5% level, we assume the absence of error autocorrelation, since the p-value is higher than 5%. We validate that the errors are uncorrelated at the first and the second order confirming the homoscedasticity of the model.

5.2 Estimation Results of All Sectors

The results of the estimation of econometric determinants of the debt ratio are presented in Table 3. The explanatory power of the model seems to be satisfaying. First, the coefficient of determination R^2 shows that 88% of the variation of the debt level is explained by the selected indicators, which implies a very good quality of adjustment. Then, the F statistic is significant at the 1% level. Thus, we consider that the model is statistically significant and explicative of the phenomenon. The Durbin Watson statistic is equal to 1.86, it is close to 2, which allows us to reject the null hypothesis of the Durbin-Watson test, in particular the autocorrelation of errors.

Overall, it appears that the financial structure of SMEs is not neutral, it is dependent on five significant variables including the cost of financing, guarantees, profitability, growth rate and commercial debts.

The coefficient associated with the variable INT is negative and significant at 1% level. Our first hypothesis (H1) is validated, confirming the theory of trade off. The tax advantages favor the debt of the company through the deductibility of interest expenses. The negative correlation is explained by the fact that debt engenders the increase of default risk in addition to risk associated to the small size of SME's, which reduces the tax benefits and therefore reduces the debt. The variable RSQ influences negatively the level of debt but it is non-significant.

The coefficient associated with the variable CROIS is positive and significant at 10% level. This result confirms the hypothesis (H3) of agency theory. Strong growth opportunities encourage managers to engage in risky projects, which increase the agency conflicts between the owner-manager and the bank. The substitution risk induces the

bank to refuse to grant long-term debt. Thus, SMEs are financed massively by current liabilities. Pecking order theory also justifies this relationship (Dufour & Molay, 2010; Adair & Adaskou, 2011). Indeed, in a context of growth, SMEs are characterized by small size and low cash flows; find their internal resources insufficient to finance their investment projects. They therefore resort to bank loans to keep the control of the company. The results relative to the variable GART show a positive and significant impact of tangible assets on bank financing, which validates the hypothesis (H4). According to the agency theory, the rigidity of assets reduces the opportunistic behavior of the owner-manager and thus facilitates obtaining credits (Lopez-Gracia & Sogorb Mira, 2008). Due to the high costs of failure and agency associated with loans to SMEs, creditors require collateral as an obligatory selection criterion for the granting of loans (Adair & Adaskou, 2011).

Table 3. Results of the model estimation

Dependent variable ENDT Panel Regression : Estimation by Fixed effects				
Variable	Coefficient	Std-Error	T-statistic	Probability
INT	-0.4208	0.0195	-21.577	0.0000000 * * *
TAIL	-7.426 E-0.4	9.926 E-0.4	-0.748	0.454 (ns)
GART	0.0839	0.0139	6.036	0.0000000 * * *
LIQ	-8.853 E-0.4	6.485 E-0.4	-1.365	0.172 (ns)
RENT	8.37E-0.5	4.362E-0.4	0.191	0.847 (ns)
PROF	-0.1402	0.0185	-7.5678	0.0000000 * * *
RSQ	2.8494^E-0.3	2.5667^E-0.3	1.1101	0.267 (ns)
CROIS	0.108	0.0593	1.8205	0.0687 *
DCOM	-0.285	0.0205	-13.9253	0.0000000 * * *
Uncentered R^2	0.949	Centered R^2		0.885
Regerssion F	30.2602	Sum of square residuals		22.146
P value (F-statistic)	0.000000000	Std-Error of Estimate		0.0954

Note. *** significant at 1% level; ** significant at 5% level; * significant at 10% level; (ns): not significant.

