The Determinants of Capital Structure: The Case of Moroccan Firms

Réda Louziri

Ph.D Candidate at the Mohammed V University of Rabat,

Faculty of Legal, Economic and Social Sciences- Souissi

Abstract

This article explores the different determinants of the capital structure in the Moroccan stock market. Panel data regressions were used to investigate the capital structure determinants in Casablanca stock market during the period 2009 to 2013. All the regressions incorporated four major variables that have led to significant results. These variables are size, profitability, dummy variable for financials and growth. Moreover, a new variable related to ownership structure has been considered in this article. By introducing the ownership variable, we would test if firms hold by parent groups, which control bank subsidiaries, profit from easier access to debt. Different proxies will be defined for ownership such as continuous and dummy variables. The main finding is that the ownership variable is insignificant while using continuous or dummy variables. We observe that even by using several proxies, we still find insignificant levels. Moreover, all the coefficients for this variable present a negative sign. This means that the Moroccan firms owned by parents companies, that control bank subsidiaries, do not benefit from the easier access to debt. These results can be interpreted as a good signal of the governance of the Moroccan firms.

Keywords: capital structure, ownership structure, pecking order theory, trade off theory

1. Introduction

The capital structure choice has always been one of the main theoretical and empirical subjects in the field of finance since Modigliani and Miller (1958) published their article: "the cost of capital, corporate finance and the theory of investment". This paper questioned the relevance of the capital structure decisions. Their main finding is the irrelevance of the capital structure in determining the firm value. From this point, several papers have been published to investigate empirically the main theories using different methods in various markets.

The four main theories that shape the capital structure are the pecking order, the trade off, the market timing theory and the agency theory. Empirically, every one of these theories presents some evidence but also has its own limits.

This paper will begin by the literature review section in order to give the basis to debate the results found in this paper. Then, the model and the hypothesis will be described. After this section, the data and its measurements will be discussed. The following section is the methodology, which will be followed by the analysis and the results section.

2. Literature Review

2.1 Modigliani and Miller's proposition

Modigliani and Miller (1958) have written the basis of any debate about the capital structure. According to them, the capital structure of a firm is irrelevant, as it does not have any impact on the value of the firm. However, once they have included the taxation in 1963, they found that the firm value is indeed sensitive to the level of debt if the interest payments are deductible. Therefore, they made a new proposition, which suggests that the firm value is equal to itself, if it is entirely financed by equity, plus the present value of the tax shield. In other words, the firm value would be maximized when the financing is all by debt.

2.2 The tradeoff theory

The idea of the tradeoff theory has been introduced by Kraus and Litzenberger (1973) and has been further developed by Myers (2001). The main idea of this model is that profitable firms should increase their leverage until the marginal profit from debt is equal to bankruptcy marginal cost. Indeed, firms would raise their benefits by issuing more debt because of the deductibility of the interest expenses. On the other hand, using equity funds does not provide this advantage because dividends are not deductible. However, increasing the leverage ratio would lead to raise the probability of financial distress because of the compulsory monthly payments of debt. Therefore, firms would have to find the optimal level of leverage. This theoretical level is reached when marginal benefit from debt is equal to the marginal cost of bankruptcy.

2.3 The pecking order theory

Myers and Majluf (1984) introduced the pecking order theory to explain the capital structure decision. The main basis of this theory is the problem of asymmetric information. Indeed, the managers would normally prefer to use the internal cash to avoid any adverse signal. Therefore, the pecking order theory conceptualizes a ranking of the use of funds. The most preferable funding is internal cash. Then debt funding is considered secondly. The least resort would be funding through equity.

2.4 The agency theory and empirical evidence

Debt might be viewed as a mean to control managerial investment decisions. Indeed, the monthly payment of debt should decrease the agency costs by diminishing the misuse of cash as indicated by Jensen and Meckling (1976). However, the conflict of interest would rise between shareholder and debtholders when the firm is distressed as presented by Flannery and Rangan (2006). In this case, the managers might gamble because they know that they could lose all the remaining value for the debtors. Besides, the shareholders might refuse to issue equity to finance safe projects that would increase the firm and bondholders' values instead of the shareholders' value.

