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The Impact of Leverage on Financial Performance of Tunisian Quoted Firms

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Abstract:

Purpose: *This study attempts to understand the relationship between financial leverage and financial perofmrance of Tunsian firms.*
Design/Methodology/Approach: *By appling a panel research method for a sample of 30 firms quoted in Tunsiian stock exchange for the period of 2016-2021.*
Findings: *The study found that leverage has a positive impact on ROA but negative impact on ROE.*
Practical Implications: *Financial leverage is important to meet the requirements of firms and increase the investments. Leverage indicates the possible probalbility of growth and the ambitions of the directors.*
Originality/Value: *Financial performance is necessary to ameliorate the management of the firm by increasing the revenues and decrease the expenses.*

Keywords: *Financial leverage, financial performance, firms, panel, ROA, Tunisian stock exchange, ROE.*

JEL Classification: *M40, M41, M42.*

Paper type: *Research article.*

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1. Introduction

Leverage is important to boost the capacity of firm to meet to his financial requirements and increase the investment. On the other hand financial performance is necessary to ameliorate the solidity of company and attract more customers and investors. It is interesting to study the relationship between leverage and financial performance of firm. The organizations does not longer want to borrow funds for financing their belongings must use completely equity financing to finance their property (Magli *et al.*, 2018).

Leverage can describe as when an investor or business entity lends the borrowed money for the extended business. A more leveraged firm is at risk and if it failed to pay the interest on the debt; it will not be able to borrow in the future (Alim *et al.,* 2022). Also Kibuchi (2015) argues that ineffective management of a firm's financial leverage leads to difficulties in meeting its financial commitments when they are due.

Therefore our extended value is to measure the impact of leverage on financial performance of quoted firms in Tunisia. To answer this question we employ the structure of the article in three sections. The first section concerns literature review; the second section is devoted to research study and the third section to conclusion.

2. Literature Review

Financial leverage is not the only determinant of a firm's profit earning potential; it is also a source of risk (Kaupelyte and Mscichauskas, 2016). Financial leverage refers to the extent to which a firm relies on debt. Therefore any firm must make the right decision in terms of its capital structure to forecast capital costs. Although increasing financial leverage might enable a firm to increase its value by profiting form tax shields on debt (Modigliani and Miller, 1963).

Higher financial leverage might lead to higher expected direct and indirect financial distress cost which decrease the firm's value (Ross *et al.,* 2002). Syamsuddin (2009) indicated that leverage is a term used to define a firm's ability to utilize fixed costs assets or funds to maximize the level of income. Financial leverage refers to the use of funds with a fixed burden with the hope that will increase revenus per share (Kamluddin and Indriani, 2012; Liapis and Thalassinos, 2013).

On the other hand a firm's financial performance refers to a firm's ability to generate new resources from day to day operations on a given period (Bora, 2008). It involves enhancing shareholder's wealth and profit making which are among the major objectives of a firm (Pendey, 2005; Grima and Thalassinos, 2020).

The results of measuring the firm performance are needed by 3 groups, shareholders, creditors, and firm's management each of which has a different purpose.

The shareholders need information about the firm's financial performance to prevent the risk of loss in the stock portfolio to assess whether credit will granted base on firm's performance while management takes various decisions by looking at the firm financial performance in the previous period (Vidyaneta *et al.,* 2016).

There are several studies that analyzed the relationship between leverage and financial performance of firms. Simerly and Li (2000) found support for both a positive and negative relationship between leverage and profitability depending on the environmental dynamism. The relationship was positive for firms operating in a low or non dynamic environment whereas they found a negative relationship for firms operating in a more dynamic environment (Thalassinos *et al.,* 2013).

Uloyol *et al.* (2014) studied a sample of firms listed in Istanbul stock exchange. By applying an ARDL model over the period 1991-2012 they found a positive relationship between ROE and leverage for industry firms. This relationship is negative in IT, food and textile industry. Kamran *et al.* (2016) studied a sample of 24 firms listed in Pakistan stock exchange for the period 2010-2015. They found that debt ratio has negative but significant relationship with ROA.

