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RESEARCH ARTICLE

Investigating the relationship between Capital Structure and Firm Performance Moderated by Corporate Governance Evidence from Egyptian SMEs Listed in NILEX Stock Exchange

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ABSTRACT

This study examines the quantitative relationship between the capital structure as determined by short-term debt ratio and corporate governance characteristics, and the performance of SMEs as indicated by return on assets (ROA), return on equity (ROE), and Tobin-Q. The descriptive statistics show that short-term debt is the main source of funding for SMEs in Egypt. The findings of the panel data analysis, which was utilized to estimate the impact of short-term debt on SME performance, indicate that ROE and Tobin-Q performance of SMEs are determined by short-term debt. Audit committee is also determinant to SMEs' ROA and ROE and plays as moderating role in the link between short-term debt ratio and these performance indicators. Even though long-term debt does not influence any of the performance metrics for SMEs, CEO duality does have a moderating effect on ROE and Tobin's Q, and board composition only moderates Tobin's Q. Firm size is positively affecting ROA and ROE of SMEs but Tobin's Q.

INTRODUCTION

Established in 1883, The Egyptian Stock Exchange (EGX) is the primary stock exchange in Egypt and among the largest in the Middle East and Africa with a valuation of almost $65 billion on the market as of 2021. About 250 publicly traded companies across multiple industries, including consumer goods, real estate, finance, and telecommunications throughout EGX (Reuters Report, "Egypt's Stock Exchange Sees Surge in Trading Activity, 2022).

The EGX is composed of several indices, which track the performance of different segments of the market. The most widely followed index is the EGX 30, which is a price-weighted index that tracks the 30 largest and most liquid companies listed on the EGX. Other indices include the EGX 70, EGX 100, and EGX 200, which track smaller and less liquid companies.

With an average daily trading volume of over 150 million shares, the EGX's average daily trading value was roughly $45 million in 2020. In 2020, the EGX witnessed a notable rise in trading activity,

propelled by a notable upsurge in the involvement of retail investors and robust outcomes in multiple crucial industries, including real estate and finance. Some of the key EGX indicators are included in the table below.

Table (1): EGX indicators

Statistic	Value
Total Market Capitalization	$65 billion (as of 2021)
Number of Listed Companies	Over 250
Indices	EGX 30, EGX 70, EGX 100, EGX 200
Average Daily Trading Value (2020)	$45 million
Average Daily Trading Volume (2020)	Around 150 million shares
Main Regulator	Financial Regulatory Authority (FRA)

Source: Egyptian Stock Exchange (EGX), "Market Information," <https://www.egx.com.eg/English/MarketInformation/Pages/marketinformation.aspx>

The EGX is regulated by the Financial Regulatory Authority (FRA), which is responsible for overseeing all aspects of the Egyptian financial markets, including securities, insurance, and non-banking financial institutions. The FRA is an independent regulatory body, and is tasked with ensuring transparency, fairness, and stability in the Egyptian financial markets (Financial Regulatory Authority (FRA, 2024).

Medium-sized and small businesses account for around 75% of economic growth and 80% of employment in Egypt, making them crucial to the country's economy. Even though these businesses are extremely important, they frequently run into financial problems when they try to grow and enter new markets. Therefore, SMEs are generally entitled to specific government support and benefit programs, fewer burdensome regulations, and/or reduced corporate tax rates. For example, small enterprises in Europe might have as few as 50 employees, whereas medium-sized companies can have as many as 250 employees. In the US, the number of employees, revenues, and ownership structure all play a role in determining what constitutes a small business. The Central Bank of Egypt (CBE) classifies businesses as medium-sized if their revenue is between EGP 50 million and 200 million, and as small if it is between EGP 1 million and 50 million.[1]

