THE DETERMINANTS OF FIRM PROFITABILITY IN TUNISIAN STOCK EXCHANGE

Mohamed Aymen Ben Moussa, University of Tunis El Manar
Adel Boubaker, University of Tunis El Manar

ABSTRACT

Profitability is a measure of an organization's profit relative to its expenses. Organizations that are more efficient will realize more profit as a percentage of its expenses than a less-efficient organization, which must spend more to generate the same profit. It is important to identify the factors influencing profitability of firm. The aim of this research is to indicate the determinants of firm profitability. We used a model of panel static in a sample of 30 firms listed in Tunisian stock exchange for the period (2016-2021).

The results of this study show that capital; size; liquidity and economic growth have a positive effect on firm profitability. But inflation and financial autonomy has negative effect on firm profitability.

Keywords: Panel, Profitability, Firm, Tunisian Stock Exchange.

INTRODUCTION

Profitability is a core of the performance of a firm and it constitutes essential aspects of its financial reporting (Odusanya et al., 2018).

Profitability can be described as a measurement of how well a firm uses its assets from its primary mode of business to generate income. The term is also used a general measure of a firm's overall financial health over a given period of time. Certain firm characteristics have been associated with firm profitability such as firm age; firms size (Malik, 2011); liquidity (Dogan, 2013) and leverage. The profitability of firms could be affected by both internal and external firm's characteristics.

In this article, our purpose is to indicate the different theories linked to the firm profitability. Also we attempt to identify the impact of internal and external factors on firm profitability in Tunisian listed firms.

We used a methodology of 3 sections. The first section is devoted to literature review. Then we make an empirical study. We Finished by conclusion.

LITERATURE REVIEW

Profitability reveals the firm's ability and capacity to generate earnings at a rate of sales; level of asset and stock of capital in a specific period of time (Margaretha & Supartika, 2016). Profitability refers to the capacity of the company to produce income as a return on its invested money hence it represents the success or failure of the organization (Durrah et al., 2016).

There are many theories linked to factors affecting the profitability of firm (market based view; the resources based view; the strategy conducting performance; the structure conduct performance; the pecking order theory).

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In market based view many authors believe that the competitive advantage for firms are granted mostly by the industrial organization economies; taking benefits for external market to achieve higher return which are measured by the profitability and the firm values (Gilbert, 1989; Molloy & Barney, 2015; Zheng et al., 2019). In contrast; in resources based view it can be said that the profitability is provided as a result of different resources such as human resources, machines and technology (Petraf, 1993; Wernerfelt, 1995; Bromiley & Rau, 2016).

Researches with strategy conducting performance think that a firm strategy, created in consideration of external environment factors; drives the development of organizational structure and processes; then helps the firms with better performance than competitors who lack the same degree of strategies (Galbraith & Nathasm, 1978).

The pecking order theory states that companies prioritize their sources of financing (from internal financing to equity) and consider equity financing as a last resort. Internal funds are used first, and when they are depleted, debt is issued. When it is not prudent to issue more debt, equity is issued. This theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required.

As noted by Berger and Udell, the hierarchy depends on the firm's size and level of development because there is a particular level of information asymmetry and financial need for every phase of growth. This is also known as the "*financial growth cycle*".

During this cycle, venture capitalists and private equity operators may improve the efficiency of the entire financial system, because they tend to work with informationally opaque firms. For this reason, they represent the proper solutions for startup because of the lack of information, the uncertainty of future results, and the organizational structure that is likely to develop. At the same time, firms that want to make strategic decisions linked to the governance or to the status of corporate finance decisions may find that the private equity industry is right for them (Nobanee, 2020).

According to this theory, private equity operators and venture capitalists revolutionized the pecking order system because equity finance comes before debt financing in some cases. This occurs because of the need for more transparency and the reduction of information asymmetry among traditional financiers, such as banks and firms where the need for financial sources is just a part of the whole problem to be solved (Reece et al., 2020).

The pecking order theory explains the role of the private equity industry and, more important, highlights the reasons why it operates regardless of the level of development or size of a company. Different from traditional financiers that usually support firms only with money, the private equity industry brings management capabilities to the firms and information to the whole financial system. These elements set this industry apart from credit or banking institutions.

There are several articles studied the factors affecting profitability of firm.

Goddard et al. (2005) use panel data analysis to examine the determinants of a firm's profitability for a group of European countries over the period (1993-2001). The results show that profitability is statistically negatively affected by a firm's size and gearing ratio; while positive affected by market share and liquidity.