AbuAbbas *et al.* (2019) studied a sample of firms in Amman stock exchange. They found that financial leverage has a negative relationship with the firm performance (ROA; EVA). In addition the relationship between financial leverage and performance is more negative for the firms that use product differentiation strategy compared with the firms that use low cost strategy and for the firms with a high degree of competitiveness compared with the firms with a low degree of competitiveness.

Kishmender *et al.* (2021) studied a sample of shariah listed consumer products and services firms in Malaysia from 2014 to 2018). The results indicate that financial leverage has a negative effect on financial performance. Anh and Phuong (2022) studied 60 listed manufacturing firms in Vietnam to determine the relationship between financial leverage and firm performance. They found that short term long term and total debt have significant impact firm performance. Guhtara *et al.* (2019) studied a sample of 30 companies for the period 2007-2015. They found that leverage has significant positive effect on financial performance of selected companies.

Mastoma (2022) used a sample of top 40 firms listed in Johansburg stock exchange. By applying a method of moments (GMM) for the period 2001-2019) he found that financial leverage has negative influence on profitability. Alim *et al.* (2022) studied 5 companies in Paksitan for the period 2016-2020 and found that company's leverage has significant impact on return on assets. Ravindran and Kengatharan (2021) have studied 82 non financial firms listed in Colombo stock exchange for the period 2013-2017.

Fixed effect model reveals that there is negative significant impact of financial leverage on return on assets of the non financial firms listed in CSE.

Afolabi *et al.* (2019) studied the relationship between leverage and financial performance of Nigerian firms between the years 2007-2016). The random effect generalized least squares method revealed a positive and significant effect between leverage and profitability (Hanias *et al.,* 2020).

Iqbal and Usman (2018) studied 16 companies in Pakistan for the period 2011-2015. Results show that financial leverage has negative and significant effect on ROE and financial leverage but positive effect on ROA. Maina *et al.* (2018) studied a sample of 35 non financial firms in Nairobi stock exchange in Kenya. They found a positive effect of leverage on financial performance of firms.

Alabri *et al.* (2021) studied 32 companies listed in Muscat stock exchange. They found that financial leverage has a positive impact on performance of firms. Bui *et al.* (2021) studied a sample of small and medium enterprises in Vietnam during the period 2008-2016. They found a non linear relationship between debt and firm profitability. This relationship takes the form of non inverted U shape.

Firm profitability only increase to a certain level of leverage and risk (Thalassinos and Thalassinos 2018). When the debt ratio becomes too high firm performance starts to decrease, the results highlight the role of financial distress cost in debt financing for SMEs.

Chen (2020) studied a sample of chinesse listed companies for the period 2010-2018 by using OLS and 2SLS method. This research shows that the relationship between financial leverage and firm performance is positive. Andersson and Mimenma (2019) studied a sample of 130 consulting firms in Sweden during the period 2012-2016. They used several statistical models including OLS, fixed effect models, and robust fixed effects mpdels. The results show that leverage has a significant negative relationship with profitability.

Kaluarachchi *et al.* (2021) studied a sample of manufacturing firms in Sirilanka. They found a positive relationship between leverage and firm performance. Oyinloye *et al.* (2020) studied 18 insurance firms in Nigeria for the period 2008-2017. They found a negative relationship between leverage and financial performance.

Ali *et al.* (2022) studied 70 firms listed in Pakistan stock exchange for the period 2010-2016. They found negative but statistically significant relationship of leverage on firm performance with both ROA and ROE.

It is necessary to underline the importance of previous theories like, agency theory, trade off theory, Pecking order theory.

Agency theory: It proposes that a high level of leverage reduces the agency cost while increasing a firm's performance (Aivuzian *et al.,* 2005; Berger and Batti 2006; Jensen and Meckling, 1976).

Agency cost reduced through higher leverage because of the pressure from generating cash inflow (Jensen, 1986). Leverage can reduce the conflict of interest between managers and shareholders when it is used to make investment decisions (Myers, 1977).