In 2016, CBE unveiled a plan to promote medium- and long-term loans to small and medium-sized enterprises. Banks had to set aside 20% of their whole credit portfolios for SMEs. The aim was for banks to provide EGP 200 billion to fund 350,000 businesses and generate 4 million new employment opportunities. As a result, Egyptian banks began lending more money to small and medium-sized businesses (SMEs); by 2019, the total amount of loans given to SMEs had increased to EGP 146 billion.[2]

The Egyptian Stock Exchange has taken significant steps to facilitate the listing and trading of small and medium-sized enterprises (SMEs) through the establishment of NILEX in 2007. NILEX provides a platform for SMEs to raise capital and access the Egyptian capital markets, thereby supporting their growth and development, which is crucial to the country's economy. NILEX has its own set of regulations and listing requirements tailored to SMEs, such as relaxed listing standards and reduced transparency requirements compared to the Main Market[3].

In addition, the Egyptian Exchange has implemented programs like the NILEX Sponsorship Program to provide guidance and assistance to SMEs seeking to list on NILEX, further promoting the growth

of these businesses. The EGX also offers specialized financing options and advisory services for SMEs through partnerships with various organizations and financial institutions[4].

The establishment of NILEX and the promotion of SME listings are essential to the EGX's efforts to expand its market offerings, improve liquidity, and support Egypt's overall economic growth by enhancing SMEs' access to finance. NILEX offers distinct listing standards for SMEs, such as lower minimum capital requirements and reduced disclosure obligations, compared to the Main Market. The following table shows the important statistics about NILEX as of December 2022.

Table (2): SMEs' Statistics in NILEX†

Statistic	Value
Number of Listed Companies	31
Market Capitalization	EGP 5.2 billion (approx. USD 170 million
Trading Volume (Shares)	274.6 million shares
Trading Value (LE)	EGP 406.6 million
Top Sectors	Manufacturing, Construction, Food & Beverages, IT
Number of IPOs (2022)	2
Minimum Capital Requirement	EGP 10 million

† Source: Egyptian Exchange Initiatives for SMEs:

https://www.egx.com.eg/english/SME_Initiatives.aspx

The Nile Stock Exchange, established in 2007, has yet to fulfill its purpose of assisting small and medium-sized enterprises (SMEs) in their growth and development. Over the years, the market has faced limited company registration, with only 28 companies listed as of December 2023, and trading volumes that barely reach one million per day.

In an attempt to support listed SMEs with robust growth and solid fundamentals, the SMEs Market rebranded its small-cap index, Tamayoz, in June 2021. The revamped index added eight components based on specific listing criteria, including positive cash flows for two years, a minimum free float of 10%, and a four-year revenue compound annual growth rate of 10%+ (or revenues over EGP 10 million for four consecutive years). The index holds promising potential, with ten more SMEs seeking to join the SMEs Market as of December 2023.

Implementing corporate governance mechanisms can help SMEs reduce conflicts of interest and enhance their financial performance by increasing the company's value and return on investment for shareholders. In 2023, listed firms must comply with the corporate governance regulations and recommendations published by the Egyptian Financial Regulatory Authority (FRA), which supervises the EGX. The FRA requires listed firms to submit an annual corporate governance report detailing their adherence to corporate governance norms and principles[v].

Consequently, the purpose of this paper is to examine the effects of corporate governance and capital structure on the performance of 23 SMEs that were listed between 2017 and 2022 on the NILEX stock exchange in Egypt including ROA, ROE and Tobin's Q. The structure of the paper is as follows: This introduction is followed by a review of literature and the development of hypotheses. Next, models, data, and empirical analysis are covered. The results and policy implications are concluded in the final section.