2.5 The market timing theory

Baker and Wurgler (2002) suggested the market timing theory to explain the managerial decisions relative to the capital structure choices. The main point of this model is to understand if the capital structure depends on the stock returns of the firm rather than the firm's characteristics.

3. The Sample Choice and the Variables

The sample includes 73 firms observed over a 5 years period ranging from 2009 to 2013, which gives more than 354 observations. All the data has been gathered from Bloomberg except the ownership variable, which was not available in the databases. Therefore, I have used the data provided by the official website of the Moroccan market: www.casablanca-bourse.com. Moreover, because the available data about ownership structure is provided for 2013 only, we have assumed that this ownership structure is the same for the rest of the 5 years period knowing that the floating capital in the Casablanca stock market is less than 20% and the principal owners do not vary significantly.

The Moroccan market is under studies. It is my contribution to investigate which are the main capital structure determinants in this market.

The following table presents the variables, their measurements and the predictions.

Table 1: Summary of the different variables, their measures and the predictions of their relationship with leverage

Variable	Proxies	Predictions of the correlation between each variable and leverage ratio			
		Trade off	Pecking Order	Agency Theory	Market Timing
Leverage	Total Debt / (Total Debt + Market Capitalisation) ; Total Debt / (Total Debt + Equity Book);				
Industry median	The industry median leverage	+			
Size	Log of Total Assets	+	+	+	
Profitability	EBITDA / Total Assets	+	-		
Tangibility	Net Plant Property and Equipment / Total Assets	+	+	-	
Financials	Dummy variable: 1 for financials and 0 otherwise				

Returns	Total return yearly return in the Moroccan stock market				-
Taxation	The effective tax rate	+			
Ownership	Continuous variable for ownership: total percentage of ownership; Dummy variable for ownership using a minimum for ownership: 50%, 15%, 10%, and 8%: - 1 if is higher than the minimum level of ownership and 0 otherwise				
Growth Opportunities	Price to Book ratio	-	+	-	-

4. Methodology

The first regression is conducted by using the first debt ratio: Debt1 = Total Debt / (Total Debt + Market Capitalization) and the continuous variable for ownership. Then, four regressions were run using the same debt ratio and four proxies for the ownership variable. Indeed, I used four dummy variables for ownership with 1 for more than X% of ownership and 0 for less (X = 50%; 15%; 10%; 8%).

I conducted then a robustness tests to corroborate the findings, by first using first a regression with a second leverage ratio: Debt2 = Total Debt / (Total Debt + Book Equity) and continuous variable of ownership. Then, four other regressions were run using the same leverage ratio and four dummy variables for ownership with 1 for more than X% of ownership and 0 for less (X = 50%; 15%; 10%; 8%).

5. Empirical Results

5.1 Regression results

Table 2: Regression results using the first proxy of debt (Total Debt / (Total Debt + Market Capitalisation))

Dependent variable: Debt1 Independent variables:	Coefficients (Betas)	z	P>z
Industry_Median	0.1253	1	0.317
Size	0.0945	3.64**	0.000
Profitability	-0.5811	-3.64**	0.000
Tangibility	0.14208	2.61**	0.009
Dummy_Financials	0.2218	3.56**	0.000
Return	-0.00003	-0.23	0.818
Tax	0.00008	0.41	0.683
Ownership	-0.1630	-1.75	0.081
Growth	-0.0309	-6.19**	0.000
Constant	-0.5641	-2.4*	0.016
R-2 Overall	0.4722	F-Test	150.20**
		Prob (F-Test)	0,0000

This regression is conducted by using random effect model (GLS). The significant results are followed by one star * if it significant with α = 5% error and two stars ** if it is significant with α = 1%.

In this regression, the dependent variable is calculated as leverage ratio = Total Debt / (Total Debt + Market Capitalisation). The independent variables are the industry median, size (Log of total assets), profitability (EBITDA / Total Assets), tangibility ((Net Property, Plant and Equipment) / Total Assets), Dummy for financials, return (yearly total stock return), tax (effective tax rate), growth opportunities (price to book ratio) and continuous variable for ownership.