Trade off theory: It assumes that firm tradeoff the benefits and costs of debt and equity financing and more towards an optimal mix of the various sources of finance. The theory suggests that a firm can continue to make use of debt in its capital structure initial an optimum level is reached, where the benefit of using the debt is equal to the cost of using the debt (bankruptcy).

The tradeoff theory indicates that debt initially has a positive relationship with profitability but changes direction after benefits from tax shields and costs of financial distress break even. For low levels of debt there is a positive relationship which eventually shift and become negative at some point as leverage increases.

Pecking order theory: This theory explains that firms follow a financing hierarchy in selecting the combination of sources of capital that are available. This arose as a result of information asymmetry between the firm's inside managers, and the outside shareholders (Myers, 1984). The theory suggests that funds can be obtained form intent and external sources. The firm will first of all employ the internal source (retained earnings) to finance its investment project and if this is not enough then the use of the external source is considered.

However the debt capital (which is considered to be cheaper than equity capital because of its tax shield) is used before equity capital (Chen and Chen, 2012; Luigui and Sori, 2014).

Myers and Majluf (1984) believe that more profitable firms will rely primarily on internal financing leading to a relatively small debt ratio compared to less profitable firms. Ultimately the pecking order theory thus suggests a negative relationship between leverage and profitability.

3. Empirical Study

3.1 Sample

We used a sample of 30 companies listed in Tunisian stock exchange over the period 2016-2021 (Table 1).

Table 1. *List of companies*

	Name of Company
1	Air liquid
2	SIAME
3	Ciment Bizerte
4	Carthage Ciment
5	SOTIPAPIER
6	Essoukna
7	SOMOCER
8	Magasin Générale
9	STIP
10	Sotetel
11	Sotmail
12	SITEX
13	SFBT
14	Tawassol
15	Ennakl
16	Adwya
17	SOTUMAG
18	STAG
19	SAH
20	Assad
21	Office Plast
22	STEG Internationale services
23	CELLCOM
24	SOPAT
25	Sanimed
26	SOTUVER
27	Simpar
28	Poulina
29	Delice
30	SBS

Source: *Own study.*

3.2 Estimation Method

We used a model of panel data because panel data can model both common and individual behavior of groups. Panel data contains more information and viability and more efficiency than pure time series data or cross sectional data (Arimatage – Chan and Jackson, 2015). Panel data can detect and measure statistical effect that pure time series or cross sectional data cannot. Hsiao (2003) defined panel data as a given sample of an individual over time providing multiple observations on each individual in the sample.

3.3 Model Specification

Model 1 :
ROAi,t = b0+ b1 Sizei,t +b2 CAPi,t +b3 CRi,t +b4 Levi,t +b5 Fai,t + b6 ALAi,t b7 CEAi,t +b9 TINFi,t +Ei,t

Model 2 :
ROEi,t = b0+b1 Sizei,t +b2 CAPi,t +b3 CRi,t +b4 Levi,t +b5 FAi,t +b6 ALAi,t +b7 CEAi,t +b8 TPIBi,t +b9 TINFi,t +Ei,t
ROA = net profit / total assets
ROE = net profit / total equity
Size = log of total assets
ALA = liquidity / total assets
FA = Non current liabilities / equity
Lev = total liabilities / total assets
CR = current assets /total liabilities
CEA = operating costs / total assets
TPIB = economic growth
TINF = rate of inflation
B0: constant
B1 , b2 , b3 , b4 , b5 ; b6 ; b7 ; b8 ; b9: Parmeters to be estimated
E: Error term, i= firm t= time

We propose to verify the following hypothesis :
H1: Leverage has a positive impact on ROA.
H2: Leverage has a negative impact on ROA.
H3: Leverage has a positive impact on ROE.
H4: Leverage has a negative impact on ROE.

