International Journal of Economics and Finance; Vol. 15, No. 12; 2023
ISSN 1916-971X E-ISSN 1916-9728
Published by Canadian Center of Science and Education

Capital Structure and Macroeconomic Determinants in Emerging Country: A Panel Quantile Regression Approach

Ibtissem Missaoui[1] & Yaqoub Alduraywish[2]

[1] ISG Sousse, Tunisia, Laboratory of LAMIDED (University of Sousse), Tunisia

[2] Collage of Administrative Sciences, Najran University, Najran, Saudi Arabia

Correspondence: Dr. Yaqoub Alduraywish, Chairman of Accounting Department, Najran University, Najran, Saudi Arabia. E-mail: Ynalduraywish@nu.edu.sa

Received: October 5, 2023 Accepted: November 6, 2023 Online Published: November 10, 2023

doi:10.5539/ijef.v15n12p68 URL: https://doi.org/10.5539/ijef.v15n12p68

Abstract

Financing decisions of firms have been a topic interest for financial economists for a long time. In this study, we aim to contribute to this area by examining the impact of macroeconomic determinants on capital structure in emerging markets. Utilizing the panel quantile regression method (QREG) and analyzing data from listed Tunisian firms between 2011 and 2021, this paper investigates the relationship between macroeconomic determinants and capital structure across different quantiles. The research findings suggest that both firm size and growth options are positively correlated with leverage. Additionally, this paper finds that return on assets has a negative and significant effect at 1% in the first to third quantiles on leverage. The results of this paper have important implications since they can interest firm executives, policymakers, and investors operating in emerging markets.

Keywords: capital structure, leverage, macroeconomics factors, quantile regression method

1. Introduction

Capital structure refers to a company's financing mix of debt and equity used to fund its operations and investments (Llobet-Dalmases, Plana-Erta, & Uribe, 2023). The combination of debt and equity in the capital structure of a company can significantly impact its financial performance and stability. In emerging countries, capital structure receives growing attention as these economies are characterized by unique institutional features and economic policies that can have a significant impact on the financing choices of firms (Missaoui & Bouchaddekh, 2015; Singh & Kannadhasan, 2020).

All decisions making process associated with the capital structure can be influence by a company's financing choice in two ways. Firstly, each firm that has affiliated to the same risk class would have a higher cost of capital. The capital structure can affect the business valuation. Secondly, companies that have more debt being riskier valued less than companies with less debt. For this reason, the capital structure is very important decision as it could lead to an optimal financing mix that can maximize the firm market price (Ahuja & Kalra 2020)**.** There are numerous capital structure theories that aim to explain the company's behavior allowing to a finance choice of a company. The origin of capital structure creates with the works of Modiglian and Miller (1958). These authors expose that in a perfect financial market, under certain hypothesis such as absence of transactions costs and market imperfections, the business value is independent of its choice of financing.

The capital structure of a company is irrelevant in an efficient stock market, as explained by Modiglian and Miller (1958). The theoretical framework takes into account the imperfections of financial markets and shows that the capital structure of firms emerges from both macroeconomic environmental factors and firm-specific factors. Modigliani and Miller (1963) add the tax rate effect to their theory, which encouraged firms to include more of using more debt in the capital structure in order to maximize firm value. Miller (1977) advanced the theory of capital structure by adding three types of tax rates which are the corporate tax rate, the tax rate to be applied on dividends, and the tax rate to be imposed on interest income. Also, Miller (1977) confirms that the value of companies depends on the proportional level of each tax rate illustrious.

Beyond the tax benefits of debt, factors such as agency costs and information asymmetries can influence a company's decision on its debt-to-equity ratio, as detailed by Jensen and Meckling (1976), Myers and Majluf

(1984), Harris and Raviv (1991). Numerous empirical studies confirm the importance of these cost factors in shaping a company's financial structure. Research by Titman and Wessels (1988) as well as Rajan and Zingales (1995) highlight that element representing costs due to information disparities—like the size, profitability, tangible assets, and growth potential of a company are closely tied to capital structure in the U.S. and other developed countries. Besides, Gounopoulos et al. (2013) study the relationship between the capital structure of companies in different and several macroeconomic determinants such as gross domestic product (GDP), inflation, stock market development, the interest rate, etc. The fundamental objective for a business is to reduce its cost of financing. This requires an optimal mix of funding sources, especially debt and equity. Such a combination depends on many microeconomic and country-specific factors. The macroeconomic factors play a crucial role in determining the capital structure of firms in emerging countries (Delcoure, 2007; Missaoui & Bouchaddekh, 2015; Missaoui, Brahmi, & Ben, 2018; Bhat, Chanda, & Bhat, 2020; El-Diftar, 2020; Touil & Mamoghli, 2020; Bui, Nguyen, & Pham 2023).

