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# Firm-level determinants of capital structure in the MENA region

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**Abstract:** This paper investigates the behavior of firm characteristics on capital structure in firms in the MENA region. The outcomes of this research are important to bridge the gap between the theory and the practical decisions related to capital structure. The research studies the impact of firm characteristics on levels of debt from three different perspectives; short-term debt, long-term debt, and total debt. The study is applied to 416 firms from nine countries of the MENA region (Bahrain, Qatar, Saudi Arabia, UAE, Oman, Kuwait, Egypt, Jordan, and Tunisia) over some time from 2007-2016. Various econometrics techniques are used to reinforce the generated results. The results show that a firm's profitability and liquidity levels have a significant inverse impact on leverage, whereas; firm's size has a direct impact. The empirical results also show that asset tangibility and market value impact leverage differently depending on the type of debt used. Overall, the results reinforce the importance of both the pecking order theory as well as the trade-off theory in explaining capital structure decisions in the MENA region, with the results being more significant concerning the pecking order theory.

**Keywords:** trade-off theory, pecking order theory, capital structure, MENA region.

**JEL codes:** G30

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## 1. Introduction

The capital structure of any firm is crucial in today's business world. The capital structure shows how firms generate their funds by trying to find the optimal mix of debt and equity. Capital structure decisions impact many aspects of the organizations, such as; levels of risk borne by shareholders, rate of returns, and profitability. Since very high levels of debt can lead to the possibility of bankruptcy, managers need to thoroughly take capital structure decisions. Decision-makers need to highly understand the nature of their firm as well as the economy to accurately take capital structure decisions. One size does not fit all when it comes to capital structure policy; therefore, the appropriate capital structure for each firm depends on its unique characteristics. This is why researching what determines capital structure decisions in corporations has been a hot research topic for many academicians.

This study is important because only a few studies have researched the determinants of capital structure in the MENA region. So, it is important to fill the gap in the literature and find out whether the results of this study align with the results of studies done in other parts of the world. This research explores how firm-level characteristics impact levels of debt in the MENA region.

Unlike many developed economies, the MENA region still suffers from a weak institutional environment and low investor protection, which may impact the cost of acquiring funds (Belkhir et al., 2016). Also, the MENA region still suffers from transparency problems as well as poor financial infrastructure. Countries in the MENA region need much more improvement to become more in line

with globally accepted best practices. So, it very important to study the behavior of financial variables in an environment subject to continuous policy reforms.

Theoretically speaking, firm-level factors should similarly impact corporate leverage regardless of the region or country at which the study is applied. Therefore, the objective of this study is to investigate whether firm-level factors impact leverage in firms operating in the MENA region the same way they do in more advanced developed economies. This research also studies debt from three different perspectives; short-term debt, long-term debt, and total debt.

The paper will proceed as follows: theoretical framework, literature review and hypotheses development, research methodology, results and discussion, and conclusion.

## **2. Theoretical Framework**

Three important theories help in understanding what impacts the capital structure of firms (Luigi and Sorin, 2009). They are the trade-off theory, pecking order theory, and market-timing theory.

The trade-off theory assumes that firms try to find the optimal mix of debt and equity after accounting for market imperfections such as taxes and bankruptcy costs (Luigi and Sorin, 2009; Shahar et al., 2015). In this sense, the trade-off theory implies that firms will set a target debt level that may vary according to business characteristics (Serghiescu and Videan, 2014). The theory suggests that firms will trade-off between the tax shield benefit of debt and financial distress that may be caused by too much debt (Luigi and Sorin, 2009). Here, managers are assumed to increase debt to the point where the costs and benefits of any additional debt are exactly equal, and this will be the firm's optimal capital structure. Therefore, the trade-off theory assumes that firms trade off the costs and benefits of debt and equity to reach their optimal debt ratio (Abeywardhana, 2017).