3.4 Analysis of Desciprtive Statistics

Table 2. *Descriptive statistics*

Variable	Observations	Mean	St. dev	Minimum	Maximum
ROA	180	0.042	0.16	-0.64	0.96
ROE	180	0.071	0.54	-3.004	3.42
ALA	180	0.124	0.521	0.0003	0.678
Size	180	18.44	1.81	11.29	22.24
CAP	180	0.40	0.583	-3.013	3.62
CR	180	2.28	3.25	0.052	32.017
Lev	180	0.85	1.027	0.0021	1.934
FA	180	0.76	2.61	-11.75	14.8
CEA	180	0.37	0.28	0.0119	1.47
TPIB	180	0.003	0.041	-0.087	0.033
TINF	180	0.0571	0.01	0.036	0.0731

Source: *Own study.*

Where:
-ROA (mean = 0.042%). The net result represent 4.2% in average of total assets
The standard deviation is high. There is a big difference between firms in terms of ROA.
-ROE (mean = 0.771). On average net result represent 7.1% of equity. The standard deviation is high. There is a big difference between firms in terms of ROE.
-ALA (mean = 0.124). On average liquid assets represent 12.4% of total assets
Standard deviation is high. There is a big difference between firms in terms of ALA.
-Size (mean = 18.44). There are big firms and small firms in the sample.
-CAP (mean = 0.40). On average capital represent 40% of total assets.
There is a big difference between firms in terms of CAP.
-CR (mean = 2.28). On average current assets represent 2.28 of non current liabilities. The standard deviation is low.
-Lev (mean = 0.85). On average total liabilities represent 85% of total assets. Standard deviation is high.
-FA (mean = 0.76). On average total liabilities represent 76% of total assets. Standard deviation is high.
-CEA (mean = 0.37). The operating costs represent 37% in average of total assets. Standard deviation is low.
-TPIB (mean = 0.0033). The economic growth is low in this period because the negative effects of Tunisian revolution and Covid-19.
-TINF (mean = 0.057). Inflation is high.

3.5 Multicolinearity Test

Table 3a. *Correlation between the variables*

	ROA	**ROE**	**ALA**	**Size**	**CAP**
ROA	**1.000**				
ROE	0.2520	1.000			
ALA	0.035	0.0088	1.000		
Size	0.0251	0.0050	-0.1108	1.000	
CAP	0.1436	0.1092	0.3444	-0.0867	1.000
CR	0.0348	0.0194	-0.0407	0.0985	0.1611
Lev	-0.0121	-0.0542	-0.0314	-0.0048	-0.2251
FA	-0.0291	0.011	-0.0187	0.1537	-0.0672
CEA	0.0344	0.015	0.1081	-0.0118	-0.0598
TPIB	0.0357	0.0699	-0.0150	-0.0149	-0.01783
TINF	0.0126	0.0021	-0.0232	0.0329	-0.099

Source: *Own study.*

Table 3b. *Correlation between the variables*

	CR	Lev	FA	CEA	TPIB	TINF
CR	1.000					
Lev	-0.1725	1.000				
FA	-0.0573	-0.0225	1.000			
CEA	-0.0461	0.0343	-0.0052	1.000		

TPIB	-0.0394	0.0797	0.0744	0.0114	1.000	
TINF	0.0665	-0.0152	-0.0563	-0.0510	0.104	1.000

Source: *Own study.*

Table 4. *Test of VIF*

Variable	**VIF**	**1/VIF**
CEA	1.58	0.63
CAP	1.27	0.78
Lev	1.23	0.80
ALA	1.19	0.92
CR	1.08	0.93
Size	1.07	0.95
TPIB	1.05	0.93
TINF	1.5	0.96
FA	1.4	0.94

Source: *Own study.*

A variance inflation factor is a measure of the amount of multicolinearity in regression analysis. Mutlicolinearity exists when there is a correlation between multiplee independent variables in multiple regression. This can affect the regression results.

Thus, the variance inflation factor can estimate how much the variance of a regression coefficient is inflation a due to multicolinearity.

If VIF = 1 variables are not correlated;
If 1<VIF < 5 variables are moderately correlated;
If VIF >5 variables are highly correlated.

The higher the VIF the higher the possibility that multicolinearity exists, further research is required.

If VIF >10 there is significant multicolinearity that need to be converted.