This study aims to examine the impact of macroeconomic factors on the capital structure of Tunisian listed firms using a quantile regression approach. This approach considers how different quantiles of the data are affected by the independent variables, allowing us to identify the impact of macroeconomic factors on firms' capital structure at different levels. Inaddation, the paper aims to provide evidence on how macroeconomic factors such as inflation, GDP growth, and interest rates interact with the firm-level factors in determining the capital structure of firms in emerging countries such as Tunisia. The findings could enhance our understanding of the role of macroeconomic variables in determining the capital structure decisions of firms and provide useful insights for policymakers, investors, and corporate managers operating in emerging countries. The literature studying the first category is very developed, but the macroeconomic approach is still scarce and little used (El-Diftar, 2020). This subject is very interesting to study because Tunisia has a monetary and fiscal policy can influence capital structure such as GDP growth, interest rate, inflation, corporate tax rate and exchange rates. Previous research on this topic is almost non-existent for the Tunisian market, suggesting the need for further research.

The objective of this study is to investigate how the capital structure of firms listed in the stock market exchange is influenced by the macroeconomic environment. Moreover, this study focuses on an empirical analysis of the capital structure by implementing a quantile regression approach to investigate the behavior of microeconomic characteristics and macroeconomic variables throughout all quantiles of leverage distribution. The outcomes of this research could help firms in creating a more efficient financing policy, as well as offer insights into competitor responses to macroeconomic environment fluctuations.

The outline of the paper is as follows. In Section 2, we review existing literature. In section 3, we analyzed the empirical studies. In Section 4, we present the determinants of capital structure decision. We then discuss empirical findings in Section 5 and conclude the study in Section 6.

2. Literature Review: Theoretical Background

Capital structure refers to the combination of debt and equity used by a company to finance its operations. The choice of capital structure can have important implications for the financial performance and well-being of the firm. In emerging countries, companies face distinctive challenges related to macroeconomic conditions, political instability, and underdeveloped financial systems (Titman & Wessels, 1988; Belkhir, Maghyereh, & Awartani, 2016; Missaoui, Brahmi, & Ben, 2018; Bhat, Chanda, & Bhat, 2020; Touil & Mamoghli, 2020). Therefore, analyzing the determinants of capital structure in these countries can provide important insights into the behavior of firms and their interaction with the broader economy. The inclusion of macroeconomic factors in this analysis can also provide a more comprehensive understanding of the relationship between capital structure and economic conditions (Ahuja & Kalra, 2020). Macroeconomic variables such as inflation, interest rates, and GDP growth can affect the cost of financing and the availability of credit, which may impact the debt-equity mix that firms adopt.

The determinants of leverage at the firm level are well addressed by the three main theoretical frameworks, specifically tradeoff theory, arbitrage theory and hierarchical order theory. These three approaches present some predictions of microeconomic and macroeconomic factors influencing the level debt of firm. The arbitrage theory show that the choice of capital structure is determined by a trade-off between the benefits and cost of debt (Kraus & Litzenberg, 1973). The traditional reasoning supporting this arbitrage is derived from the expenses related to bankruptcy, advantages of taxation, and agency costs linked to asset substitution (Myers & Majluf, 1984) and excessive investment (Jensen & Meckling, 1976). Each company has a target value-maximizing leverage ratio that it strives to achieve (Elkhaldi & Daadaa, 2015).

The debt financing is related with default risk and drives a company to be bankrupt due to the lack of evaluating the two indicators of costs and benefits in order to determine a good capital structure.

According to the pecking order theory, financial sources are classified based on information asymmetry, as noted by (Chakraborty, 2010). As such, companies rely mainly on their internal funds and prefer loans over equity when external financing is required, as stated by (Gounopoulos et al., 2013). Based on the pecking order theory, companies tend to favor external financing, especially in the form of debt (Chakraborty, 2010). This theory also suggests that firms with higher growth opportunities have a greater need for capital and are more likely to rely on external funding in the form of debt conditions (Hayat et al., 2010).