The impact of the variable RENT is not significant, the hypothesis (H5) cannot be confirmed. The influence of the DCOM on the level of debt is significant at the 1% level. However, the positive impact of commercial debts contradicts the hypothesis (H6) according to which supplier-credits serve as a good signal of solvency of the SMEs towards its commercial partners. This is explained by the role played by the supplier debts as substitutes for bank loans (Petersan & Rajan, 1994; Adair & Adaskou, 2011). According to Delannay and Dietsch (1999), this variable plays a role of financial shock absorber when the borrowers are companies constrained by the lack of liquidity. This is consistent with the situation of small businesses. The variable TAIL is associated with a positive but insignificant coefficient, thereby which invalidates the hypothesis (H7). This observation can be explained by a fairly homogeneous behavior by Tunisian banks towards all SMEs, regardless of their size. This result confirms the findings of Adair and Adaskou (2011) who underline an ambiguous effect of the size on the debt ratio in SMEs.

The estimation results show a negative and significant correlation at the 1% level between bank debt and profitability of the company, which confirms the hypothesis (H8). This variable plays an important role as a determining factor of internal financing capacity of companies. Our results confirm the ideas of the theory of hierarchical financing under which the amount of external resources needed by the company is inversely related to its ability to generate profits. This preference for internal funds is justified by the high costs associated with an informational imbalance between SMEs and lenders. The impact of the LIQ variable is not significant invalidating the existence of a relationship between the debt ratio and liquidity of the company. Hypothesis (H9) is therefore rejected.

Finally, the results confirm the importance of the apparent cost of financing, growth rates, guarantees provided, commercial loans, and funds generated by SMEs in determining the target debt ratio. To refine our analysis, we highlight the importance of the business sector of SMEs in the determination of its bank debt ratio.

5.3 Estimation Results by Business Sector

Several authors such as Jensen et al. (1992), Holmes et al. (1994), Michaelas et al. (1999), Psillaki et al. (2010) and Adair and Adaskou (2011), support the impact of business sector on corporate financial policy. They underline that each sector is characterized by appropriate ways of functioning and constitute a synthetic indicator of the risk bound to the principal activity of the company. In order to detect differences in the debt behavior in SMEs, we will

realize estimations by business sector, by decomposing our sample into industrial SMEs and SME service providers.

Before making estimations by business sector, we must first verify the presence of an effect sector in our sample. The test to be realized is a test of Fisher of equality of the vectors of parameters. Under the null hypothesis, the model is constrained and the parameter vectors are equal for both business sectors. The F-statistic calculated is equal to 71.5. This value is higher than the tabulated value F (9, 602) which is 1.8. Therefore, we reject the null hypothesis, and we conclude that the vectors of parameter are different. The presence of sector effects confirms the interest to estimate separately the two models for the two business sectors. The second test is also a test of Fischer, which identifies whether the model is homogeneous or heterogeneous. We try to determine if the heterogeneity comes from βi coefficients. Thus, we test the equality of β for all individuals. If we reject the null hypothesis of homogeneity of coefficients βi, then we reject the panel structure. If, however, we accept the null hypothesis we retain the panel structure and then we try to determine in a second stage, if the constants have an individual dimension. We calculate an F-statistic by the test of Hsiao. The probabilities associated with F-statistic are lower than 10% for industrial SMEs and SME's of services. Therefore, the null hypothesis is accepted. So, we verify the existence of identical coefficients for all individuals and specific constants. Thus, the economic relationship highlighted through this model is supposed to differ for all individuals only through constants included in the model. In the presence of this heterogeneous model, we use the Hausman test, which is used to discriminate between the fixed effects and the random effects. The Hausman statistic is associated with a zero probability for the two business sectors, so we favor the adoption of fixed individual effects. The objective is to identify differences in the financial behavior of the two sectors, we realize thus estimations by Within on the group of industrial SMEs, then on the SME of services (Table 4 and 5).

The results show a good quality of adjustment with a coefficient of determination R^2 of 88% and 89% for the industry and service sector respectively. The P-value of the Fisher test is acceptable, since it has a value lower than 5%. Thus, the regression is significant in general for the both groups of SMEs (Note 4).

