

The impact of capital structure on Firms performance in Morocco

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ABSTRACT

The paper employ Panel regression approach to investigate the impact of capital structure on firm's performance in Morocco, Based on the result of Hausmann test, fixed effect fit the first model better, thus it was utilized to examine the relationship between capital structure and firms performance. The annual data was collected from Moroccan authority of capital market and Casablanca stock exchange official website; it covers a period of three years from 2014 to 2016 of 53 Moroccan companies. The results of this research conclude a significant effect of three explanatory variables out of three, debt ratio (DR) has negative significant effect on return on asset (ROA), debt equity ratio (DER) has negative and significant impact on return on equity (ROE) and size has positive significant impact on firm performance using return on equity (ROE) as proxy. Therefore, the profitability of Moroccan firms decrease as much as level of leverage increase, Trade-off theory which assume a positive relationship between capital structure and firms performance is reject, financial risk of Moroccan companies is very high, as a consequence external financing should be reduced to improve the financial performance.

Keywords: capital structure, performance of Moroccan firms, Trade-off theory, Panel regression

1. INTRODUCTION

The operating environment of companies is very competitive nowadays, Firm's performance is the target of all managers and many researchers will always shed light on it, business policy literature emphases that there are two major streams of research on the determinants of firm performance, the first is the economic tradition which is about the importance of external market factors in determining firm success, the second way is based on behavioral and sociological paradigm and sees organizational factors and their fit with the environment as the major determinants of success. Our research will focus on the second way of determining firm's performance, our research focus on financial angle of performance; we will investigate the impact of capital structure on firm's performance.

Capital structure is one of the most important effective parameters on the valuation and direction of economic enterprises in the capital markets, The mean goals that managers should consider to maximize shareholders wealth is determination of the best combination of financial resources for the company, the relationship between capital structure and firm performance has received considerable attention in the finance literature, it started from Modigliani and Miller in 1958 until nowadays, Researchers pointed out that the impact of capital structure on firms' financial performance has continued to keep researchers pondering. Hence, this paper attempts to investigate the relationship between capital structure and Moroccan firm's performance.

Many approaches have been developed, among which, in recent years, productivity and efficiency analyses as well as different types of profitability ratios have become highly important in the characterization of a company's performance. However, although the single output to input ratios, such as returns on investment (ROE) and return on Asset (ROA) may be used as indices to characterize financial performance, conventional referents of performance, whether they are measures of profitability, productivity or efficiency. Recently, many researchers used return on asset (ROA) as proxy to financial firm performance, Ahmed Sheikh, Nadeem Wang, Zongjun (2013) used it on their research on the impact of capital structure on firms performance in Pakistan, also Ramadan, Zeyad Saleem Ramadan, Imad Zeyad (2015) used return on asset (ROA) to investigate the Capital Structure and Firm's Performance of Jordanian Manufacturing Sector. Capital structure theory refers to a systematic approach to finance business activities through a combination of equities and liabilities, competing capital structure theories explore the relationship between debt financing, equity financing and the market value of the firm.

T. Lemma, Tesfaye Negash, Minga (2014) investigated the determinants of the adjustment speed of capital structure bringing evidence from developing economies by using debt ratio, Bo Liu (2017) have builds a novel learning model by incorporating information incompleteness to extend the traditional capital structure tradeoff theories, they found that

myopic agents without learning will make a more conservative debt policy. Ahmad, Abdullah and Roslan, (2012) investigated the impact of capital structure on firm performance by analyzing the relationship between operating performance of Malaysian firms, measured by return on asset (ROA) and return on equity (ROE) with short-term debt (STD), long-term debt (LTD) and total debt (TD). The study found STD and TD to have a significant relationship with ROA and ROE. However, the analysis with lagged values shows that none of lagged values of STD, TD and LTD has a significant relationship with performance. Gleason, Kimberly C Mathur, Lynette Knowle Mathur, Ike (2000) analyze the interrelationship between culture, capital structure, and performance: evidence from European retailers, they have measured capital structure by total debt to total asset ratio (TD/TA) and got as resulting a significant impact. Ramadan, Zeyad Saleem Ramadan, Imad Zeyad (2015) research results that there was statistically significant inverse effect of capital structure, expressed by long-term debt to capital ratio, total debt to capital ratio and total debt to total assets ratio, on the performance of the Jordanian industrial companies listed at ASE expressed by Return on asset ratio (ROA).