3.6 Hausman Test

It is useful to determine the choice between fixed effect and random effect models. The fixed effect model assumes that different individuals in the dataset are accomomodated in different intercepts. The random effect model assumes that the error term of each individual accommodates the integrates of different individus in the data. The benefit of using random effect is that will eliminate the issue related to heteroscedasticity (Anh and Phuong, 2022).

In our case PV = 0.065 in model 1 and PV = 0.089 in model 2. We choose random effect for both models.

3.7 Etstimation Results

Table 5. *Estimation results of Model 1*

ROA	Coefficient	T statistic
Size	0.13	-6.26***
CAP	0.063	-2.94***
CR	0.0022	-0.69
Lev	0.017	2.50**
ALA	0.0086	0.40
FA	-0.0037	-0.09
CEA	-0.012	0.20
TPIB	0.112	-2.53***
TINF	0.56	0.69
Constant	2.47	6.32

Source: *Own study.*

Table 6. *Estimation results of Model 2*

ROE	Coefficient	Tstaitsic
Size	0.0046	2.581***
CAP	0.079	2.025*
CR	-0.0035	1.025
Lev	-0.023	0.075
ALA	-0.042	0.085
FA	0.033	2.36***
CEA	-0.163	2.75***
TPIB	0.111	0.015
TINF	0.52	2.35**
Constant	2.54	1.17

Source: *Own study.*

3.8 Interpretations of Model 1

There is a positive relationship between size and ROA (if size increase by 1% ROA increase by 0.13%). The increase of size has a positive effect on return on assets. This relationship is statistically significant at 1%. This result is similar to result found by Odusanya *et al.* (2018) and Kant (2018) but contrary to result found by Ali *et al.* (2022), Lazar 2016) and Margaretha and Supartika (2016).

Thus large firms tend to be more profitable to smaller firms. Large firms have more advantage in negotiating their inputs, reducing their costs. Large benefits form economies of scale and economies of scope. low level of information asymmetry (Dogan, 2013).

The relationship between CAP and ROA is positive; if CAP increase by 1% ROA will increase by 0.063%. The increase of capital has a positive effect on ROA. This

relationship is statistically significant at 1%. The solidity of capital has a positive impact on profit of firm.

The relationship between CR and ROA is positive (if CR increase by 1% ROA will increase by 0.0022%). This relationship is not statistically significant. This result is similar to result found by Pervan *et al.* (2019), Kant (2018), Tailab (2014) but contrary to result found by Ravidnran and Kengatharan (2021). The firm with high current ratio tend to be more profitable.

The relationship between ROA and leverage is positive (if leverage increase by 1% ROA will increase by 0.017%). The increase of leverage has a positive effect on return on assets. This relationship is statistically significant at 5%. This result is similar to result found by Bui and al (2021). This result is contrary to result found by Kalurachci *et al.* (2021), Chen (2020), Mastoma (2022), and Ravindran and Kengartharn (2021). The leverage is a measurement which shows how much the firm assets are financed by debts.

There is positive relationship between ALA and ROA (if ALA increase by 1% ROA will increase by 0.0086%). The increase of liquidity has a positive effect on return on assets. The liquidity of firm can increase the new investment and create more profits.

There is a negative relationship between FA and ROA (if FA increase by 1% ROA decrease by 0.0037%). The increase of non current liabilities / equity has a negative effect on return on assets. The non current liabilities increase the debt of firm that will decrease the net profit of firm.

There is a negative relationship between CEA and ROA (if CEA increase by 1% ROA will decrease by 0.012%). The increase of operating costs has a negative impact on ROA. The increase of operating costs will enhance the costs of firms. That has influenced negatively the net profit of firms.

There is a positive relationship between TPIB and ROA (if TPIB increase by 1% ROA will increase by 0.112%). This relationship is statistically significant at 5%. The increase of economic growth has a positive effect on ROA. This result is similar to result found by Bui *et al.* (2021).

During periods of economic growth demand for the firm's good and services is potentially increasing and consequently is expected that firms will increase its sales and achieve higher profitability (Pervan *et al.*, 2021).