On the other hand, the pecking order theory assumes that due to information asymmetry between various parties, firms will first rely on internal sources of funds before considering external ones (Luigi and Sorin, 2009; Serghiescu and Videan, 2014). Here, managers are assumed to choose the least expensive source of capital first then move to more costly options when the lower-cost sources are no longer an option. So, the pecking order theory does not imply that firms will set an optimal capital structure but that they rather depend on internal finance (Luigi and Sorin, 2009) in an attempt to eliminate inefficiencies caused by asymmetric information. The greater the firm's profitability, the greater their ability to accumulate retained earnings; thus, the lower their need to borrow. So, the pecking order theory suggests that firms will borrow more when they do not have sufficient internal funds (Abeywardhana, 2017). Conclusively, under this theory firms will use retained earnings first as it is viewed as the least expensive source of capital, then use debt, and as their last resort, issue new equity (Adair and Adaskou, 2015).

Lastly, the market-timing theory argues that the capital structure of a firm is impacted by how its stock is priced in the market. For instance, if the firm's stock is overvalued, the firm will issue new stocks and if it is undervalued, the firm will buy back its shares (Luigi and Sorin, 2009). Therefore, the theory suggests that firms have an incentive to take advantage of their high share prices by issuing more shares and vice versa (Fatoki and Nasieku, 2017). Market-timing theory, therefore, assumes that firms do not move toward a target debt level because equity transactions will be dependent on conditions of the stock market. Accordingly, it is assumed that the share price is taken into account while making capital structure decisions (Alipour et al., 2015).

## **3. Literature Review and Hypotheses Development**

From the theoretical framework and previous literature, numerous firm characteristics have been found to have an impact on a firm's level of debt. In this section of the paper, these firm characteristics will be identified, as well as how they are most likely to impact levels of debt in the MENA region. Firm characteristics that were found to have an impact on levels of debt include firm's size, profitability, liquidity, asset tangibility, and market value (e.g. Psillaki and Daskalakis, 2009; Latridis and Zaghmour, 2013; Serghiescu and Videan, 2014; Li and Islam, 2019; Nouria and Bellouma, 2019).

### 3.1 Size

The trade-off theory implies that there will be a positive relationship between size and levels of debt (Koksal and Orman, 2015). This is because larger firms usually have lower bankruptcy risk making it easier for them to have less costly sources of external funds (Psillaki and Daskalakis, 2009; Li and Islam, 2019).

Numerous studies have supported a positive impact of a firm's size on leverage levels (e.g. Psillaki and Daskalakis, 2009; Latridis and Zaghmour, 2013; Koksal and Orman, 2015; Li and Islam, 2019). Also, Yousef (2019) evidenced a significant positive impact of the firm's size on different measures of debt when he applied his study on the real estate sectors in GCC countries and the United Kingdom. On the other hand, Noura and Bellouma (2019) have evidenced a negative effect of a firm's size on levels of debt when they applied their study in the MENA region. According to the theoretical framework and the results of the majority of literature, the first hypothesis is formulated:

*H1; there is a positive association between the firm's size and levels of debt in the MENA region.*

### 3.2 Profitability

According to the trade-off theory, firms with high profitability levels will tend to increase their debt levels to benefit from tax savings. This notion is supported by Sakr and Bedeir (2019) when they applied their study on the Egyptian market. Fatoki and Nasieku (2017) also suggest that firms with high profitability tend to increase their debt levels to benefit from the lower debt financing costs.

On the other hand, the pecking order theory indicates the opposite, because firms with high profitability tend to have more retained internal funds that they can rely on, and hence, have less need for external funds (Koksal and Orman, 2015; Haron, 2016; Khemiri and Noubbigh, 2018). For instance, latrines and Zaghmour (2013) found that profitability has a significant inverse impact on capital structure when applied in both Morocco and Turkey. Many researchers have also evidenced this inverse relationship between profitability and levels of debt (e.g. Serghiescu and Videan, 2014; Adair and Adaskou, 2015; Koksal and Orman, 2015; Li and Islam, 2019; Noura and Bellouma, 2019; Yousef, 2019). Since the theoretical framework shows contradicting evidence concerning the impact of profitability on leverage levels, the second hypothesis is developed as follows:

*H2; profitability impacts levels of debt in the MENA region either positively (according to the trade-off theory) or negatively (according to the pecking order theory).*

### 3.3 Asset tangibility

Moreover, firms with higher asset tangibility provide greater assurance to creditors and therefore positively impact leverage levels. This goes under the trade-off theory suggesting that since tangible assets can be used as collaterals, creditor risk will be reduced, which in return attracts more debt. According to the previous literature, numerous studies (e.g. Adair and Adaskou, 2015; Khemiri and Noubbigh, 2018; Noura and Bellouma, 2019) supported a statistically significant positive effect of asset tangibility on leverage following the trade-off theory.

On the other hand, and in line with the pecking order theory, the greater the asset tangibility, the less leverage (Adair and Adaskou, 2015). Many researchers (e.g. Psillaki and Daskalakis, 2009; Sheikh and Wang, 2011; Latridis and Zaghmour, 2013; Serghiescu and Videan, 2014) witnessed a significant negative impact of tangibility on leverage. However, when Koksal and Orman (2015) applied their study on major developing economies, they found mixed results about asset tangibility. They witnessed a significant inverse impact on short-term debt and a significant positive effect on long-term and total debt models. So, by the theoretical framework and previous literature, there are mixed effects of asset tangibility, suggesting the next main hypothesis:

*H3; asset tangibility impacts levels of debt in the MENA region either positively (according to the trade-off theory) or negatively (according to the pecking order theory).*

### 3.4 Liquidity

By the trade-off theory, firms with higher liquidity provide greater assurance for creditors, and therefore may positively impact debt levels. So, the theory assumes that the greater the liquidity, the better the ability of firms to meet their credit obligations, the more motivated they are to borrow (Sheikh and Wang, 2011; Abdulla, 2015). Abdulla (2015) evidenced a positive relationship between leverage and liquidity when she applied her study to the UAE. Alipour et al. (2015) also found that liquidity has a positive impact on short-term debt when they applied their study on the Iranian market.

On the other hand, according to the pecking order theory, firms with higher liquidity are obligated to use these funds first before considering external sources of financing. This suggests that liquidity will harm debt, since the higher the firm's liquidity, the greater the availability of internal funds that can be used (Serghiescu and Videan, 2014; Haron, 2016; Khemiri and Noubbigh, 2018). When Khemiri and Noubbigh (2018) applied their study on sub-Saharan African firms, they found that liquidity shows a significant inverse impact on the debt. Also, when applied to Romanian firms, Serghiescu and Videan (2014) supported the same results. Moreover, when they applied their study on the manufacturing industry in Pakistan, Sheikh and Wang (2011) found the same result. Alipour et al. (2015) found that liquidity harms long-term debt. So, according to the theoretical framework and previous literature, the third hypothesis is developed:

*H4; liquidity impacts levels of debt in the MENA region either positively (according to the trade-off theory) or negatively (according to the pecking order theory).*

### 3.5 Market value

According to the market-timing theory, stock performance has a great impact on the determination of capital structure. When a firm reports a strong share price, they will be more motivated to issue equity; while, on the other hand, having a low stock price may push the firm into repurchasing back its stocks (Haron, 2016). So, the theory suggests that when the firm's stock is overvalued, the firm will tend to issue more stocks, thus, relying more on equity than debt in financing its investments. Sarwendhi and Samekto (2014) supported this theory as they applied their study on the Indonesian Stock Exchange and evidenced a negative impact of market-to-book ratio on leverage levels. Haron (2016) and Hang et al. (2015) also support this theory by finding that the stronger the equity's performance, the greater the preference of equity capital over debt. Alipour et al. (2015) found the same result when they applied their study on the Iranian market. So, consistent with the market-timing theory, the fifth main hypothesis is formulated:

*H5; there is an inverse association between the firm's market value and levels of debt in the MENA region.*

## 4. Research Methodology

### 4.1 Data collection

The data for the research is collected for a period of 10 years from 2007 to 2016 on a sample of 416 listed companies from nine countries from the MENA region. Six GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE) and three non-GCC countries (Egypt, Jordan, and Tunisia). The data is collected from Thompson Reuters Datastream.