Literature Review and Hypothesis Development

The impact of capital structure and corporate governance on the performance of small and medium-sized businesses (SMEs) is complex and multidimensional. There have been contradictory findings

from recent capital structure research. For instance, Suu et al. (2021) found that while leverage increased return on equity (ROE) and Tobin's Q, it decreased return on assets (ROA). Moreover, Bui et al. (2023) realized that while the debt ratio has a positive impact on ROA, ROE, and Tobin's Q, the short- and long-term debt ratios have the reverse effect. Anh-Huyen Vu Thi et al. (2021) assert that a company's financial performance metrics, including return on equity and return on assets, are significantly impacted by its capital structure. Zhuang Yan (2011) however, found a negative association between the corporate performance of SMEs and their capital structure. Accordingly, the following hypothesis can be developed:

H1: A SME's short-term debt ratio is positively related to ROA, ROE and Tobin's Q ratios.

H2: A SME's long-term debt ratio is positively related to ROA, ROE and Tobin's Q ratios.

The performance of SMEs is also impacted by corporate governance policies in numerous ways. The study conducted in 2022 by Mohamed Moustafa Soliman and Fady Nabeel Ismaeel concentrated on the audit committee presence, CEO duality, board size, used an empirical analysis to examine how corporate governance elements affected the performance of SMEs listed on Egypt's Nilex stock exchange. The study indicated that there is negligible association between Egyptian firm performance and the number of executive directors on the board. In contrast, however, F. Ganda (2022) revealed that the board independence ratio is considerably associated positively to all performance metrics in both the short-run and long-run periods. Almoneef, D. (2019) also demonstrate the positive relationship between board size and ROE. However, the analysis conducted shows that board diversity does not impact firm results, either positively or negatively. According to Roffia, P., et al. (2021), the ROA ratio—which is used as a proxy for financial performance—is influenced by the board of directors members' appropriate competencies and skills, the existence of committees or individual delegates within the board of directors, the provision of adequate and timely documentation prior to board meetings, the monitoring of board members' conflicts of interest, the board of directors' risk analysis and management, the performance-based remuneration of board members, and disclosure to stakeholders. The above-mentioned contradicting results might suggest the following hypotheses:

H3: A firm's independence board is positively related to firm performance ratios

H4: The board size is positively related to firm Performance.

The audit committee's existence is a crucial component of corporate governance. SMEs' performance was found to be impacted by the audit committee's size, according to Decipta Eka Swastya et al. (2023). Moreover, Okofo-Darteh, D., & Asamoah, E.S. (2020) also found that board leadership, the presence of an audit committee, and board size adequacy do not significantly influence SMEs' performance. Also, S. Supriyanto, J. Hendri (2021) found that executive directors, independent directors, female directors, audit committee meetings, and institutional investors had no significant effect on ROA or Tobin's Q. Thus, it is possible to formulate the following hypothesis:

H5: A firm's Audit Committee is positively related to firm performance ratios.

One corporate governance parameter that has a major impact on the performance of SMEs is the CEO duality. Tsagem, M.M., et al. (2019) claim that there is a negative correlation between the performance of SMEs on the one hand and CEO duality and women on board on the other. Additionally, they found a positive association between the performance of SMEs and family ownership and CEO tenure. Iskandar, T.M., et al. (2017) state that the non-executive board and CEO duality and the performance of SMEs are strongly and positively associated. Mohamed Moustafa Soliman and Fady Nabeel Ismaeel (2022) have found a strong correlation between CEO duality and SMEs' performance. Li, S., et al. (2021) claim that, in small enterprises as opposed to large businesses,

the chairman's function as CEO greatly increases company performance. As a result, the following hypothesis can be developed:

H6: A firm's CEO duality is negatively related to firm performance ratios.