There is a positive relationship between ROA and TINF (if TINF increase by 1% ROA will increase by 0.56%). The increase of inflation has a positive effect on ROA. This relationship is not statistically significant. According to Perry (1992) the effect of inflation depends on whether inflation is anticipated or non anticipated.

In the case of anticipated inflation firms are able to timely adjust the prices of goods at a level which ensures high revenues and the adequate cost of management measures ensuring at operating costs do not exceed revenues.

3.9 Interpretations of Model 2

There is a positive relationship between ROE and Size (if Size increase by 1% ROE will increase by 0.0046%). The increase of size has a positive effect on return on equity. This relationship is statically significant. This result is similar to result found by Bui *et al.* (2021). This result is contrary to result found by Nguyen and Nguyen (2020). The large firms have more opportunities to invest and select the good employees and directors. That has increased their profits.

There is a positive relationship between ROE and CAP (if CAP increase by 1% ROE will increase by 0.079%). The increase of capital has a positive effect on return on equity. The increase of capital enhance the financial solidity of firm and its capacity to make new investments. This increase the net profit of firms.

There is a negative relationship between ROE and CR (if CR increase by 1% ROE will decrease by 0.0035%). The increase of current assets / current liabilities has a negative effect on ROE. The increase of current assets has a positive effect on profit of firms.

There is a negative relationship between ROE and leverage (if Lev increase by 1% ROE will decrease by 0.023%). The increase of leverage has a negative impact on return on equity, this result is similar to result found by Nguyen and Nguyen (2020), Ali *et al.* (2022), Anh and Phuong (2022). But contrary to result found by Kaluarachichi *et al.* (2021), Kamaran *et al.* (2021), and Bui *et al.* (2021).

Although debt financing is deemed to be cheaper than equity financing it doesn't always mean more debt leads to higher performance (Chen, 2020). There are 2 mainly reasons:

Firstly debt can bring financial risks to the operation process (Hamada *et al.,* 1972). These financial risks may increase the agency problems in the firms.

Secondly debt can introduce agency costs to a firm (Jensen and Meckling, 1976).

There is a negative relationship between ROE and ALA (if ALA increase by 1% ROE will decrease by 0.042%). The increase of liquidity has a negative impact on return on equity. The accumulation of liquidity can make the firm don't motivate for new investments. This decrease the net profit of firm.

There is a positive relationship between FA and ROE (if FA increase by 1% ROE will increase by 0.033%). The increase of non current liabilities / equity has a

positive impact on return on equity. The non current liabilities increase the debt of firm and his possibility to make new investments. This can ameliorate his net result.

There is a negative relationship between CEA and ROE (if CEA increase by 1% ROE will decrease by 0.163%). The increase of operating costs has negative impact on return on equity. The increase of operating costs enhance the costs of firms and therefore decrease their net result.

There is a positive relationship between TPIB and ROE (if TPIB increase by 1% ROE will increase by 0.111%). The increase of economic growth has a positive impact on return on equity. The economic growth ameliorate the economic conditions in the country. This is encourage the firm to make new investments. This is ameliorate the profit of firm.

There is a positive relationship between TINF and ROE (if TINF increase by 1% ROE will increase by 0.52%). The increase of inflation has a positive effect on return on equity. The increase of inflation enhance the motivation for work and product and services. This might ameliorate the net result of firm.

4. Conclusion

The financial leverage is essential for the firm to meet his obligations and create more investment. Also financial performance is primordial to enhance the growth of firm and satisfy the needs of the shareholders and creditors. It is interesting to study the relationship between financial leverage and financial performance.

The previous theories like agency theory, tradeoff theory, pecking order theory found mixed results about this relationship. Financial leverage increases as the fixed financial expenses of a firm increases. Interest expenses increase with a higher amount of debt been incurred. Therefore as the level of debt relative to equity increases a small percentage change in earnings before interest and tax will led to a percentage change in net income (Oyinloye *et al.*, 2020).

In this article we studied a sample of 30 firms listed in Tunisian stock exchange for the period 2016-2021. By applying 2 models of panel data methodology we found that leverage has a positive impact on return on assets (ROA) but leverage has a negative impact on return on equity (ROE).

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