The sample excluded all firms belonging to the financial sector. The tested firms belong to the following industries: real estate, IT, telecom, utilities, healthcare, consumer staples, consumer discretionary, materials, and energy. Based on the explained selection criteria and after the removal of all missing data, the final sample size became 3966 firm-year observations.

### 4.2 Dependent variables

To fully explore the determinants of debt, it will be accounted for as follows: short-term debt ratio, long-term debt ratio, and total debt ratio.

### 4.3 Independent variables

As explained in the literature review, five main firm characteristics help in determining leverage levels. These characteristics are the firm's size, profitability, tangibility, liquidity, and market value.

### 4.4 Empirical models

$$\text{Short-term debt} = \beta_0 + \beta_1 \text{ size} + \beta_2 \text{ profitability} + \beta_3 \text{ tangibility} + \beta_4 \text{ liquidity} + \beta_5 \text{ market value} + \varepsilon \quad (1)$$

$$\text{Long-term debt} = \beta_0 + \beta_1 \text{ size} + \beta_2 \text{ profitability} + \beta_3 \text{ tangibility} + \beta_4 \text{ liquidity} + \beta_5 \text{ market value} + \varepsilon \quad (2)$$

$$\text{Total debt} = \beta_0 + \beta_1 \text{ size} + \beta_2 \text{ profitability} + \beta_3 \text{ tangibility} + \beta_4 \text{ liquidity} + \beta_5 \text{ market value} + \varepsilon \quad (3)$$

Dependent variables:

- Short-term debt: short-term debt ratio measured by total short-term debt divided by total assets.
- Long-term debt: long-term debt ratio measured by total long-term debt divided by total assets.
- Total debt: total debt ratio measured by total debt divided by total assets.

Independent variables:

- Size: firm's size measured by the natural logarithm of total sales
- Profitability: firm's profitability measured by earnings before interest and taxes (EBIT) divided by total assets.
- Tangibility: firm's asset tangibility measured by total fixed assets divided by total assets.
- Liquidity: firm's liquidity measured by current assets divided by current liabilities.
- Market value: the market value per share measured by the market price per share divided by book value per share.

### 4.5 Statistical models

The previous models are tested using various econometrics techniques. The empirical part starts with a discussion of the descriptive and bivariate results. Then, a parametric-based pooled ordinary least squares (OLS) regression is conducted and backed up by panel regression. The panel regression is fixed or random effects depending on the results of the Hausman test. Regression conditions such as multicollinearity, linearity, and homoscedasticity are checked to determine the most appropriate statistical technique to use. Also, the industry, year, and region (GCC or not) are included in the regression models as dummy variables to take into account their impact. For an additional robustness check, the Tobit regression will be utilized since leverage levels or dependent variables are censored between 0 to 100%.

## 5. Results and Discussion

### 5.1 Descriptive statistics and bivariate analysis

By looking at the results of the descriptive statistics as provided in Table 1, the average short-term and long-term debts are around 10%. While total debt has an average of about 20%. This indicates that countries in the MENA region rely mostly on equity rather than debt in financing their assets. The mean value for profitability is about 7%, while that of tangibility is 56.5%. Average liquidity is 274%, meaning that companies in the MENA region are highly liquid.

Table 2 shows the Pearson correlation coefficients between all tested variables. As can be noted, no two independent variables are found to have a 0.8 correlation or higher. This indicates that multicollinearity will not be a problem. For bivariate analysis, the results in Table 2 evidence a significant positive correlation between a firm's size and both long-term and total debt ratios. The results further show that profitability and liquidity have significant inverse correlations with all debt measures. While tangibility shows an inverse correlation with short-term debt and a positive correlation with long-term and total debt.