2. LITERATURE REVIEW

Advocates of optimal capital structure argue that judicious combination of debt and equity maximizes the value of a firm. There are dissenting views of scholars on what constitute optimal capital mix and its effects on a firm's financial performance. Modigliani and Miller (1958) claim that under perfect market conditions, a firm's value depends on its operating profitability rather than its capital structure. In 1963, Modigliani and Miller (1963) fix the previous paper; argue that, when there are corporate taxes then interest payments are tax deductible, 100% debt financing is optimal. This means that the firms' value increases as debt increases. Champion (1999); Ghosh (2000); Hadlock and James(2002) investigations also lead to a positive relationship.

Other studies showed contradictory results from the relationship between increased use of debt in capital structure and firms performance. Simerly and Li (2000) Booth et al (2001) Ibrahim (2009) showed negative or weak/no relationship between firms performance and leverage level. In a study of listed firms in Ghana, Abor (2005)[6] found that short-term and total debt are positively related to firms ROE, whereas long-term debt is negatively related to firms. While examining the relationship between capital structure and performance of Jordan firms, Seitun and Tian (2007) found that debt level is negatively related with performance (i.e ROA and ROE) and Abor (2007)[7] on small and medium – sized enterprises in Ghana and South Africa showed that long –term and total debt level is negatively related to performance. As study by Ibrahim El- Sayed Ebaid,(2009) based on a sample of non-financial Egyptian listed firms from 1997 to 2005 reveals that capital structure choice decision, in general terms, has a weak-to no impact on firm's performance. Results of some studies [15][14] showed that capital structure is not the only way to explain financial decisions. Probably this explains the contradictory results of the studies that empirically tested the predictions of relationship between leverage and firm's performance. As explained by Jermias (2008), only the direct effect of financial leverage. Performance is examined by prior studies however leverage- performance relationship may be affected by some other factors like competitive intensity and business strategy.

Table 1 : the relationship between capital structure and firms performance

Theory	Relationship	Causality
Trade-off	Positive	Debt affect performance
Pecking-Order	Negative	Debt affect performance

Based on capital structure theory and firms performance, the previous table illustrates a summary of the relationship between capital structure and firms performance. The previous table was taken from Master of Finance Economics Thesis, Iavorskyi, Mykhailo (2013) have investigate the impact of capital structure on firm performance in Ukraine.

3. DATA AND METHODOLOGY

a. Data collection method

Panel data analysis is conducted which relating its time series to the cross sectional data. In each cross section, it is produced an intercepts and the score of coefficient from different slopes in each observation period (Wooldridge, 2013). Yearly based data from 2014 to 2016 is collected from two basic sources, Moroccan authority of capital market and Casablanca stock exchange. All active and currently operating firm were selected except financial firms. There are 75 firms listed in Casablanca stock exchange in total, there are 18 financial firms, two firms are inactive and two firms do not provide financial statement for the years studied, therefore the final sample include 53 firms.

b. Method of the study

This research utilizes return on asset (ROA) and return on equity (ROE) to measure firms performance as dependent variable, while independent variables in this research are the capital structure specifics, such as: debt ratio , debt equity ratio and control variables which are: size and industries.

c. The dependent variable

Return on Asset (ROA) is the most scale used in researches as proxy to profitability, and calculated as:

$$ROA = \text{Net income} / \text{Total asset} \quad (1)$$

the financial risk of a determined company is affected by its profitability, the profit of a company as much as it is high as much as allowing an auto-finance of activities, the profit of a company also decrease the possibility of borrowing, thus minimize the dependence on the possibilities of an external sources of financing. Therefore, the profitability determines the ability of a company to survive. There is two opposite theory determining the relationship of the capital structure and the performance of a company, Trade-off Theory assume that there is a positive relationship between capital structure and profitability of a firm in one hand, in the other hand there is Pecking order Theory arguing that the relationship between capital structure and performance is negative.

Return on Equity (ROE) is also one of most financial ratio used in the research, it used as a proxy of companies' profitability, and calculated as:

$$ROE = \text{Net income} / \text{Average of shareholders' equity} \quad (2)$$

This ratio indicate the profitability of a company by comparing the net income of a given company to the average of shareholders equity, the return on equity ratio measure how much the shareholders earned for their investment in the company, the more higher the ratio more efficient the management is utilizing its equity base and better return to investments. Financial analysts consider return on equity ratios in the 15-20% range as representing attractive levels of investment quality.

a. The independent variables

Variables to express the capital structure of a company are as follows:

Debt ratio employed to measure the extent of a company's leverage, this ratio help to determine the proportion of company's asset financed by debt. The higher the ratio is, the higher the leverage, thus as a consequence higher financial risk. Debt ratio is calculated as:

$$DR = \text{total liabilities} / \text{total asset} \quad (3)$$

Total debt equity ratio is a measure to company's financial leverage, it compare debt to equity of the company, This is a measurement of how much suppliers, lenders, creditors and obligors have committed to the company versus what the shareholders have committed. Debt equity ratio can be calculated as:

$$DE = \text{total liabilities} / \text{total shareholders' equity} \quad (4)$$

Size variable indicate the classification of the companies and how large the total asset is of the companies, this control variable may have an impact on financial performance. It obtained by the logarithm of total asset:

$$SIZE = \text{Log}(\text{total asset}) \quad (5)$$

Industries is used as control variable, the structure of the capital can be different depending on the industry where the firm operate, therefore this independent variable may have an impact on firms performance, we have classify the industries by giving code to each industry

3.5 Econometric model

This research seeks to investigate the effect of Moroccan firm's capital structure on its market value by employing Panel least square estimator framework. The regression model can be written as follow:

$$ROA = \alpha_i + \beta_1 DR_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \beta_4 IND_{it} + \epsilon_i \quad (6)$$

$$ROE = \alpha_i + \beta_1 DR_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \beta_4 IND_{it} + \epsilon_i \quad (7)$$

Where is:

ROA: return on asset

ROE: return on equity

α : intercept

β : coefficient of independent variable

DR: Total liabilities to total asset ratio

DER: Total debt to shareholders equity ratio

SIZE: Logarithm of total asset ratio

IND: classification code of companies by industry

ϵ : Error terms

i: total number of companies

t: total number observation for each company

4. EMPIRICAL RESULTS

a. Descriptive analysis

The results of descriptive analyze are shown in the table 1 bellow:

Variable	Mean	Std. dev	Min	Max
DR	.3956796	1.411714	-17.05182	1.158404
DER	1.478302	39.47392	-32.56	496.6
SIZE	20.89176	1.601096	16.64869	24.46055
ROE	-.0571528	2.270596	-28.143	3.3938
ROA	.0959226	.3548283	-.5773377	4.099413

Table 2: Descriptive statistics

Note: ROA Firms’ performance defined as net income to total assets, DR is total liabilities to total asset ratio, DER is total liabilities to shareholders equity ratio, Size is logarithm of total asset, ROE is net income to average shareholders’ equity.

The performance expressed by return on asset (ROA) has an average of 9.5 %, which mean Moroccan companies have a medium ability to convert the money invested to net income, it has with a standard deviation of 0. 3486. The return on equity (ROE) has a negative mean of 0.057, thus the return of shareholders’ investment in Moroccan company is mediocre , the maximum return on equity is 3.39 in 2015 belonged to engineering industry, in that sector the company ‘STROC industry’ had -71747350.77 MAD as net income and the average shareholders’ equity was -25695676.81 MAD. The minimum return on equity is -28.14 in 2015 belonged to Forestry and paper industries made by “ Med paper” company due to its devaluation of shareholder equity value reduced from 21001855.00 MAD to 720647.98 MAD while its net income value was negative value of -20281207.94 MAD.

Also the table 1 show that almost the half of firm’s asset is financed by debt, the average of 40% is the proportion of total debt financing total asset of Moroccan firms. Debt equity ratio (DER) have an average of 1.47 which means the debt value is bigger than shareholders equity value by almost 50%, the maximum of debt equity ratio is 496.6 point due the devaluation of shareholders equity value of “Med Paper” company operating in Forestry industry and the minimum debt equity ratio (DER) is -32.56 due to a negative devaluation of “Stroc industry” company’s equity operating in engineering industry.

As conclusion of Descriptive statistic analysis of 53 Moroccan companies operating in 15 different industries , we can conclude that the financial performance of the companies low to medium performance by using return on asset and return on equity as proxy to performance, the average of total companies are financing there total asset by 40% of debt.

a. Regression analysis

The regression results of econometric model (equation 6) are shown in table 3 and table 4:

Number of obs	F(4, 154)	Prob > F	R-squared	Adj R-squared	Root MSE
159	177.93	0.0000	0.8221	0.8175	.15159

Table 3: Summary of the model1

Based on table 3, Adjusted R-squared is 0.81 that mean 81% of dependent variables is explained by explanatory variables of the model