Asimakopoulos (2009) investigate the impact of both firm specific factors and macro-environment on firm profitability in the context of Greece from (1995-2003) by using panel data analysis for a sample of 3094 non-financial companies. The results show a positive impact of both financial leverage and current ratios while an inverse relationship between the variables; such as firm's size; sales growth; investment and firm's profitability.

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Stiwarld (2010) investigated the determinants of firm's profitability for a sample of large Australian firms from (1995-2005). Findings show that company profitability is primarily influenced by level firm's characteristics; in the sector effect playing a minor role; and contomperous productivity; lagged productivity; leverage and size affected firm's profitability.

Yazdanfar (2013) was used a sample of 12530 non-financial swedich firms through the period (2006-207) to examine the determinants of a firm's profitability. The results show that a firm's profitability is positively affected by growth; lagged profitability; and productivity while negatively affected by industry affiliation and firm's variables.

Pervan et al. (2019) studied a sample of 9359 firms operating in the Croatian manufacturing industry during (2006-2015). They found that the firm age; labour cost and industry concentration; GDP growth and inflation have significant influence on firm profitability.

Nguyen & Nguyen (2021) investigated the determinant of firm profitability of 1343 vitenames companies categorized into 6 different industries listed on Vietnamese stock exchange over a period for (2014-2017). They found the main determinants are (firm size; liquidity; solvency).

Also Odusanya et al. (2018) examined the determinants of firm profitability for 114 firms listed on the Nigerian stock exchange from (1998-2012) using the generalized method of moment (GMM). The results show that lagged profitability exerts significant positive effect on contemperaonous firm profitability. However; short term leverage; inflation rate; interest rate and financial risk have significant negative effect on firm profitability.

Kant (2018) assessed the factors influencing profitability of manufacturing firms listed on the NewYork stock exchange. He used a sample of 250 American manufacturing firms for years (2012-2017). The results indicate a positive relationship between investment in research and development; growth rate; employee productivity; leverage ratio; current ratio and the dependent variable. No significant statistically relationship was found for firm size; age with profitability.

The results also suggest a negative relationship between net assets turnover and profitability. Besides Dahmash et al. (2021) used a sample of firms listed in Jordan for the period (2011-2018).

They found a significant positive effect of a firm size and asset growth on profitability. However; asset tangibility presents a significant positive effect on profitability.

Isik & Tasgin (2017) analyzed the factors that determine the profitability of 120 manufacturing firms listed in Borsa Istanbul listed Exchange during the period (2005-2012). The results indicated that lagged profitability; firm size; financial risk; research and development costs; net working capital; and economic growth are most important variables affecting firm profitability.

Cheong & Haong (2021) studied the impact of macroeconomic variables and firm specific on corporate profitability in Singapore and Hong Kong before; during and after the global financial crisis.

This paper uses the 2 step system generalized method of moments. The results indicate that past profitability; firm size and leverage have a strong relationship with firm performance.

Also Charles et al. (2018) used a sample for listed consumer good companies in Nigeria over the period (2011-2016). They found that firm size; sales growth and leverage have significant effect on profitability. In contrast; firm age and liquidity are not significantly affecting profitability.

Al Homaidi et al. (2021) studied a sample of 1308 listed firms operating in Bombay stock exchange in India for the period (2011-2018). The results of the study show that leverage;

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company efficiency and findings have a strong relationship with profitability measured by ROE. The results also reveal that company efficiency and firm size have a positive association with firm profitability measured by ROE and EPS (earning per share).

Susilo et al. (2020) studied a sample of 350 manufacturing firms listed on the Indonesia Stock exchange over the period (2010-2017). The results of the study indicate that working capital; firm size and firm growth were positively related to profitability. Meanwhile capital structure and non-debt tax shiled did not affect profitability. Ghashemi studied a sample of 60 listed companies in Malaysia over the period (2009-2013). The findings of the static panel model revelad that liquidity and size have positive effect on ROA; while the effect of growth and debt were negatively significant. Also firm size and sales growth had significant effect on ROE.

The findings obtained from the system generalized method of moment (GMM) indicated that sales growth and leverage had negative and significant effect on ROA and ROE. While firm size was significantly and positively related to profitability. The lagged leverage had an insignificant relationship with profitability. However; liquidity had a significant negative influence on ROA but the effect of liquidity on ROE was insignificant.