Not too many studies that investigate corporate governance as a moderating factor between the capital structure and SMEs' performance. For instance, Ekawati, N., et al. (2021) found that the relationship between risk management and the financial performance of the banking sector is not moderated by corporate governance. Yet, research by Hudzaifah, I., Erlina, & Gultom, P. (2024) demonstrates that sound corporate governance can reduce the impact of capital structure and company size on financial performance, but it cannot reduce the impact of liquidity on financial performance. Financial performance is positively impacted by capital structure financing decisions, according to Ngatno, Apriatni, E.P., & Youlianto, A. (2021). This, however, is limited to short-term. Otherwise, return on equity and return on assets are negatively and negligibly impacted by long-term debt. The moderation study's findings indicate that while board size and ownership concentration are unable to moderate the relationship between capital structure and company performance, the size of the board of directors is the only factor that can strengthen it. Similar findings were reported by Bhatia, A., & Kumari, P. (2024), who found that the relationship between leverage and performance of Indian SMEs is considerably and favorably moderated by family ownership, board size, and board independence. The research indicates that the capital structure moderates the relationship between corporate governance and the performance of SMEs. For instance, Mansour, M., et al. (2022) examined whether capital structure (CS) has a contingent effect on the relationship between the firm's performance and the quality of its corporate governance (CG). According to the empirical findings, Jordanian non-financial companies listed on the Amman Stock Exchange (ASE) exhibit improved and more favorable performance between 2014 and 2019 because of higher CG quality. Additionally, the moderate effect of the CS reinforces this relationship. Considering this, the final two hypotheses are as follows:

H7: A board size moderates the relationship of capital structure and SME performance.

H8: The number of board meetings moderates the relationship between capital structure and SME performance.

Methodology

Variable and Data

23 SMEs listed on the NILEX stock exchange were included in the study as of December 2022. The variables and data gathered to evaluate the previously mentioned hypotheses are shown in Table (3).

Model

The study employs panel data analysis for 23 cross-sectional SMEs from 2017 to 2022. ROA, ROE and Tobin' Q represent the performance metrics of SMEs. So, the following two models are conducted:

$$\text{SME Performance}_{it} = Ci + \beta 1.\ \text{Short-term debt to Equity}_{it} + \beta 2.\ \text{board Size}_{it} + \beta 3.\ \text{N. board Meetings}_{it} + \beta 4\ \text{board Composition}_{it} + \beta 5\ .\ \text{If Audit Committee}_{it} + \beta 6\ .\ \text{CEO Duality}_{it} + \beta 7.\ \text{Interaction1}_{it} + \beta 8.\ \text{Interaction2}_{it}\ \beta 9.\ \text{Interaction3}_{it} + \beta 10.\ \text{Interaction3it}\ \beta 9.\ \beta 11.\ \text{Interaction4}_{it} + \beta 12.\ \text{Interaction5}_{it} + \beta 13.\ \text{Firm Size}_{it} \quad \ldots\ldots(1)$$

$$\text{SME Performance}_{it} = Ci + \beta 1.\ \text{Long-term debt to Equity}_{it} + \beta 2.\ \text{board Size}_{it} + \beta 3.\ \text{N. board Meetings}_{it} + \beta 4\ \text{board Composition}_{it} + \beta 5\ .\ \text{If Audit Committee}_{it} + \beta 6\ .\ \text{CEO Duality}_{it} + \beta 7.\ \text{Interaction1}_{it} + \beta 8.\ \text{Interaction2}_{it}\ \beta 9.\ \text{Interaction3}_{it} + \beta 10.\ \text{Interaction3it}\ \beta 9.\ \beta 11.\ \text{Interaction4}_{it} + \beta 12.\ \text{Interaction5}_{it} + \beta 13.\ \text{Firm Size}_{it} \quad \ldots\ldots(2)$$

Where: SME Performance can be ROA, ROE and Tobin's Q. Capital Structure variable is short-term debt ratio in the first model and long-term debt ratio in the second one. Corporate governance variables include board size, number of board meetings, and three dummy variables represent board composition, the presence of audit committee and CEO duality. The moderation effects of governance on capital structure consist of following interaction terms:

Moderation 1 = (short or long-term debt ratio × board size)

Moderation 2 = (short or long-term debt ratio × N. board meetings)

Moderation 3 = (short or long-term debt ratio × board composition)

Moderation 4 = (short or long-term debt ratio × audit committee)

Moderation 5 = (short or long-term debt ratio × CEO Duality)