**Table 1.** Descriptive Statistics

Variable	Minimum	Maximum	Mean	SD
Short term debt	.000	.782	.09954	.119568
Long term debt	.000	.790	.09943	.138055
Total debt	.000	.834	.19898	.184397
Size	.000	19.062	11.58496	2.708374
Profitability	-.672	.841	.07075	.099608
Tangibility	.000	.998	.56499	.230694
Liquidity	.046	200.250	2.74453	7.050583
Market Value	-981.250	132.660	1.62273	16.121289
Valid N	3966			

Note. This table provides the descriptive statistics of the dependent and independent variables used.

**Table 2.** Pearson Correlation Coefficients

	Short term debt ratio	Long term debt ratio	Total debt Ratio	Market value	Size	Profitability	Tangibility	Liquidity
Short term debt ratio	1	.020	.663**	-.051-**	.029	-.236-**	-.166-**	-.171-**
Long term debt ratio	.020	1	.761**	.004	.257**	-.118-**	.354**	-.115-**
Total debt ratio	.663**	.761**	1	-.031	.211**	-.241-**	.157**	-.197-**
Market value	-.051-**	.004	-.031	1	.012	.047**	-.032-*	.002
Size	.02	.257**	.211**	.012	1	.274**	-.023	-.201-**
Profitability	-.236-**	-.118-**	-.241-**	.047**	.274**	1	-.159-**	.059**
Tangibility	-.166-**	.354**	.157**	-.032-*	-.023	-.159-**	1	-.135-**
Liquidity	-.171-**	-.115-**	-.197-**	.002	-.201-**	.059**	-.135-**	1

Note. This is the Pearson correlation matrix of all the variables. \*\*. Correlation is significant at the 0.01 level (2-tailed). \*. Correlation is significant at the 0.05 level (2-tailed).

## 5.2 Multivariate analysis

The study further proceeds with running a pooled OLS regression for all three models. As was previously discussed and by the Variance Inflation Factors (VIF) results in Tables 3, 4, and 5, multicollinearity does not seem to exhibit a problem. An OLS regression is run twice for each model, once with the original data and another time with the independent variables transformed into their natural logarithm. This is done to reinforce the results and to overcome any deviation from linearity and homoscedasticity.

By referring to Table 3, the firm's size seems to show inconclusive results. It shows a highly significant positive relationship with short-term leverage under OLS but an insignificant result under transformed OLS. On the contrary, Tables 4 and 5 evidence a highly significant positive impact of a firm's size on both long-term debt and total debt under both regression models. Also, as provided in Table 6; when a fixed-effects panel regression is run, highly significant positive relationships between the firm's size and all debt levels are evidenced. From all the generated results, it is concluded that a firm's size does positively impact leverage levels, thus; hypothesis one is accepted. This indicates that larger firms in the MENA region have higher debt levels than their smaller counterparts and this maybe because it is easier for them to find less costly sources for external funds. This conclusion is in line with the trade-off theory and with the majority of previous literature (e.g. Latridis and Zaghmour,

2013; Koksai and Orman, 2015; Yousef, 2019). However, it is contradicting to the results generated by Nouira and Bellouma (2019) when they applied their study in the MENA region.

**Table 3.** Short-Term Debt OLS Regression Results.

Variable	OLS			Trans. OLS		
	Coef.	T	Sig.	Coef.	t	Sig.
Constant	.163	16.127	.000	.068	5.865	.000
Size	.003	3.928	.000	-.001	-.986	.324
Profitability	-.343	-18.311	.000	-.019	-10.137	.000
Tangibility	-.113	-13.883	.000	-.065	-22.197	.000
Liquidity	-.003	-10.558	.000	-.082	-35.708	.000
Market Value	-.0004	-.402	.688	-.005	-2.013	.044
GCC (gcc = 1, non-gcc =0)	.006	1.594	.001	.011	3.222	.001
Year dummies		Yes			Yes	
Industry dummies		Yes			Yes	
N		3966			3966	
R2		.150			.355	
Adj. R2		.147			.352	
F(sig.)		46.651(.000)			122.942(.000)	
VIF						
Highest		1.283			1.306	
Average		1.124			1.231	

*Note.* This table provides the results for the Ordinary Least Squares (OLS). The dependent variable is the short-term debt ratio. The regression was run twice, once with the original variable values and another time with transformed independent variables.