Ekadja studied a sample of 44 firms listed in Indonesia stock exchange over the period (2017-2019). They found that no significant influence between liquidity and firm age toward firm performance. There are positive significant influence between growth and firm size towards firm performance. There is negative significant relationship between leverage and firm performance.

Also Chawla & Mnari (2019) studied a sample of 35 manufacturing firms listed in India for the period (2011-2012) to (2016-2018). The results of the study revealed that capital structure and firm size affected the financial performance negatively; the liquidity and working capital affected the financial performance positively.

Dodoo et al. (2020) studied 15 companies listed in Ghana Stock exchange over the period (2008-2017). The analysis is based on 2 methods of estimations; two step system generalized method of moments (GMM) and ordinary least square (OLS method). The result indicated that analysis revealed that firm size; Growth; and cash-flow ratio; significantly and positively determine firm performance whereas (debt to equity) influence negatively the firm performance.

Empirical Study

The determinants of firm profitability has been the object of several researches. Under this section; we will identify the sample at the beginning and then we specify the variables and the model. After we carry out the necessary econometric tests: Finally we show the estimation results of the model and their interpretations Table 1.

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

Table 1
SAMPLE OF 30 COMPANIES

	Name of company
1	Air liquid
2	SIAME
3	Ciment Bizerte
4	Carthage ciment
5	SOTIPAPIER
6	Essoukna

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7	SOMOCER
8	Magasin General
9	STIP
10	SOTETEL
11	SOTEMAIL
12	SITEX
13	SFBT
14	Tawassol
15	Ennakl
16	Adwya
17	SOTUMAG
18	STAG
19	SAH
20	Assad
21	Office plast
22	STEG international services
23	CELLCOM
24	SOPAT
25	SANIMED
26	SOTUVER
27	SIMPAR
28	Poulina
29	Delice
30	SFBT

B-Estimation Method

We used a model of panel static because: Panel data can model both the common and individual behaviors of groups.

Panel data contains more information, more variability, and more efficiency than pure time series data or cross-sectional data (Armitage-Chan & Jackson, 2018).

Panel data can detect and measure statistical effects that pure time series or cross-sectional data can't.

Panel data can minimize estimation biases that may arise from aggregating groups into a single time series Table 2 & Table 3.

C-Model Specification

Model 1

ROAi,t= b0+b1Sizei,t +b2 CAPi,t +b3 CRi,t +b4 Levi,t +b5 FAi,t +b6ALAi,t +b7 CEAi,t +b8 PEi,t +b9 TPIBt +b10 TINFt +Ei,t

i=firm t=time, b0=constant; b1……b10: parameters to be estimated

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 PEi,t +b9 TPIBt +b10 INFt +Ei,t

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Table 2 D-VARIABLES SPECIFICATION	
Variable	**Measure**
ROA	Net profit/Total assets
ROE	Net profit/Total equity
Size	Logartihm of total assets
CAP	Equity/Total assets
ALA	Liquidity/Total assets
FA	Non currents liabilties/Equity
Lev	Total labilités/Total assets
CR	Current assets/Current liabilites
CEA	Operating costs/Total assets
PE	Operating revenus/Total assets
TPIB	Economic growth
TINF	Rate of inflation

We proposed to verify these hypotheses:

H_1: *Size has a significant effect on firm profitability*

H_2: *Capital has a significant effect on firm profitability*

H_3: *Current ratio has a significant effect on firm profitability*

H_4: *Leverage has a significant effect on firm profitability*

H_5: *Financial autonomy has a significant effect on firm profitability*

H_6: *Operating costs has a negative effect on firm profitability*

H_7: *Operating revenues has a positive effect on firm profitability*

H_8: *Economic growth has a positive effect on firm profitability*

H_9: *Inflation has a negative effect on firm profitability*

E-Descriptive Statistics

Table 3 SUMMARY OF DESCRIPTIVE STATISTICS					
Variable	**Observations**	**Mean**	**Standard deviation**	**Minimum**	**Maximum**
ROA	180	0.042	0.16	-0.64	0.9694
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	22.024
CAP	180	0.40	0.583	-3.013	3.62
CR	180	2.28	3.52	0.052	32.017
Lev	180	0.85	1.027	0.0021	9.34
FA	180	0.76	2.61	-11.75	14.8
CEA	180	0.37	0.28	0.0019	1.47
PE	180	0.35	0.28	0.00055	0.95
TPIB	180	0.003	0.041	-0.087	0.033
TINF	180	0.0571	0.011	0.036	0.0731