The cross-sectional unit of the study is indexed by the subscript (i) that represents one of the 23 SMEs covered by the study and the subscript (t) represents the time dimension that represent years covered from 2017 to 2022. Interactions 1 and 2 indicate moderating variables. To investigate whether there are differences in the connection between a dependent variable and one independent variable at different values of another independent variable. Using interaction terms as moderation in regression analysis makes it possible to examine whether the value of one predictor affects the outcome variable differently than another. In other words, the independent variable (IV) is assumed to have an impact on the dependent variable (DV). A moderator is a third variable that influences the magnitude and/or direction of the interaction between the IV and DV.

Descriptive Statistics of Variables

Financial Status Statistics of Egyptian SMEs

Table (4) presents the summary statistics of the financial status of the SMEs in Egypt during the period of the study. The average current assets of the 132 Observations are 38.71 million Egyptian pounds. The range of current assets is between LE 0.07million and LE 369.40 million, whereas the range of fixed assets is between LE 0.40 million and LE 145.95 million, with an average of LE 15.67 million. The range of total assets is between LE 3.53 million and LE 369.90 million, with an average of LE 54.38 million. Current assets represent 71% of the total assets. The ratio of current assets to fixed assets is 2.5:1, which corresponds to the nature of SME operations.

Table (3): Variables and Data of the Study

Variable	Measurement	Source
Capital Structure Variable		
Short-term debt ratio	Short-term debt / Total Assets	Financial statements of the SME
Long-term debt ratio	Long-term debt / Total Assets	Financial statements of the SME
Corporate Governance Variables		
Independent board	Number of independent board of directors who are not employed by the company and has no financial interest in it.	Complementary governance reports to the financial statements of the SMEs.
Board Size	Number of board of directors including dependent and independent directors.	Complementary governance reports to the financial statements of the SMEs.

Number of board Meetings	Number of board of directors' meetings during the year.	Complementary reports to the financial statements of the SMEs.
board Composition	Dummy variable takes 1 if number of independent board members > number of independent board members, and 0 otherwise	Complementary governance reports to the financial statements of the SMEs.
Audit committee	Dummy variable takes 1 if there is an audit committee and 0 otherwise.	Complementary reports to the financial statements of the SMEs.
CEO Duality	Dummy variable takes 1 if the CEO of the firm is a member of board of directors and 0 if not.	Complementary reports to the financial statements of the SMEs.
SME's Performance		
ROA (Return on Assets)	Net income/Average total assets	Financial statements of the SME
ROE (Return on Equity)	Net income/Average shareholder's equity	Financial statements of the SME.
Tobin's Q Ratio	The ratio of market value of the firm to its book value: Market Value = number of outstanding shares × stock price at the beginning of the year Book value = the value of total assets	NILEX indicators report and the financial statements of SMEs
Control Variable		
Firm size	The natural logarithm of total asset of the firm.	Financial statements of the SME.

The range of total equity is between LE 0.41 million and LE 369.90 million, with a mean of LE 20.93 million. Short-term debt averages 15.95 between zero and 352.41 million Egyptian pounds. Long-term debt ranges between zero and LE 95.34 million. This indicates that short-term debt is the primary source of financing for SME operations. It could be because short-term sources are more accessible than long-term sources, even though short-term sources are more expensive. The typical range of total debt (short-term and long-term) is between zero and LE 352.41 million with average of 17.64 million. In summary, Egyptian small and medium-sized enterprises rely primarily on short-term debt and less on long-term debt or equity financing to operate. Short term debt represents 90% of total debt on average.