The first significant variable is size that presents a positive significant relationship with leverage. The tradeoff theory, based on Myers (2001), argues that big firms have low possibility of default and low volatility because they are more diversified and mature than smaller firms. Besides, the agency theory would expect larger firms to have less adverse signal issues

than smaller firms as indicated by Fama and French (2002). The pecking order model explained by Myers and Majluf (1984) supports that larger firms are more mature and well followed by the analysts, which reduces the adverse selection problem.

The second significant variable is profitability. These results are predicted by the pecking order theory presented by Myers and Majluf (1984) because most profitable firms would prefer to use internal cash before using any external resources due to the problem of asymmetric information. However, the tradeoff theory presented by Myers (2001) expects the opposite relationship because profitable firms would tend to issue more debt in order to benefit from the tax shield. Several studies have already criticized this weakness about the tradeoff theory because of the negative relationship between profitability and leverage as indicated by Myers (1984), Wald (1999) and Fama and French (2002).

Tangibility variable is also significant. The trade off and the pecking order theories did both expect a positive correlation. Based on the tradeoff model by Myers (2001), firms in an industry with higher level of tangible assets would be able to issue more debt as they can use these assets as collateral for loans. The pecking order theory predicts also a positive relationship between tangibility and leverage. Firms with higher level of tangible assets will suffer less from asymmetric information and might use it as collateral to issue debt before equity as revealed by Myers and Majluf (1984). On the other hand, the agency theory presented by Jensen and Meckling (1976) and Jensen (1986) is the theory that expects a negative correlation.

The dummy variable for the financial firms provided significant results. I have introduced this variable to control for the financials because I did not exclude them from my sample.

The ownership variable presents insignificant results (with α = 5% or α = 1%). I have used a continuous variable for the ownership variable in this first case. This could be an indicator about the good governance of the Moroccan firms. Indeed, firms held by parent groups, that control banks, do not benefit from an easy access to debt compared to the other firms in the stock market.

Alternative explanations might be provided to explain this finding. As a matter of fact, firms that belong to powerful holding firms might follow the strategy defined by the group to use equity and internal cash first. Indeed, these groups, that hold also bank subsidiaries, might follow the pecking order theory or the signaling model to avoid any adverse signal.

The growth (P/B) is a significant variable with a negative relationship. The tradeoff model presented by Myers (2001) has predicted this negative correlation between growth and leverage, because firms with high growth tend to have lower level of tangibility, which reduces the use of debt. Furthermore, the agency theory, as explained by Jensen (1986), supports this result as shareholders have more opportunities to invest when they control growth firms, which allows them to make investments that could increase their value and decrease the value of debtholders. This conflict of interest might explain the negative correlation between P/B and leverage.

On the other hand, the pecking order theory expects the opposite relationship. Myers and Majluf (1984) support the fact that firms with higher price to book ratios present less adverse selection problem. Therefore, managers would issue equity first then debt to avoid the problem of asymmetric information.

5.2 Regressions results using different measures of ownership

Table 3: Regression results of debt, using various measures of ownership

Dependent variable Debt1 Independent variables:	Ownership (>50%)			Ownership (>15%)			Ownership (>10%)			Ownership (>8%)		
	Betas	z	P>z	Betas	z	P>z	Betas	z	P>z	Betas	z	P>z
Industry_Median	0.1450	1.17	0.242	0.1471	1.16	0.245	0.1444	1.15	0.251	0.1525	1.23	0.218
Size	0.0899	3.49**	0.000	0.0947	3.59**	0.000	0.0950	3.61**	0.000	0.0950	3.64**	0.000
Profitability	-0.5733	-3.59**	0.000	-0.5871	-3.68**	0.000	-0.5880	-3.68**	0.000	-0.5856	-3.67**	0.000
Tangibility	0.1401	2.58*	0.01	0.1350	2.48*	0.013	0.1367	2.51*	0.012	0.1395	2.57*	0.01
Dummy_Financials	0.2273	3.6**	0.000	0.2095	3.34**	0.001	0.2163	3.43**	0.001	0.2188	3.51**	0.000
Return	-0.00004	-0.29	0.772	-0.00004	-0.28	0.783	-0.00004	-0.25	0.803	-0.00003	-0.23	0.815
Tax	0.00007	0.4	0.689	0.00007	0.4	0.689	0.00007	0.4	0.689	0.00008	0.41	0.682
Ownership	-0.1134	-1.73	0.084	-0.0583	-1.08	0.281	-0.0645	-1.25	0.211	-0.0781	-1.6	0.11