As opposed to Modiglian and Miller (1958) perfect market hypothesis, other theories propose that numerous factors, both internal and external, can influence a firm's leverage. Over time, executives have linked monetary policy decisions to their own financial strategies and decisions, rendering the effect of monetary policy on a company's financial decisions a widely accepted concept. In the past decade, monetary policy has shifted towards addressing inflationary pressures and managing production, rather than addressing poor fiscal policy, as outlined by Anzuini, Lombardi, and Pagano (2010).

The objective of stabilizing prices and combatting inflation is shared by economists and policymakers alike. Classic theory remains relevant today, as reducing the real interest rate through an expansionary monetary policy can encourage investment, reduce the cost of capital, and promote production (Keynes, 1937). Karpavičius and Yu (2017) noted that the interest rate has a considerable impact on capital costs. To describe the results of this investigation into whether profitable companies rely more on debt or equity financing, trade-off theory and pecking order theory will serve as the theoretical approaches.

3. Determinants of Capital Structure Decision

The capital structure determinants area has been extensively studied by numerous researchers. Nevertheless, empirical studies so far have not been able to conclude which determinants are the most important. A review of the literature suggests that these determinants can be broadly categorized into two groups: firm-specific and macroeconomic factors.

3.1 Firm-Specific Determinants of Capital Structure

Numerous studies explore the determinants of capital structure related to firms. Titman and Wessels (1988) discovere that a firm's uniqueness in its business line correlates negatively with debt levels. Furthermore, smaller companies typically rely more on short-term debt than their larger counterparts, likely due to the substantial transaction costs they face when issuing long-term debt or equity. The study finds no conclusive evidence linking debt ratios to a firm's anticipated growth, non-debt tax shields, volatility, or collateral assets. Nonetheless, the data suggests that more profitable firms tend to have lower debt relative to their equity's market value. Using a dynamic panel model, Nouira and Bellouma (2019) examine the effects of size, profitability, and asset tangibility on capital structure choices of firms operating in the middle East and North Africa (MENA) region between 2006 and 2015. The results indicate significant impacts of these factors on firms' leverage decisions. According to the trade-off theory (Gounopoulos et al., 2013) find a positive relationship between tangibility and leverage. Several studies including (Dang, 2011; Elkhaldi & Daadaa, 2015; Bhat, Chanda, & Bhat, 2020) find a significant and positive correlation between total debt and tangibility.

However, while the pecking order theory indicates a negative relationship between tangibility and leverage, the tradeoff theory suggests a positive one. The effect of firm size on leverage level makes a subject of contradictory results. Indeed, a large firm has better access to credit than small firms. In addition, large companies often have more diffuse ownership, which decreases mechanism of controls over management decisions (Delcoure, 2007). For consequence, firms with large size face lower information costs and can increase equity more easily than small companies. Therefore, firm size has a negative effect on leverage level in the presence of asymmetric information. Agreeing to the hierarchical order theory, firm size is predictable to be negatively linked to leverage level. Indeed, the arbitrage theory suggests that large firms face financial difficulties and lower agency costs and can therefore borrow more than small firms (Dang, 2011). It follows that the size of the firm has a positive influence on the leverage level.

3.2 Macroeconomic Variables and Capital Structure

Numerous empirical studies have attention mostly on specific macroeconomic factors such as inflation, interest rates, macroeconomic conditions, stock market development etc. Touil and Mamoghli (2020) investigated the relationship between various traditional determinants of capital structure, institutional quality and leverage ratios. They find that in environments with strong institutional quality, the effects of profitability, non-debt tax shields,

and growth opportunities on leverage are intensified, while the influences of firm size and returns volatility are diminished. The authors also argue that institutional settings can impact a firm's ability to adjust to its target debt ratio in the MENA region, both directly and indirectly. Demirgui-Kunt and Maksimovic (1996) identify a negative connectivity between the stock market liquidity and both long-term and short-term debt-to-equity ratios. In the of context developing countries, Agarwal and Mohtadi (2004) find a positive correlation equity market development on the equity proportion in firms' overall capital structure, while banking sector evolution increases the debt component. According to pecking order theory, firms typically utilize internal funding sources before seeking external financing. Firms with higher levels of profitability display a preference for internal funding over leveraging, resulting in a negative relationship between profitability and leverage. This hierarchical order theory is supported by numerous studies, including those conducted by Vithessonthi and Tongurai (2015). The trade-off hypothesis postulates a positive relationship, as weaker profitability can lower the risk of bankruptcy. Kayo and Kimura (2011) find a positive relationship between profitability and leverage. Therefore, arbitrage theory shows a positive effect while pecking order theory confirms the presence of the negative effect.