ROA	Coef.	Std. Err	t	P> t	[95% Conf. Interval]		VIF
DR	-.2270806	.0089021	-25.51	0.000	-.2446666	-.2094946	1.09
DER	-.0000225	.0003063	-0.07	0.942	-.0006275	.0005825	1.07
SIZE	-.0055406	.007805	-0.71	0.479	-.0209593	.0098781	1.02
IND	-.0024029	.0022484	-1.07	0.287	-.0068446	.0020389	1.00
_cons	.3235235	.1625696	1.99	0.048	.0023693	.6446778	Mean= 1.05

Table 4: regression results 1

Multi-collinearity does exist if one of VIF value of independent variables is equal to zero, but if it is less than 10 that mean multi-collinearity exist but ignorable. Our results of collinearity test of independent variables are less than 10;

hence the results show no multi-collinearity problem among independent variables. Thus, all the independent variables utilize in this research.

To investigate the relationship between capital structure and firm performance in Morocco, Panel least square is used to analyze it. Return on asset is employed as proxy for firm performance and it is a dependent variable.

Based on table 3, it indicated that out of four independent variables: Debt ratio, debt equity ratio, size and industry, there is only one independent variable having significant impact on firm performance, this explanatory variables are Debt ratio (DR), however Debt to equity ratio (DER), Size, industry (IND) have no significant relation with firms performance measured by Return to asset (ROA). hence, the level of leverage of company expressed in debt ratio has impact on financial performance of Moroccan firms, the impact of debt ratio (DR) on return on asset (ROA) is negative, it means there is inverse relationship between debt ratio (DR) and return on asset (ROA), higher debt lead to less profit.

The regression results of econometric model (equation 6) are shown in table 5 and table 6:

Number of obs	F(4, 154)	Prob > F	R-squared	Adj R-squared	Root MSE
159	1565.21	0.0000	0.9760	0.9754	.35635

Table 5: Summary of the model 2

Based on table 5, Adjusted R-squared is 0.81 that mean 81% of dependent variable is explained by explanatory variables of the model

ROE	Coef.	Std. Err	t	P> t	[95% Conf. Interval]		VIF
DR	.4024042	1.385263	0.29	0.772	-2.334166	3.138975	1.09
DER	-5.717216	.0476572	-119.97	0.000	-5.811362	-5.62307	1.07
SIZE	2.548476	1.214543	2.10	0.038	.1491606	4.947791	1.02
IND	.2536095	.3498762	0.72	0.470	-.4375667	.9447858	1.00
_cons	-36.20577	25.29755	-1.43	0.154	-86.18078	13.76924	Mean= 1.05

Table 6: regression results 2

To investigate the relationship between capital structure and firm performance in Morocco, Panel least square is used to analyze it. Return on equity is employed as proxy for firm performance and it is a dependent variable.

Based on table 3, it indicate that out of four independent variables: Debt ratio, debt equity ratio, size and industry, there is two independent variable having significant impact on firm performance using return on equity (ROE) as proxy, those explanatory variables is Debt equity ratio (DER) and size, however Debt ratio (DR) and industry (IND) have no significant impact with firms performance measured by Return to asset (ROE). hence, the level of leverage of company expressed by debt equity ratio have impact on financial return on shareholders' investment, the impact of debt equity ratio (DER) on return on equity (ROE) is negative, it means there is inverse relationship between debt equity ratio (DER) and return on asset (ROE), higher debt lead to less profit. There is a positive impact of size's companies on their performance in term of return on equity (ROE), bigger size higher profit for shareholders'.

5. CONCLUSIONS

This study aims to investigate the impact of capital structure on firms' performance in Morocco, the data was taken from Moroccan authority of capital market official website and Casablanca stock exchange official website, the period of study is from 2014 to 2016 and the sample of the study is all active companies listed on Casablanca stock exchange except financial companies.

The total sample include 53 Moroccan companies operating in 15 different industries , based on descriptive statistic we can conclude that the financial performance of the companies is low to medium performance by using return on asset and return on equity as proxy to performance, the average of total companies are financing there total asset by 40% of debt.

In order to achieve the objective of our study Panel least square regression model is used, the result of our investigation conclude a significant effect of capital structure on firms performance, whereas debt ratio (DR) and debt equity ratio (DER) were used as proxy to capital structure, size and industries were used as control variable, return on asset (ROA) and return on equity (ROE) were used as proxy to firms performance. In the first model regression we used return on asset (ROA) as proxy to firms' financial performance, the results conclude to a significant negative impact of the level of leverage on firms' profit, it illustrated by debt ratio obtained by comparing total liabilities to total asset. In the second regression model, we used return on equity (ROE) as proxy of firm performance, the results conclude to a significant inverse relationship between return on shareholders' equity and debt to equity ratio, hence the financial firms

performance is affected by the level of leverage, also in the second model we got a significant and positive impact of size on return on equity (ROE), hence, bigger the firm higher the profit.