Table (4): Summary Statistics of SMEs' Financial Status

Variable	Obs.	Mean	Std. Dev.	Min	Max
Current Assets	132	38.71	66.373	.07	368.398
Fixed Assets	132	15.667	22.123	.4	145.952
Total Asset	132	54.378	75.353	3.534	369.898
Total Equity	132	21.928	22.765	.408	160.095
Short Term Debt	132	15.953	46.682	0	352.411
Long Term Debt	132	1.682	8.917	0	95.336
Total Debt	132	17.635	47.244	0	352.415

Financial Performance Statistics of SMEs

The financial performance indicators are presented in Table (5). The average ROA for SME is 0.56%, ranging from -55.25% to 88.54%. In contrast, the return on equity of small and medium-sized enterprises ranges between -509.82% and 65.24% with an average of - 4.20%. Tobin-Q ranges from -11.26 to 20.80 and averages 2.03. fluctuations of ROE is more than their counterparts of ROA and Tobin's Q as indicated by higher standard deviation.

Table (5): Summary Statistics of SMEs' Capital Structure and Firm Performance Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Return on assets [ROA]	132	.558	13.173	-55.251	88.854
Return on equity [ROE]	132	-4.198	53.633	-509.818	65.235
Tobin's Q	132	2.028	2.79	-11.258	20.791

Capital Structure Statistics of SMEs

Table (6) shows the statistics of capital structure variables. Short-term debt ratio (short-term debt to total assets) averages 18.67 and ranges between zero and 102.94% whereas the long-term debt ratio (long-term debt to total assets) averages only 4.11% and ranges between zero and 92.68%. Total debt to total assets ratio averages 22.78% and ranges from zero to 105.64%. On average, short-term debt represents 82%.

Table (6): Summary Statistics of SMEs' Capital Structure

Variable	Obs.	Mean	Std. Dev.	Min	Max
Short term debt ratio	132	18.667	25.603	0	102.935
Long term debt ratio	132	4.112	13.438	0	92.679
Total debt ratio	132	22.78	28.281	0	105.643

Corporate Governance Statistics of SMEs

The summary statistics of SME corporate governance indicators are presented in Table (7). The average size of a board of directors is six members, with four independent and two dependent members. The number of independent board members ranges from 0 to 7, while the number of dependent board members ranges from 1 to 5. The total board size ranges from 3 to 9 directors.

Table (7): Summary Statistics of SMEs' Corporate Governance Indicators

Variable	Obs.	Mean	Std. Dev.	Min	Max
Board Size	132	5.561	1.28	3	9
Independent Board	132	3.659	1.547	0	7
Dependent Board	132	1.902	1.062	1	5
Board Meetings	131	5.985	2.13	3	14
Audit Committee Size	132	.795	1.407	0	5
Number Audit Committee Meet	132	1.076	2.025	0	10
Board Composition	132	.75	.435	0	1
Audit Committee	132	.25	.435	0	1
CEO Duality	132	.432	.497	0	1

Table (7) indicates that the number of independent members exceeded the number of dependent members in 65% of instances during the study period. Even though the law does not require SME to have an audit committee, 25% of SME examined in the study had one. Also, in 43% of situations, the

chief executive is a member of the board of directors. Audit committee size ranges from zero to 5 members and they meet 1 time on average.

Coefficient of Correlation Analysis

Table (8) below displays the coefficient of correlation between the study's independent variables. Table (8) demonstrates that there is a weak or poor correlation between all variables. This indicates the absence of a linear relationship between these variables.

Accordingly, there is not a definitive conclusion about the relationship between these variables based solely on correlation analysis. The poor correlations indicate the absence of multicollinearity between independent variables. This result motivates conducting more precise statistical analysis techniques. Consequently, the subsequent sections detail the panel data analysis.

Table (8): Coefficients of Correlations between Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Capital Structure	1.00								
(2) Board Size	0.09	1.00							
(3) Board Meetings	0.15	0.28	1.00						
(4) Audit Committee Size	0.14	0.20	0.01	1.00					
(5) N. Audit Committee Meets	0.12	0.19	-0.01	0.90	1.00				
(6) Board Composition	0.15	0.25	0.01	0.21	0.21	1.00			
(7) Audit Committee	0.15	0.19	0.02	0.98	0.92	0.22	1.00		
(8) CEO Duality	0.14	-0.11	0.01	-0.22	-0.17	0.22	-0.22	1.00	
(9) Firm Size	0.23	0.13	0.46	0.01	-0.03	-0.05	0.01	-0.02	1.00

The Results of Panel Data analysis

Table (9) below represents the results of the panel data analysis. The table contains 3 different sections related to ROA, ROE and Tobin's Q, respectively.