Dang et al. (2019) examine the impact of stock returns on the capital structure and notice a negative and statistically significant relation between leverage and equity returns. Based on the work of Ayadi and Williams (2023), the stock market development has a positive effect on capital structure. However, Nguyen (2022) establish a negative relation between capital structure and stock market development. According to (Jõeveer, 2013), macroeconomic factors have the potential to impact leverage by taking the place of growth opportunities in the worldwide market. As a result of the limited use of equity financing in Eastern Europe, investment possibilities are largely financed through debt. Based on this, Jõeveer (2013) anticipates a positive correlation between GDP growth and leverage. Essentially, the connection between GDP growth, pecking order theory, and tradeoff theory can be established. Gounopoulos et al. (2013) find that as growth opportunities increase, firms tend to use more leverage. On the other hand, Arbitrage theory predicts that companies with strong growth opportunities are more likely to face financial difficulties and over-indebtedness Myers and Majluf (1984). The inflation rate serves as a primary indicator of a country's economic stability. An increase in the rate of inflation leads to uncertainty in the economic situation. This non-stability entails to the inability of companies to repayment their debts. For consequence, the higher inflation rate decreases the benefits of debt due to the higher bankruptcy costs of debt imposed on companies (Elkhaldi & Daadaa, 2015). In this case, investors demand a higher return for the risk they are taking. Rising interest rates increase companies' expected cost of debt, companies reduce their debt ratios. Hence, Elkhaldi and Daadaa (2015) find a negative correlation between inflation and leverage.

4. Methodology and Data

In this study, we examine all non-financial Tunisian companies that are listed on the Tunis Stock Exchange (TSE) from 2012-2021, resulting in a final sample of 24 companies. This period was marked by economic, social, and political instability in Tunisia, following the revolution and further exacerbated by the COVID crisis. In this paper, financial companies are not included due to their different capital structure. To obtain the financial and accounting information for our analysis, we manually collect data from the annual reports and TSE statistics. The approach of this research is based on quantile regressions, which investigate the impact of explanatory variables on the dependent variable at various points of the dependent variable's conditional distribution. This regression method is considered 'robust' largely because it does not rely on the assumption of normality of the error term, as reported by (Koenker, 1999).

As detailed by (Koenker, 1999), the calculation is achieved by minimizing:

Min

$$\beta \in R^K \qquad \sum_{t\in\{t:y_t\geq\chi_t\beta\}} \theta\,|y_t - x_t\beta| + \sum_{t\in\{t:y_t\geq\chi_t\beta\}} (1-\theta)\,|y_t - x_t\beta|$$

Where: y_t represents the dependent variable, x_t is the k by 1 vector of independent variables, β denotes the vector of coefficients, and θ signifies the estimated quantile. The coefficient vector b varies based on the specific quantile under estimation.

In order to consider the structure of the debt, we utilize the leverage, which is represented by the ratio of long-term liabilities to total assets, to calculate the dependent variable. This paper uses the leverage variable in line with the study of (Mokhova & Zinecker, 2014) which tests the relationship between macroeconomic factors and corporate capital structure. According to (Titman & Wessels, 1988), the determinants of capital structure choice confirms the importance of debt structure in evaluating firm value. They analyze various ratios, including the ratio of long-term liabilities to total assets, as critical variables.

The macroeconomic determinants that influence corporate capital structure decisions are closely tied to both monetary and fiscal policy dynamics (Titman & Wessels, 1988, Ahuja & Kalra, 2020). In this research, we include the Gross Domestic Product growth rate (GR) and unemployment rate (UR) to measure the level stability and economic development (Mokhova & Zinecker, 2014).