The results of the estimation of industrial SME are similar to the results of the first estimation relative to the total sample (Table 4). Estimations lead to an important result whether the significant impact of liquidity on the debt policy. This variable is manifested by a positive and significant coefficient at the 5% level. Therefore, if SMEs has financial liquidities, the access to bank loans will be privileged. This invalidates the hypothesis (H9), which assumes a negative effect of this variable on the debt. However, this positive correlation confirms the predictions of the theory of signal, according to which liquidities present a good signal on the financial situation of the company, which helps to obtain bank loans.

Unlike estimations of SME industry sector, the results of estimations of SME's of services lead to three important conclusions. First, the risk variable appears significant, supporting the negative impact of earnings volatility of SME's services on their debt ratio. This result validates the trade-off theory and confirms the hypothesis (H2). Earnings volatility generated by SME of services increases their risk of failure. The uncertainty associated with cash flow generated leads therefore to refusal of financing by banking institutions. A second particular result in the services sector is the emergence of a non-significant coefficient associated with the variable GART. This is due to the nature of the activities belonging to the sector of services, such as commercial, rents or repairs activities which do not require important tangible assets. Compared to industrial SMEs who are equipped with rigid assets, SMEs of services have less important assets, justifying the absence of impact of tangible assets on the use of bank debt. These two results seem to be related. The volatility of profits generated increases the risk of bankruptcy. With this is added the weak real guarantees offered by the companies, what is translated by a refusal of credit by banks. A third result appears to be important is the absence of impact of the variable growth opportunities on access to financial debt. This finding appears in connection with the previous result on the non-significant impact of assets presented as collateral, given that the growth of assets implies an increase of guarantees. From these two results, we conclude that the ideas of agency theory are not confirmed in SME's service providers.

Table 4. Results of the model estimation (industries)

Dependent variable ENDT Panel Regression: Estimation by Fixed effects				
Variable	Coefficient	Std-Error	T-statistic	Probability
INT	-0.367	0.0248	-14.809	0.0000000 * * *
TAIL	-7.129 e-0.5	1.2206 e-0.3	-0.0584	0.9534 (ns)
GART	0.1575	0.0219	7.1963	0.0000000 * **
LIQ	0.0212	8.4894e-0.4	2.4915	0.0128 * *
RENT	3.297e-0.3	2.6983e-0.3	1.222	0.222 (ns)
PROF	-0.413	0.0339	-12.1808	0.0000000 * * *
RSQ	-8.9332^{E}-0.4	2.5262^{E}-0.3	-0.3536	0.7236 (ns)
CROIS	0.0085	0.0043	1.9658	0.0519 *
DCOM	-0.3982	0.0317	- 12.5774	0.0000000 * * *
Uncentered R^2	0.961	Mean of dependent variable		0.2779
Centered R^2	0.886	Std-Error of dependant variable		0.1997
Regerssion F	30.1351	Sum of square residuals		5.613
P value (F-statistic)	0.000000000	Std-Error of Estimate		0.0754

Note. *** significant at 1% level; ** significant at 5% level; * significant at 10% level; (ns): not significant.

Table 5. Résults of the model estimation (services)

Dependent variable ENDT Panel Regression : Estimation by Fixed effects				
Variable	Coefficient	Std-Error	T-statistic	Probability
INT	-0.454	0.0311	-14.5796	0.0000000 * * *
TAIL	-1.8761 e-0.3	1.5616 e-0.3	-1.201	0.2298 (ns)
GART	-3.734e-0.3	0.0177	-0.2106	0.8332 (ns)
LIQ	-1.1357e-0.3	7.5678e-0.4	-1.5007	0.1336 (ns)
RENT	2e-0.5	5.0279e-0.4	0.0397	0.9682 (ns)
PROF	-0.0628	0.0239	-2.63	0.0086 * * *
RSQ	-6.0844^{E}-0.3	2.2697^{E}-0.3	-2.6807	0.0074 * * *
CROIS	-6.2496e-0.3	5.2623e-0.3	-1.1876	0.2352 (ns)
DCOM	-0.2205	0.0286	- 7.7037	0.0000000 * * *
Uncentered R^2	0.946	Mean of dependent variable		0.2923
Centered R^2	0.8924	Std-Error of dependant variable		0.2933
Regerssion F	32.1221	Sum of square residuals		14.2452
P value (F-statistic)	0.000000000	Std-Error of Estimate		0.1079

Note. *** significant at 1% level; ** significant at 5% level; * significant at 10% level; (ns): not significant.