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1. ROA (mean=0.042). In average net result represent 4.2% of total assets. The standard deviation is high. There is a big difference between firms in term of ROA.
2. ROE (mean=0.071). In average net result represent 7.1% of equity. The standard deviation is high. There is a big difference between firms in term of ROE.
3. ALA (mean=0.124). In average liquid assets represent 12.4% of total assets. Standard deviation is high. There is a big difference between firms in term of ALA.
4. Size (mean=18.44). There are a big firms and small firms in this sample.
5. Cap (mean=0.40). In average the CAP represent 40% of total assets. There is a big difference between firms in term of CAP.
6. CR (mean=2.28). In average current assets represent 2.28 of current liabilities. The standard deviation is low.
7. Lev (mean=0.85). In average total liabilities represent 85% of total assets. Standard deviation is high. There is big difference between firms in term of lev Table 4 & Table 5.

F-Multiciolinearity Test

Table 4
CORRELATION BETWEEN VARIABLES

	ROA	ROE	ALA	Size	CAP
ROA	1.000				
ROE	0.2520	1.000			
ALA	0.0350	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	0.11	-0.0187	0.1537	-0.0672
CEA	0.0344	0.015	0.1081	-0.0118	-0.0598
PE	-0.0062	0.0332	0.1371	0.0612	-0.0246
TPIB	0.0357	0.0699	-0.0150	-0.0149	-0.0783
TINF	0.0116	0.0021	-0.0232	0.0329	-0.099

Table 5
SUITE OF CORRELATION BETWEEN VARIABLE

	CR	Lev	FA	CEA	PE	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			
PE	-0.0872	0.2918	0.0031	0.5745	1.000		
TPIB	-0.0394	0.0797	0.0744	0.0114	-0.0844	1.000	
TINF	0.0665	-0.0152	-0.0583	-0.0510	-0.0426	0.1048	1.000

The all coefficients are inferior to 80% there is no problem of multicollinearity Table 6.

Table 6
Test of VIF

Variable	VIF	1/ VIF
PE	1.76	0.56
CEA	1.58	0.63
CAP	1.27	0.78

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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	

A variance inflation factor (VIF) is a measure of the amount of multicollinearity in regression analysis. Multicollinearity exists when there is a correlation between multiple independent variables in a multiple regression model. This can adversely affect the regression results. Thus, the variance inflation factor can estimate how much the variance of a regression coefficient is inflated due to multicollinearity.

In general terms:

1. VIF equal to 1=variables are not correlated
2. VIF between 1 and 5=variables are moderately correlated
3. VIF greater than 5=variables are highly correlated

The higher the VIF, the higher the possibility that multi-collinearity exists, and further research is required. When VIF is higher than 10, there is significant multi-collinearity that needs to be corrected.

Estimation Results

Table 7
ESTIMATION RESULTS OF MODEL 1

ROA	Coefficient	Tstatistic	Coefficient	T statistic
Size	0.13	-6.26(***)	0.0086	-0.90
CAP	0.063	-2.94(***)	0.0031	0.14
CR	0.0022	-0.69	0.00077	-0.22
Lev	0.017	2.50(**)	0.017	2.38
ALA	0.0086	0.40	0.015	0.66
FA	-0.00037	-0.09	-0.0032	-0.71
CEA	-0.012	0.20	-0.044	0.075
PE	0.085	-2.68(***)	0.057	-2.04
TPIB	0.12	-2.53(**)	0.076	2.29
TINF	0.56	0.69	0.20	0.21
Constant	2.47	6.32	0.18	0.98

Pv value=0.28 (Test of Hausman)

Therefore we choose random effect Table 7,

Interpretations of estimation Model 1

1. There is a positive relationship between ROA and Size (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%.
2. This result is similar to result found by (Odusanya et al., 2018); Kant, 2018; but contrary to result found by (Lazar, 2016; Margaretha & Supritha, 2016).