**Table 4.** Long-Term Debt OLS Regression Results.

Variable	OLS			Trans. OLS		
	Coef.	T	Sig.	Coef.	t	Sig.
Constant	-.194	-17.84	.000	-.057	-3.709	.000
Size	.014	18.015	.000	.011	12.568	.000
Profitability	-.195	-9.740	.000	-.024	-9.512	.000
Tangibility	.187	21.525	.000	.049	12.826	.000
Liquidity	-.0001	-.211	.833	-.015	-5.091	.000
Market Value	-.0002	-4.183	.000	.011	3.458	.001
GCC (gcc = 1, non-gcc = 0)	.023	5.708	.000	.038	8.541	.000
Year dummies		Yes			Yes	
Industry dummies		Yes			Yes	
N		3966			3966	
R2		.278			.268	
Adj. R2		.275			.265	
F(sig.)		101.395(.000)			82.099(.000)	
VIF						
Highest		1.283			1.306	
Average		1.124			1.231	

*Note.* This table provides the results for the Ordinary Least Squares (OLS). The dependent variable is the long-term debt ratio. The regression was run twice, once with the original variable values and another time with transformed independent variables.

The results in Tables 3, 4, and 5 show that profitability has a highly significant inverse relationship with all levels of leverage (all significant at 1%) under both OLS and Transformed OLS. Furthermore, when a panel regression is used as provided in Table 6, the results also show highly significant inverse relationships with all debt levels. These outcomes lead to the acceptance of the predictions of the

pecking order theory in hypothesis two. These results are consistent with the pecking order theory and with the notion that firms with higher profitability levels have more retained earnings to use and hence; rely less on external sources of funds. This conclusion is in line with the results of many previous studies that were conducted in different countries (e.g. Serghiescu and Videan, 2014; Koksal and Orman, 2015; Li and Islam, 2019; Nouira and Bellouma, 2019).

**Table 5.** Total Debt OLS Regression Results.

Variable	OLS			Trans. OLS		
	Coef.	T	Sig.	Coef.	t	Sig.
Constant	-.030	-1.993	.046	.011	.603	.546
Size	.017	15.559	.000	.011	9.529	.000
Profitability	-.538	-19.287	.000	-.043	-13.880	.000
Tangibility	.074	6.111	.000	-.016	-3.260	.001
Liquidity	-.003	-7.244	.000	-.097	-25.984	.000
Market Value	-.0002	-3.271	.001	.006	1.554	.120
GCC (gcc = 1, non-gcc = 0)	.017	3.023	.003	.049	8.860	.000
Year dummies		Yes			Yes	
Industry dummies		Yes			Yes	
N		3966			3966	
R2		.210			.341	
Adj. R2		.207			.338	
F(sig.)		70.187(.000)			115.683(.000)	
VIF						
Highest		1.283			1.306	
Average		1.124			1.231	

*Note.* This table provides the results for the Ordinary Least Squares (OLS). The dependent variable is the total debt ratio. The regression was run twice, once with the original variable values and another time with transformed independent variables.

By referring to the results of asset tangibility, the outcomes are mixed. When its impact on short-term debt is tested as shown in Table 3, the results evidence a highly significant inverse relationship (significant at 1%). This result is further backed up by the results of the panel regression in Table 6. This makes sense because tangibility is a measure of fixed assets and fixed assets are usually financed by long-term debt. Also, usually fixed assets are used as collaterals for long-term debts not short-term, so the greater the tangibility the greater the ability to get more long-term debt. This is proven by the results in Table 4 and further supported by the panel regression in Table 6. As can be noted, tangibility shows a highly significant positive impact on long-term debt. These results are consistent with the results of Koksal and Orman (2015) who also evidence an inverse relationship with short-term debt and a positive relationship with long-term debt. When total debt is used as a proxy for leverage, the results in Table 5 are mixed; significantly positive under OLS and negative under transformed OLS. But, when a panel regression is run, the outcomes in Table 6 show a highly significant positive impact of tangibility on total debt. Overall, it is found that the impact of asset tangibility on leverage differs depending on the type of debt used. The generated results support the trade-off theory only when long-term and total debts are used as proxies for leverage and support the pecking order theory when short-term debt is used. So, the results about tangibility are mixed as was predicted; thus, accepting hypothesis three.