Therefore, Trade-off theory which assume a positive relationship between capital structure and firms performance is reject, as consequence companies in Morocco should improve their ability in profitability by minimizing financial risk and dependence on external financial sources, The financial strategy of firms should adopt Pecking-order theory, which state that profitable firms rely less to external sources to finance their activities.

References

- [1] Ahmed Sheikh, Nadeem Wang, Zongjun, "The impact of capital structure on performance", *International Journal of Commerce and Management* , pp. 354-368, 2013.
- [2] AL-Taani, K. "The Relationship between Capital Structure and Firm's Performance", *Journal of Finance and Accounting*, pp 41-45, 2013.
- [3] Almeida, H., Philippon. T, "The risk-adjusted cost of financial distress". *J. Finance* , pp.2557–2586, 2007.
- [4] Akeem, Lawal BabatundeK, Edwin Terer, Kiyanjui, Monica Wanjiru Kayode, "Matthew Effects of Capital Structure on Firm's Performance: Empirical Study of Manufacturing Companies in Nigeria", *Journal of Finance and Investment Analysis*, 2014.
- [5] Arioglu, Emrah Tuan, Koray, "Speed of adjustment: Evidence from Borsa Istanbul", *Borsa Istanbul Review*, pp. 126-131, 2014.
- [6] J.Abor, "The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana", *Journnal of Risk Finance*. 6, 438-47, 2005.
- [7] J.Abor, "Debt policy and performance of SMEs: Evidence from Ghanaian and South Africa firms", *Journal of Risk Finance*, Vol. 8, pp. 364-79, 2007.
- [8] Ahmad, Z., Abdullah, M.A. & Roslan S. "Capital Structure Effect on Firms Performance: Focusing on Consumers and Industrials Sectors on Malaysian Firms", *International Review of Business Research*, pp.137 – 155. 2012.
- [9] Baltacı, N. & Ayaydn, "Firm, Country and Macroeconomic Determinants of Capital Structure: Evidence from Turkish Banking Sector", *EMAJ: Emerging Markets Journal*, pp. 47-58, 2014.
- [10] Chinaemerem, Osuji Casmir Anthony, and Odita, "Impact Of Capital Structure On The Financial Performance Of Nigerian Firms", *Arabian Journal of Business and Management Review*, pp 43-61. , 2012.
- [11] Cook, Douglas O.Tang, TianMacroeconomic conditions and capital structure adjustment speed, *Journal of Corporate Finance*, PP 73-87,2010.
- [12] Cortez, M.A. & Susanto, S. "The Determinants of Corporate Capital Structure: Evidence from Japanese Manufacturing Companies", *Journal of International Business Research*, 11, pp. 122-134, 2012.
- [13] Flannery, Mark J. Rangan, Kasturi, "Partial adjustment toward target capital structures", *Journal of Financial Economics*, vol. 79, issue 3, Page 469-506, 2006.
- [14] Fama, E. F., & French, K. R. "Testing tradeoff and pecking order predictions about dividends and debt", *The Review of Financial Studies*, 15,pp 1-33, 2002.
- [15] Forte, D., Barros, L.A. & Nakamura, W.T "Determinants of the Capital Structure of Small and Medium Sized Brazilian Enterprises", *BAR – Brazilian Administration Review*, 10 (3), pp. 347-369, 2013.
- [16] Gleason, K.C., Mathur, L.K. and Mathur, I. "The interrelationship between culture, capital structure and performance: evidence from European retailers", *Journal of Business Research*, Vol. 50, pp. 185-191, 2000.
- [17] Huang, Guihai Song, Frank M., "The determinants of capital structure: Evidence from China", *China Economic Review*, vol. 13, issue 1, pp 14-36, 2006.
- [18] Iavorskyi, Mykhailo, "The Impact of Capital Structure on Firm Performance: Evidence from Ukraine", *Master Of Finance Economics Thesis, Kyviv School of Economics*, pp 3-43, 2013.
- [19] Kouki, M. & Said, H.B. "Capital Structure Determinants: New Evidence from French Panel Data", *International Journal of Business & Management*, 7 (1).2012.