5.4 Analysis of Results

Interest expenses have a significant impact on the debt ratio, regardless of the studied sample. This finding supports the important role played by this variable in the financing policy of SMEs. Trade Off theory is validated in explaining the structure of SME financing regardless of the activity of the company. In small structures such as SMEs, where the risk of bankruptcy is important, tax advantages are minimal from where a less recourse to the bank debt.

The volatility of corporate earnings has a significant influence only for to the services sector. This implies that SMEs investing in this type of activity are riskier than industrial SMEs. It should be noted that a significant proportion of SMEs in the services sector invest in trading activities, real estate, tourism and communications. They are more exposed to fluctuations of the economic conjuncture than the industrial companies. Especially as, these activities are unstable and face very strong competitions. As a result, banks are vigilant to finance such companies whose generated flows are very volatile.

The positive relationship between growth opportunities and bank debt ratio supported by agency theory is not verified for SME's service providers. Indeed, banks consider that growth opportunities increase the conflicts of interest, and lending to risky firms support further the increase of the risk of asset substitution. Investment in this kind of activities which are difficult to evaluate and to control, give leaders a flexibility that allows them to undertake riskier projects than those as originally announced to creditors. The latter anticipating such behavior, are

unable to estimate the growth rate of these intangible activities by tangible parameters such as total assets. Therefore, banks are based on other criteria, to analyze the financial situation of the company.

The agency theory also supports a positive correlation between the proportion of fixed assets and bank debt. Guarantees present a necessary condition to get a bank loan for industrial SMEs. The latter, investing in tangible activities have a significant amount of tangible assets that serve as relevant indicators to limit the agency conflicts between managers and creditors, and thus favoring the granting of credit.

The profitability of the company is negatively associated with the bank debt for all estimations. This implies that SMEs use external financing only when they exhaust their internal resources, thereby establishing a hierarchical order of financing (Mateev et al., 2013). Besides, the commercial debts affect financing of SMEs without distinction of business sectors. This variable seems to be decisive in determining the structure of bank debt. The negative impact of supplier's debts on bank debt supports that companies rationed by banks increase their commercial debts to face liquidity constraints (Petersen & Rajan, 1994). The liquidity variable is significant only for industrial SMEs. According to signal theory, holding company of surplus of resources favors the granting of bank credits. These liquidities reflect the financial situation and the reliability of industrial SMEs.

The study of financial behavior by business sectors shows some differences related to the investment in a well-defined activity. Banking institutions are based on some tangible parameters in the granting of credit for industrial SMEs, such as guarantees, growth opportunities and liquidity of the company. Due to the high costs of failure and the costs of agency associated with lending to SMEs, offer guarantees as fixed assets is a necessary condition in the access to bank credits. The volatility of earnings generated seems decisive in the sector of services. This business sector is characterized by activities which are difficult to control by banks and more susceptible to the fluctuations of economic conditions. This sensitivity to macroeconomic fluctuations increases the constraints of access to the bank debt and thus favors their rationing on market of bank credits. In spite of the diversity of the activities, some determinants of the debt remain the same for both sub-samples, including financial interests, profitability and commercial debts. These three parameters appear of a major importance in determining the debt ratio SMEs. These companies are characterized by a high risk of failure because of their small and fragile structure, thus they establish a hierarchy in the choice of financing, preferring to be financed first by internal resources. Besides internal funds, commercial debts appear as a full means of financing by substituting bank debts which are difficult to obtain for all SMEs in our sample, and verifying thereby the hypothesis of credit rationing that they suffer from.