Furthermore, the model of this paper assesses the monetary conditions through variables such as interest rate (IR), inflation (INF). The interest rate variable is used to measure the financial and banking stock market level of development. The fiscal policy is determined by variables like central government debt to GDP (GD). To enhance the model, we also integrate the growth opportunities variable (*GR-OPTIONS)*. On another hand, firms with higher growth opportunities would require more funds. In light of the pecking order theory, there will be a stronger preference for external financing, especially for debt. Hence, this research expects a positive relationship between growth and leverage. Rajan and Zingales (1995) find a positive association between growth and leverage. In this study, we use a measure of growth opportunities adopted by Titman and Wessels (1988) (the percentage change in total assets). Furthermore, this research adds both firm-specific and country-specific macroeconomic factors, as used by Frank and Goyal (2009), in our analysis of the determinants of leverage. This research also includes firm size (*SIZE*) measured as the natural log of total assets, return on asset (*ROA*) calculated as net profit item dividing by total asset.

We estimate the following model:

$$LEV_{i,t} = \beta_0 + \beta_1 size + \beta_2 INF + \beta_3 GR + \beta_4 GR - OPTIONS + \beta_5 UR + \beta_6 ROA + \beta_7 GD + \beta_8 IR + \varepsilon_{i,t}$$

5. Results and Discussion

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LEVR	240	1.711	4.021	-26.804	36.075
Size	240	18.182	0.965	14.704	21.586
INF	240	0.042	0.012	0.021	0.063
GR	240	122.662	359.869	-1.917	1200
GR-OPTIONS	240	2.333	2.971	-4.037	26.042
UR	240	14.868	1.998	12.400	18.600
ROA	240	.045	0.102	-0.672	0.618
GD	240	124.63	12.791	108.500	148.200
IR	240	4.536	0.460	3.800	5.241

Source: Authors'calculations.

Table 1 provides descriptive statistics for all variables. The GDP growth rate (*GR*) (122.662) have the highest standard deviation (359.869), suggesting the variation among the firms. Leverage (*LEV*) (1.711) is smaller than the size of firms (18.182), suggesting that firm's size have little influence over the leverage. Interestingly, the inflation rate (0.042) is low and that pave way for favorable interest rate (4.536). The growth opportunities (2.333) are greater than return on assets (*ROA*) (0.045). The fiscal policy (*GD*) (124.63) is higher than unemployment rate (*UR*) (14.868), suggesting that fiscal policy is more instituted than the rate of unemployment within the firms.

Table 2. Correlation matrix

	SIZE	INF	GR	GR-OPTIONS	UR	ROA	GD	IR
SIZE	1							
INF	0.0227	1						
GR	-0.0032	0.3737	1					
GR-OPTIONS	0.111	0.0624	0.1237	1				
UR	0.0799	0.2091	0.1091	-0.0055	1			
ROA	-0.0433	-0.1901	0.1458	0.1638	-0.0592	1		
GD	0.1156	0.3068	-0.0211	-0.0121	0.6483	-0.1801	1	
IR	-0.0219	-0.3305	-0.0634	-0.0544	-0.7423	0.0419	-0.4162	1

Source. Authors'calculations.

Table 2 presents the correlation coefficients between the variables. The two alternative measures of leverage are highly correlated, with a correlation coefficient of 0.639. Among the explanatory variables, *INF* and *SIZE* show strong correlation with *GR-OPTIONS*, with correlation coefficients of 0.303, 0.111, and 0.0624, respectively. In addition, *SIZE* has a strong correlation of 0.4523 with two alternative measures of leverage. The inflation effect of a company is positively correlated with *SIZE, GR-OPTIONS* and negatively with the variables *IR*, *INF, GR-OPTIONS, UR* and *GD*.

Table 3. Empirical results from estimations of target leverage the models.

	Quantile (0.25)	**Quantile (0.50)**	**Quantile (0.75)**	**Quantile (0.90)**
Variables	LEV	LEV	LEV	LEV
SIZE	0.318***	0.653***	1.171***	2.286***
	(0.0536)	(0.0777)	(0.207)	(0.670)
INF	4.803	1.455	0.777	8.942
	(4.853)	(7.044)	(18.76)	(19.77)
GR	-2.64e-05	-5.90e-05	-2.67e-05	0.000528
	(0.000241)	(0.000350)	(0.000932)	(0.00302)
GR-OPTIONS	0.0514***	0.0745***	0.0263	0.0138
	(0.0176)	(0.0255)	(0.0679)	(0.220)
UR	0.0202	0.0546	0.0139	0.344
	(0.0591)	(0.0858)	(0.228)	(0.739)
ROA	-5.222***	-5.853***	-8.288***	-8.152
	(0.515)	(0.748)	(1.991)	(6.443)
GD	-0.00297	-0.00656	-0.0129	-0.0395
	(0.00835)	(0.0121)	(0.0323)	(0.104)
IR	0.125	0.270	0.0665	0.912
	(0.185)	(0.269)	(0.716)	(2.315)
Constant	-5.656***	-11.87***	-17.99***	-42.55**
	(1.517)	(2.202)	(5.864)	(18.97)
Observations	240	240	240	240

Note. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source. Authors'calculations.