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3. Thus large firms tend to be more profitable than smaller firms. The large firms have more advantage in negotiating their inputs; reducing their costs.
4. Large benefits from economies of scale and economies of scope; low level of information asymmetries (Dogan, 2013).
5. Also the relationship between CAP and ROA is positive (if CAP increase by 1% ROA increase by 0.063%) . The increase of capital has a positive effect on ROA
6. This relationship is statistically significant at 1%
7. The relationship between CR and ROA is positive (if CR increase by 1%) ROA increase by 0.0022%. The relationship is not statically significant. This result is similar to result found by (Pervan et al., 2019; Kant, 2018; Tailab, 2014). Which suggested that firms with a greater current ratio tend to be more profitable.
8. The relationship between ROA and Lev is positive (if Lev increase by 1% ROA increase by 0.017%). The increase of leverage has a positive effect on return on assets. This relationship is statistically significant at 5%.
9. There is positive relationship between ALA and ROA (if ALA increase by 1%; ROA increase by 0.0086%). The increase of liquidity has a positive effect on return on assets. This relationship is not statically significant.
10. There is negative relationship between FA and ROA (if FA increases by 1%, ROA decrease by 0.00037%). The increase of (noncurrent liabilities /equity) has a negative effect on return on assets.
11. Also there is negative relationship between CEA and ROA (if CEA increase by 1%; ROA decrease by 0.012%). The increase of operating costs has a negative impact on return on assets. This relationship is not statically significant.
12. There is a positive relationship between ROA and PE (if PE increase by 1%; ROA increase by 0.085%). The increase of operating revenues has a positive effect on return on assets.
13. There is a positive relationship between TPIB and ROA (if TPIB increase by 1%, ROA will increase by 0.12%). This relationship is statistically significant at 5%
14. The increase of economic growth has a positive effect on return on assets.
15. During periods of economic growth demand for the firm's goods and services is potentially increasing and consequently it is expected that the firm will increase its sales and achieve higher profitability (Pervan et al., 2021).
16. This result is similar to result found by (Pervan et al., 2019; Isik & Duski, 2017; Matar et al., 2018). The improvements of economic conditions enhances the firm profitability.
17. There is a positive relationship between ROA and Inf (if TINF increase by 1% ; ROA will increase by 0.56%) . The increase of inflation has positive effect on return on assets. This relationship is not statically significant. According to Perry the effect of inflation on profitability depends on whether inflation is anticipated or unanticipated. In the case of anticipated inflation; firms are able to timely adjust the prices of goods at a level which ensure higher revenues and the adequate cost management measures; ensuring that operating costs do not exceed revenues.

Interpretations of estimation (Model 2)

1. 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.
2. This relationship is statistically significant. This result is contrary to result found by (Nguyen & Nguyen, 2020).
3. There is a positive relationship between ROE and CAP (if CAP increase by 1%; ROE will increase by 0.079%). This relationship is statistically significant at 10%. The increase of capital has a positive effect on return on equity.
4. 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. This relationship is not statically significant.
5. There is a negative relationship between ROE and Lev (if Lev increase by 1%; ROE decrease by 0.023%). The increase of leverage has a negative impact on ROE. This result is similar to result found by (Nguyen & Nugyen, 2020).
6. There is a negative relationship between ROE and ALA (if ALA increases by 1% ROE decrease by 0.042%). The increase of liquidity has a negative impact on ROE

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7. There is a positive relationship between FA and ROE (if FA increase by 1%; ROE increase by 0.033%). The increase of (non-current liabilities/equity) has a positive impact on return on equity. Between CEA and ROE (if CEA increase by 1% ROE will decrease by 0.163%). The increase of operating costs has a negative impact on return on equity. This relationship is statistically significant at 1%
8. There is a positive relationship between PE and ROE (if PE increase by 1% ROE will increase by 0.111%). The increase of operating revenues has a positive impact on return on equity.
9. There is a positive relationship between TPIB and ROE (if TPIB increase by 1% ROE will increase by 0.93%). The increase of economic growth has a positive effect on return on equity.
10. There is positive relationship between TINF and ROE (if TINF increase by 1% ROE will increase by 0.52%). The increase of inflation has a positive impact on ROE.

CONCLUSION

The profitability of firm indicates his capacity to earn money; manage her costs and increase the revenues. It is interesting to evaluate the determinants of firm profitability. We use a sample of 30 firms quoted in Tunisia stock exchange for the period (2016-2021). We employ a model of panel static for two measures of profitability (ROA and ROE).

We found that only (size; capital; leverage; operating revenues; economic growth) has a significant impact on ROA. (Size; CAP; leverage; CEA; Noncurrent liabilities/equity; economic growth) has a significant impact on ROE.

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