6. Conclusion

Our econometric study on a sample of 611 Tunisian SMEs over the period from 2004 to 2009 tried to test the relevance of the predictions of theories intended for large enterprises, applied to the specificities of financing of SMEs. The originality of our work consists in the identification of indicators of the bank debt of Tunisian SMEs, insofar as the majority of previous works are not interested in the Tunisian fabric, and if this is the case, the interest is focused on either listed companies, or on all Tunisian companies regardless of the size and the financial specificities of SMEs.

We tested a set of hypotheses from the various theories that might explain the financial behavior of companies. According to theoretical and empirical works studying the issue of corporate finance, we used the econometrics of panel data to examine the capital structures of SMEs. The estimation results show that bank debt is dependent on some financial determinants which direct the financing policy in SMEs. We specify that our objective was not to compare the adequacy of theoretical prescriptions in large companies to those in SMEs. Our objective is to find a positioning of small businesses in the theoretical framework mentioned. We come to explain the financial structure of SMEs supporting the impact of financial expenses, rigid assets reported as guarantees, growth opportunities, profitability   and supplier credits. The analysis by business sector, does not modify the results in a consequent way, but underlines a bigger fragility of debt in SME's service providers. These companies are more risky, since they are more exposed to changes in economic conditions. Their activities are not easily assessable and controllable by banking institutions. This sensitivity to macroeconomic fluctuations increases the difficulties of access to bank debt and thus promotes their rationing on the credit market. By referring to formulated hypotheses, we deduce that the theory of Trade-Off, agency theory, signal theory and pecking order theory are rather validated in the sector of industries. However, for SME's providers of services, agency and signal hypotheses are not able to explain the financing choices. Despite a diversity of business sector, financial interests, profitability and commercial debts remain crucial determinants of bank debt in SMEs. These three variables interact in the sense of reducing the debt ratio, which highlights the limited use of debt in SME's. As a result, they follow a hierarchy in their financial choice by focusing first on internal funds, the least sensitive to information asymmetry, and then on commercial

debts.

The results of this work are a real contribution to the understanding of financial behavior of Tunisian SMEs, but rest subject to some limitations associated with the constraints imposed in the realization of this study. Further research could refine these results. First, by requesting for example a dynamic model that can take into account a possible endogeneity of the explanatory variables. Such estimation requires a long panel and sophisticated measurement tools. Then, by the consideration of the position of the company in its life cycle.

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Notes

Note 1. Innovation et stratégie entrepreneuriale en Tunisie, Mars 2010. Retrieved from http://www.oecd.org/mena/investment/44936067.pdf

Note 2. See Article 2of Decree No.2008-388 of 11 February 2008 published in JORT No. 15 of 19 February 2008.

Note 3. Information extracted from the balance sheets of companies do not allow us to measure the costs associated with the debt. Only the financial costs can be determined from the interest paid (Ziane, 2004).

Note 4. The absence of multicollinearity of the explanatory variables and the risk of error autocorrelation is checked for both subsamples.

Note 5. The calculation of the variable INT has sometimes illogical and very high values. Referring to the work of Perez (1998), we limited the results by choosing upper limit of 0.5.

Appendix A. Descriptive statistics of explanatory variables

Variables	Average	Standard deviation	Minimum	Maximum
ENDT	0.2816	0.2514	0	3.94
INT (Note 5)	0.1799	0.1542	0.001*	0.5
CROIS	0.0343	0.1001	-1.2128	0.6688
GART	0.5764	0.4932	0	3.7353
RSQ	0.0997	0.5799	-1.3429	2.9754
RENT	0.0656	4.8659	-155.1802	168.9713
DCOM	0.27	0.2070	0	1.9013
PROF	0.0301	0.1233	-1.7525	3.3120
LIQ	0.19	3.3183	-105.4997	125.6937
TAIL	21.9992	2.5485	6.3386	32.0442

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