It is hypothesized that according to the pecking order theory, the firm's liquidity level is inversely associated with levels of debt. This notion is supported by the pooled OLS results in Tables 3, 4, and 5, which show highly significant inverse associations with all debt levels. However, the results of the panel regressions in Table 6 show mixed results. But overall the outcomes do support an inverse relationship and lead to the acceptance of the predictions of the pecking order theory in hypothesis four. The results are consistent with the pecking order theory that suggests that firms should use



internal funds first before considering external sources. Also, since companies in the MENA region are prone to higher costs of debt than their counterparts in more developed countries, it may seem logical for them to use internal funds first before resorting to debt. This outcome is consistent with the results of Sheikh and Wang (2011); Serghiescu and Videan (2014); Khemiri and Noubbigh (2018); Sakr and Bedeir (2019).

**Table 6.** Fixed Effects Panel Regression Results.

Variable	Short-term Debt			Long-term Debt			Total Debt		
	Coef.	T	Sig.	Coef.	T	Sig.	Coef.	T	Sig.
Constant	0.047	1.72	0.086	-0.164	-5.77	0.000	-0.117	-3.30	0.001
Size	0.008	3.93	0.000	0.014	6.06	0.000	0.022	7.87	0.000
Profitability	-0.197	-12.02	0.000	-0.092	-5.40	0.000	-0.289	-13.54	0.000
Tangibility	-0.050	-3.69	0.000	0.195	13.68	0.000	0.144	8.13	0.000
Liquidity	-0.001	-3.99	0.000	0.001	2.47	0.014	-0.0004	-1.09	0.277
Market Value	-0.0002	-2.05	0.041	-0.000	-0.83	0.407	-0.0001	-2.24	0.025
N		3966			3966			3966	
Hausman test		0.000			0.000			0.000	
R2		0.0845			0.2088			0.1327	
F(sig.)		37.75(.000)			54.46(.000)			73.97(.000)	

Note. This table provides the results for the fixed-effects panel regression.

Lastly, the results show inconclusive results on the impact of market values on debt levels. As provided in Table 3, the firm's market value tends to show a significant inverse impact on short-term debt under OLS with transformed variables. This was further supported by the results of the panel regression in Table 6. However, when its impact on long-term debt is tested, inconsistent results are generated: significant inverse under OLS (Table 4); significant positive under transformed OLS (Table 4); insignificant under panel (Table 6). Results are also inconsistent for total debt. These outcomes are inconsistent with previous literature (e.g. Hang et al., 2015). Thus, this may indicate that results on market value tend to support the market-timing theory only when short-term debt is used as a proxy for leverage. So, when their stocks are overvalued in the market, firms in the MENA region tend to show only a reduction in their short-term borrowings. So, hypothesis five can only be accepted when it comes to short-term debt, otherwise, it is rejected. This may be since ownership of firms in the MENA region tends to be highly concentrated.

GCC economies are characterized by low tax rates and high liquidity (Zeitun and Saleh, 2015). So, this means that debt financing in GCC countries most probably will not be motivated by the benefit of shielding profits from taxes, and since market liquidity is high, the cost of borrowing will be lower. As can be noted from the outcomes in Tables 3, 4, and 5, GCC countries show to have higher leverage than non-GCC countries. This is shown by a highly significant positive GCC dummy variable in all three regression models. As discussed, this may be due to GCC companies having a lower cost of debt than non-GCC, which may encourage them to borrow more. This is consistent with the outcomes of Zeitun and Saleh (2015) which indicate that firms in GCC countries borrow more than they need. Yousef (2019) found that leverage in GCC firms is much lower than that of the UK firms and attributed this to the lower cost of debt in the UK. So, the more leverage in GCC countries over their non-GCC counterparts in the MENA region may also be attributed to the lower cost of borrowing in the GCC. Finally, the results show a significant impact of many industries on leverage, indicating the importance of the industry the firm belongs to in influencing capital structure decisions.