Growth	-0.0308	-6.17**	0.000	-0.0309	-6.17**	0	-0.0310	-6.21**	0.000	-0.0310	-6.21**	0.000
Constant	-0.5366	-2.29*	0.022	-0.5766	-2.42*	0.016	-0.5751	-2.42*	0.015	-0.5724	-2.43*	0.015
R-2 Overall	0.4762			0.4591			0.4617			0.4685		
F-Test	149.99**			146.44**			147.35**			149.27**		
Prob (F-Test)	0.0000			0.0000			0.0000			0.0000		

This regression is conducted by using random effect model (GLS). The significant results are followed by one star * if it significant with α = 5% error and two stars ** if it is significant with α = 1%.

The dependent variable is calculated as leverage ratio = Total Debt / (Total Debt + Market Capitalisation). The independent variables are the industry median, size (Log of total assets), profitability (EBITDA / Total Assets), tangibility ((Net Property, Plant and Equipment) / Total Assets), Dummy for financials, return (yearly total stock return), tax (effective tax rate), growth opportunities (price to book ratio) and dummy variable for ownership with 1 for more than X% (>50%; 15%, 10%, 8%) of ownership and 0 for less.

The results obtained from table 2 provide the same significant and insignificant variables as in the first regression (table 5). Indeed, all the significant variables in the first regression remain significant in these four regressions. These variables are: size, profitability, tangibility, dummy for financials and growth. Moreover, the signs remain the same in all regressions.

For the ownership variable, we observe that even when we used several measures, we find again insignificant levels. This finding could mean that the Moroccan firms, owned by parent groups that control bank subsidiaries, do not take advantage of easy access to bank debt. These results can be interpreted as a good signal of the governance of the Moroccan firm as stated before.

6. Robustness Tests

When I used the book values for equity to calculate the debt ratio (Total Debt / (Total debt + Book Equity)), I have found approximately the same significant variables as in the previous regressions that used Debt1 proxy for leverage except for the tangibility variable. Indeed, the significant variables are size, profitability, dummy for financials and growth. Besides, the ownership variable is still insignificant in all regressions.

Nevertheless, as far as the growth variable is concerned, the relationship changes to a positive correlation. The only theory that supports this result is the pecking order theory. Indeed, Myers and Majluf (1984) suggest that firms with higher price to book ratios present less adverse selection problem. Therefore, managers would issue more equity than debt to avoid asymmetric information problem. Moreover, this change in the relationship can be explained by the fact that when we use market values for debt ratio, the market value of equity is in the denominator of the Y variable and in the nominator of the market to book ratio. On the other hand, when we use book value for debt ratio, the book value of equity is in the denominator of the Y variable, and in the denominator of the market to book ratio.

7. Conclusion

Through this research, we tried to investigate the principal determinants of capital structure in the Moroccan stock market.

The first finding is the insignificant results of the ownership variable. Thus, by using different variables for ownership and two proxies for leverage, we found that there is not enough statistical evidence to think that firms, held by groups which control banks, benefit from an easier access to debt. Indeed, I used a continuous variable for ownership to begin with, then, I conducted four other regressions using four dummy variables for the ownership. In addition to that, we found a negative correlation instead of the predicted positive relationship. Thus, we might interpret this result as a good signal of the governance of the Moroccan firms.

Besides, four independent variables present significant results in all the regressions. These variables are size, profitability, dummy for financials and growth.

To investigate even more the capital structure determinants in the Moroccan market, further studies could be conducted. Indeed, the future papers might examine this research question by using a sample that does not include the financial firms.

To summarize, we can suggest that there is no evidence that one theory is the predominant among all the theories. Indeed, the tradeoff model, the pecking order model and the agency theory present some significant evidence and limits. On the other hand, the market timing theory did not provide significant results in all regressions.

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