The main objective of this study is to investigate the role firms leverage on firms' size, considering growth rate, inflation rate, interest rate, growth option, return on assets, fiscal policy and unemployment. The results are reported in Table 3 and this paper finds that the coefficient of firm size (0.318***, 0.653***, 1.171*** and 2.286***) is positive and significant at 1% in all the quantiles, suggesting that firm's size is associated with increasing firms leverage. This is likely be true because small firms could manage financial burden without any cause on the operation. Interesting, finding of this research shows that in four quarters firms' size positively connects to leverage, and the percentage on continue to increase from 0.3% in the first quantile to 0.7% in second quantile, 1.2% in third quantile, and 2.3% in fourth quantile. This is partly consistent with (Vithessonthi & Tongurai, 2015), who find that effect of leverage on operational performance is positive in firms with small size but contrasts Bhat, Chanda and Bhat (2020) who argue that firm size negatively influences the leverage in India.

The current paper also finds that the coefficient of growth option (0.0514*** and 0.0745***) is positive and significant at 1% in first and second quantile with no significant finding in third and fourth quantile, an indication that growth option is only associated with increasing leverage in the short-run. The effect of growth option is only in short-run, that is 0.05% in quantile one and 0.08% in the second quantile, an indication of increasing of over 0.02% increase of growth option influence on leverage between first quantile to the second quantile. This is possible because growth option reduces the tax advantage of debt deductibility while increase the cost of underinvestment. This is to Hayat et al. (2010), who find that growth option reduces corporate leverage.

Furthermore, the coefficient of return on assets (-5.222***, -5.853*** and -8.288***) is negative and significant at 1% in first to third quantile, with no significant influence in the fourth quantile, suggesting that return on assets is associated with reducing leverage in first, second and third quantile. This is possible since return on

assets can be used to upset the debts accrued in the production process. In other hand, this show that return on assets can reduce the leverage in the first quantile by 5.2%, and 5.9% in the second quantile and 8.3% in the third quantile, an indication increasing rate overtime. This is consistent with Choi and Richardson (2016), who find that firm assets positively influence leverage.

6. Conclusion

This paper empirically explores the effect of macroeconomic factors on the capital structure of listed Tunisian companies using data from 2012 to 2021. To estimate the determinants of capital structure, it utilizes advanced dynamic panel data estimators, specifically the Model Quantile Regression (QREG) methods developed by Koenker (1999).

The findings of the current research highlight that the cost of capital in Tunisia is influenced by various factors, including the characteristics of Tunisian family-owned companies and the current economic conditions within the country (Kouki & Ben Said, 2011, Missaoui & Bouchaddekh, 2015). Companies in Tunisia exhibit a preference for debt over capital increases, likely driven by the prevailing economic climate as well as cultural and institutional factors (Missaoui, Brahmi, & Ben, 2018). External sources of funding are often sought after by both managers and shareholders to achieve financial leverage, with alternative methods such as utilizing the financial market being rarely employed even when promotional incentives are provided. It is worth noting that Tunisian policymakers tend to align fiscal decisions with monetary authorities, particularly regarding fiscal and social benefits. Currently, the Tunisian economy contends with a combination of inflationary pressures and economic recession, leading managers to prioritize debt financing rather than raising capital. Unfortunately, this decision results in an undesirable artificial leverage known as the recession effect. While our analysis indicates a positive correlation between leverage, firm size, and GDP growth, the relationship is statistically non-significant. Based on our empirical findings, there is a clear association between macroeconomic factors and leverage, which aligns with existing international research (Kouki & Ben Said, 2011, Elkhaldi & Daadaa, 2015). The results of this research suggest that the relationship between leverage and macroeconomic determinants is consistent with both theoretical and practical implications for businesses operating in Tunisia. It is evident that financial decisions in Tunisia are influenced by the policies of monetary authorities and socioeconomic conditions (Elkhaldi & Daadaa, 2015).