The Effect of Short-term debt and Corporate Governance on The SME Performance Measured by ROA

The panel data regression analysis of ROA is represented by the Model (1) outcomes in table (9). The short-term debt to equity ratio is insignificant. This result suggests that the short-term debt ratio has no effect on the return on assets (ROA) of SMEs. The presence of an audit committee, however, is the only corporate governance metric that matters. SMEs in Egypt are not obliged to establish an audit committee, although having one can boost return on assets (ROA) by 7.76% compared to not having one.

A short-term debt-ratio plays a moderating role in the link between the existence of audit committee and ROA. Moreover, the total marginal effect of the existence of audit committee can be represented as follows:

$$\partial \text{ ROA} / \partial \text{ Audit Committee} = 7.76 - 0.25 \text{ Short-term debt} \quad (3)$$

According to equation (3), a 1% rise in short-term debt might result in a 0.25% decrease in the audit committee's impact on ROA.

B. The Effect of Short-term debt and Corporate Governance on The SME Performance Measured by ROE

The results of the panel data regression of ROE are likewise displayed in model (3) of table (9). The entire marginal impact of short-term debt on ROE, as per Model (2), can be stated as follows:

$$\partial \text{ ROE} / \partial \text{ short-term debt} = 1.82 - 0.30 \text{ Board Size} - 1.98 \text{ Audit Committee} - 1.25 \text{ CEO Duality} \quad (4)$$

Equation (4) indicates that a 1% increase in short-term debt is linked to a 1.82% increase in ROE. Corporate governance indices, however, this impact is moderated by corporate governance indices. For example, adding one member to the board of directors lowers the impact of short-term debt on ROE by 0.30%. The effect of short-term debt on ROE is similarly mitigated by the existence of audit committee and CEO duality, which decrease it by 1.98% and 1.25%, respectively.

ROE appears to be greatly impacted by the audit committee as well. The ROE of SMEs might rise by 34.39% when an audit committee is present compared to when one is not. Although SMEs are not required by law to establish an audit committee, this research emphasizes the significance of doing so to oversee the interests of shareholders.

Table (9): Panel Data Regression Analysis of SMEs' Performance on Short Term Debt†

Independent Variables	**ROA**	**ROE**	**Tobin's Q**
Dependent Variables	Model (1)	Model (2)	Model (3)
Short term debt ratio	-.183	1.817**	.107**
	(-.791)	(2.164)	(2.075)
Board Size	-1.327	-.702	.387
	(-.991)	(-.153)	(1.407)
Moderation-1	.018	-.303**	-.006
	(.467)	(-2.139)	(-.723)
Board Meetings	.363	1.079	-.019
	(.475)	(.398)	(-.112)
Moderation-2	.004	.031	-.003
	(.165)	(.345)	(-.561)
Board Composition	2.313	-2.683	1.072
	(.616)	(-.207)	(1.374)
Moderation-3	.173	.691	-.049*
	(1.433)	(1.569)	(-1.812)
Audit Committee	7.764**	34.388***	.624
	(2.142)	(2.701)	(.807)
Moderation-4	-.254***	-1.983***	-.031
	(-2.653)	(-5.762)	(-1.474)
CEO Duality	1.297	14.327	-1.068
	(.41)	(1.294)	(-1.591)
Moderation-5	-.11	-1.247***	-.016
	(-1.225)	(-3.85)	(-.818)
Firm Size	3.966***	15.929***	-.194
	(2.582)	(3.276)	(-.682)
_cons	-10.691	-64.226**	.314
	(-1.195)	(-2.154)	(.177)
Observations	131	131	131
Hausman Chi-square	0.20	.07	.32
Within R^2	.178	.37	.13
t-values are in parentheses			
*** p<.01, ** p<.05, * p<.1*			
† Hausman chi-square > 0.05 indicating that random effect model is more appropriate than fixed effect.			