### 5.3 Robustness Checks

Since levels of debt are censored, a Tobit regression is run as a robustness check for the results. Overall, the outcomes in Table 7 confirm the previous analysis. The firm's size shows a significant positive impact on long-term debt and total debt. Profitability and liquidity show significant inverse relationships with all debt levels. Tangibility shows a significant inverse impact on the short-term and

significant positive impact on long-term and total debts. Market value shows only a significant inverse relationship with short-term debt. Finally, GCC still shows a significant positive result with all levels of debt.

**Table 7.** Tobit Regression Results.

Variable	Short-term Debt		Long-term Debt		Total Debt	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Constant	0.311	0.000	-0.319	0.000	-0.016	0.351
Size	-0.001	0.255	0.022	0.000	0.020	0.000
Profitability	-0.272	0.000	-0.302	0.000	-0.617	0.000
Tangibility	-0.200	0.000	0.256	0.000	0.068	0.000
Liquidity	-0.042	0.000	-0.007	0.000	-0.019	0.000
Market Value	-0.0003	0.000	0.0002	0.301	-0.0002	0.307
GCC (GCC = 1, non-GCC = 0)	0.0112	0.003	0.036	0.000	0.026	0.000
N	3966		3966		3966	

*Note.* This table provides the results for the Tobit regression.

## 6. Conclusion

This study explored the impact of firm-specific factors on different levels of leverage in the MENA region. It can be concluded that theories of capital structure adequately explain the behavior of firm characteristics towards their impact on debt levels in the MENA region. There are no main deviations from the theory when it comes to studying the impact of firm characteristics on firm leverage. Depending on the studied firm-specific factor, it can be noted that the pecking order theory and the trade-off theory adequately explain capital structure decisions of firms in the MENA region, whereas; little evidence supports the market-timing theory.

Overall, the outcomes show that in firms of the MENA region, profitability and liquidity levels tend to inversely impact the firm's leverage, as they would rather depend on internal funds first before borrowing. This goes under the pecking order theory and indicates that firms in this region may tend to be more conservative in their capital structure decisions. The firm's size shows to have a direct impact on levels of debt as was expected. The firm's tangibility and market value evidence mixed results depending on the type of debt used.

This study provides an understanding of the behavior of firms operating in the MENA region suggesting that capital structure decisions hinge around certain firm-specific factors. The results of the study also show that both the trade-off theory and the pecking order theory play an adequate role in explaining capital structure decisions in the MENA region, with the pecking order being more favored. Moreover, the results indicate that market-timing theory is not as important when it comes to capital structure decisions by firms in the MENA region. The outcomes of this study may be of benefit to policymakers, creditors, and investors in the MENA region. It is recommended that both investors and lenders to fully understand the firm's behavior towards its capital structure to be able to take adequate decisions.

As with many research studies, this research is prone to limitations. One main limitation is the removal of firms with missing data. Also, some countries of the MENA region were not included in the study due to the unavailability of data. With regards to recommendations for future research, it is advisable to extend this study by exploring how firms in different industries behave towards capital structure by concentrating the study on the nature of each industry. There are also numerous opportunities for future research in this area. For instance, a comparative study between firms in the MENA region and firms in more developed economies can be conducted to thoroughly understand differences in firm behavior towards capital structure decisions. This may concentrate on how cultural differences can impact the behavior of financial variables in the MENA region. Also, future studies may include moderating variables that may impact the relationship between firm-specific factors and leverage. Such variables may include corporate governance factors, such as; disclosure and

transparency, ownership structure, the board of directors, etc. It would also be of great benefit if qualitative research is conducted in this area, such as; conducting interviews or panel discussions with officials representing corporations, financial institutions, government, and academics.

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