Even though this research has practical and theoretical implications, there are a number of topics that might be examined in future research. A main limitation in this study is that results apply to the specificities of one country hence limitation of results to economies that relevant similar characteristics with Tunisia. In conjunction with this, the persistence and depth of the economic and institutional recession in Tunisia may seem as an extreme environment that is doubtful to be observed in emerged economies in the near future. On another hand, this particular environment is possibly the ideal context to examine and experiment with this specific issue, considering that the two individual macroeconomic states are distinctively different. Future research could examine how capital structure determinants vary in economies with less difference in macroeconomic conditions, institutional quality, and varying levels of financial integration.

Reference

Agarwal, S., & Mohtadi, H. (2004). Financial markets and the financing choice of firms: Evidence from developing countries. *Global Finance Journal, **15***(1), 57-70. https://doi.org/10.1016/j.gfj.2003.10.004

Ahuja, B. R., & Kalra, R. (2020). Impact of macroeconomic variables on corporate capital structure: A case of India. *Managerial Finance*, *47*(3), 336-355. https://doi.org/10.1108/MF-02-2020-0067

Anzuini, A., Lombardi, M. J., & Pagano, P. (2010). The Impact of Monetary Policy Shocks on Commodity Prices. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1650595

Ayadi, O. F., & Williams, J. (2023). Stock market development and capital formation in selected African economies. *Journal of Money and Business*. https://doi.org/10.1108/JMB-05-2022-0023

Belkhir, M., Maghyereh, A., & Awartani, B. (2016). Institutions and corporate capital structure in the MENA region. *Emerging Markets Review, 26*, 99-129. https://doi.org/10.1016/j.ememar.2016.01.001

Bhat, D. A., Chanda, U., & Bhat, A. K. (2020). Does Firm Size Influence Leverage? Evidence from India. *Global Business Review, 24*(1), 21-30. https://doi.org/10.1177/0972150919891616

Bui, T. N., Nguyen, X. H., & Pham, K. T. (2023). The Effect of Capital Structure on Firm Value: A Study of Companies Listed on the Vietnamese Stock Market. *International Journal of Financial Studies, 11*(3). https://doi.org/10.3390/ijfs11030100

Chakraborty, I. (2010). Capital structure in an emerging stock market: The case of India. Research in *International Business and Finance, 24*(3), 295-314. https://doi.org/10.1016/j.ribaf.2010.02.001

Dang, T. L., Ly Ho, H., Dzung, L. C., Thao, T. T., Vo, X. V., & McMillan, D. (2019). Stock liquidity and capital structure: International evidence. *Cogent Economics & Finance, 7*(1). https://doi.org/10.1080/23322039.2019.1587804

Dang, V. A. (2011). Testing capital structure theories using error correction models: Evidence from the UK, France and Germany. *Applied Economics, 45*(2), 171-190. https://doi.org/10.1080/00036846.2011.597724

Delcoure, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics & Finance, 16*(3), 400-415. https://doi.org/10.1016/j.iref.2005.03.005

Demirgui-Kunt, A., & Maksimovic, V. (1996). Stock Market Development and Financing Choices of Firms. *The World Bank Economic Review, 10*. https://doi.org/10.1093/wber/10.2.341

Drobetz, W., Gounopoulos, D., Merikas, A., & Schröder, H. (2013). Capital structure decisions of globally-listed shipping companies. *Transportation Research Part E: Logistics and Transportation Review, 52*, 49-76. https://doi.org/10.1016/j.tre.2012.11.008

El-Diftar, D. (2020). Firm-level determinants of capital structure in the MENA region. *Journal of Research in Emerging Markets, 2*(3), 1-12. https://doi.org/10.30585/jrems.v2i3.494

Elkhaldi, A., & Daadaa, W. (2015). Economic Determinants of Corporate Capital Structure: The Case of Tunisian Firms. *International Journal of Economics and Finance, 7*(9). https://doi.org/10.5539/ijef.v7n9p193

Frank, M. Z., & Goyal, V. K. (2009). Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management, 38*(1), 1-37. https://doi.org/10.1111/j.1755-053X.2009.01026.x

Harris, M., & Raviv, A. (1991). The Theory of Capital Structure. *The Journal of Finance, 46*(1), 297-355. https://doi.org/10.1111/j.1540-6261.1991.tb03753.x

Hayat, M. A., Bhatti, M. I., Raza, A., & Qureshi, A. (2010). How growth opportunities are related to corporate leverage decisions? *Investment Management and Financial Innovations, 7*(1).

Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics,* (3), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Jõeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics, 41*(1), 294-308. https://doi.org/10.1016/j.jce.2012.05.001

Karpavičius, S., & Yu, F. (2017). The impact of interest rates on firms' financing policies. *Journal of Corporate Finance, 45* 262-293. https://doi.org/10.1016/j.jcorpfin.2017.05.007

Kayo, E. K., & Kimura, H. (2011). Hierarchical determinants of capital structure. *Journal of Banking & Finance, 35*(2), 358-371. https://doi.org/10.1016/j.jbankfin.2010.08.015

Keynes, J. M. (1937). The General Theory of Employment. *The Quarterly Journal of Economics, 51*(2), 209-223. https://doi.org/10.2307/1882087

Koenker, R. (1999). *Quantile Regression*. Cambridge university press.

Kouki, M., & Ben, S. H. (2011). Capital Structure Determinants: New Evidence from French Panel Data. *International Journal of Business and Management, 7*(1). https://doi.org/10.5539/ijbm.v7n1p214

Kraus, A., & Litzenberg, R. H. (1973). A State-Preference Model of Optimal Financial Leverage. *The Journal of Finance, 28*(4), 911-922. https://doi.org/10.1111/j.1540-6261.1973.tb01415.x

Llobet-Dalmases, J., Plana-Erta, D., & Uribe, J. M. (2023). Cyclical capital structure decisions. *The North American Journal of Economics and Finance, 66*. https://doi.org/10.1016/j.najef.2023.101917

Miller, E. M. (1977). Risk, Uncertainty, and Divergence of Opinion. *The Journal of Finance, 32*(4), 1151-1168. https://doi.org/10.1111/j.1540-6261.1977.tb03317.x

Missaoui, I., & Bouchaddekh, T. (2015). L'Impact Du Developpement Du Marche Boursier Sur Le Cout Des Capitaux Propres: Validation Empirique Sur La Bvmt. *Journal of Academic Finance, 5*, 21-39. https://doi.org/10.59051/joaf.v6i1.43

Missaoui, I., Brahmi, M., & Ben, J. R. (2018). Quantitative relationship between corruption and development of the Tunisian stock market. *Public and Municipal Finance, 7*(2), 39-47. https://doi.org/10.21511/pmf.07(2).2018.04

Modiglian, F., & Miller, M. H. (1958). *The American economic Review, 48*, 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review, 53*(3), 433-443.

Mokhova, N., & Zinecker, M. (2014). Macroeconomic Factors and Corporate Capital Structure. *Procedia - Social and Behavioral Sciences, 110*, 530-540. https://doi.org/10.1016/j.sbspro.2013.12.897

Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics, 13*(1984), 187-221. https://doi.org/10.1016/0304-405X(84)90023-0

Nguyen, H. N. (2022). The Nexus Between Capital Structure and Stock Prices: Evidence from Non-agricultural Firms in Vietnam. *European Journal of Business and Management Research, 7*(4), 66-70. https://doi.org/10.24018/ejbmr.2022.7.4.1489

Nouira, A., & Bellouma, M. (2019). Capital Structure in Mena Region: A Panel Data Analysis. *Global Journal of Management and Business Research: C Finance, 19*.

Rajan, R. G., & Zingales, L. (1995). What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance, 50*(5), 1421-1460. https://doi.org/10.1111/j.1540-6261.1995.tb05184.x

Singh, B. P., & Kannadhasan, M. (2020). Corruption and capital structure in emerging markets: A panel quantile regression approach. *Journal of Behavioral and Experimental Finance, 28*. https://doi.org/10.1016/j.jbef.2020.100417

Titman, S., & Wessels, R. (1988). The Determinants of Capital Structure Choice. *The Journal of Finance, 43*(1), 1-19. https://doi.org/10.1111/j.1540-6261.1988.tb02585.x

Touil, M., & Mamoghli, C. (2020). Institutional environment and determinants of adjustment speed to the target capital structure in the MENA region. *Borsa Istanbul Review, 20*(2), 121-143. https://doi.org/10.1016/j.bir.2019.12.003

Vithessonthi, C., & Tongurai, J. (2015). The effect of leverage on performance: Domestically-oriented versus internationally-oriented firms. *Research in International Business and Finance, 34*, 265-280. https://doi.org/10.1016/j.ribaf.2015.02.016