C. The Effect of Short-term debt and corporate Governance on The Firm Performance Measured by Tobin's Q

The findings of Tobin's Q panel data regression are shown in Table (9) as Model (3). Tobin's Q of the SME appears to be significantly impacted by the short-term debt ratio. A 1% increase in short-term debt is associated with a 0.11% increase in Tobin's Q. Neither the governance indices nor the interaction terms appear to be significant at the 0.05 significance level. This could mean that the market of SMEs is not impacted by governance measurements.

Generally, the panel data results shown in table (9) can be summarized as follows: Short-term debt is a determinant to SMEs' ROE and Tobin-Q but ROA. Audit committee is also determinant to SMEs' ROA and ROE and plays as moderating role in the link between short-term debt ratio and these performance indicators. Firm size is positively affecting ROA and ROE of SMEs but Tobin's Q.

D. The Effect of Long-Term Debt on SMEs' Performance

On the other hand, the long-term debt is not influencing SME's performance that much compared to short term debt does. Table (10) shows the panel data regression analysis of long-term debt on SME's ROA, ROE and Tobin's Q.

The results of table (9) show that, although long-term debt does not influence any of the performance metrics for SMEs' performance, CEO duality does have a moderating effect on ROE and Tobin's Q, and board composition only moderates Tobin's Q.

Tables (9) and (10) present the findings, which demonstrate that short-term debt has a positive effect on SME performance whereas long-term debt may not have a significant effect. These findings are in line with Benkraiem, R., et al. (2022) who offer strong proof that short-term debt can significantly and positively affect small and medium-sized businesses' performance. Numerous variables contribute to this beneficial effect. First of all, SMEs may manage cash flows, finance ongoing operations, and seize expansion possibilities by utilizing short-term loans as a useful source of working capital. Short-term finance can give SMEs the financial liquidity they need to adapt to shifting market conditions and seize new business opportunities.

Furthermore, when compared to long-term debt financing, SMEs may find it easier to get short-term finance. Since short-term debt usually involves lower amounts and shorter repayment terms, lenders may view it as less hazardous. As a result, small and medium-sized enterprises (SMEs) would have easier

Table (10): Panel Data Regression Analysis of SMEs' Performance on Long Term Debt†

	ROA	**ROE**	**Tobin's Q**
	Model (4)	Model (5)	Model (6)
long term debt ratio	-.765	-2.05	.212
	(-.866)	(-.57)	(1.215)
Board Size	-2.051	-11.547*	.13
	(-1.365)	(-1.89)	(.438)
Moderation-1	.066	.109	-.013
	(.703)	(.284)	(-.723)
Board Meetings	-.941	-4.258	.211
	(-1.222)	(-1.359)	(1.391)
Moderation-2	.013	-.256	-.016
	(.121)	(-.577)	(-.748)
Board Composition	4.108	-16.696	-1.831*
	(.859)	(-.858)	(-1.943)

Moderation-3	.076	-4.315*	.564***
	(.142)	(-1.977)	(5.336)
Audit Committee	6.317	8.179	.735
	(1.396)	(.444)	(.824)
Moderation-4	-.014	-.777	-.006
	(-.057)	(-.76)	(-.129)
CEO Duality	3.242	-1.955	-.159
	(.839)	(-.124)	(-.209)
Moderation-5	.271	7.038***	-.602***
	(.561)	(3.588)	(-6.331)
Firm Size	13.243***	38.381***	.095
	(3.777)	(2.691)	(.137)
_cons	-32.226**	-25.857	.639
	(-2.54)	(-.501)	(.255)
Observations	131	131	131
Hausman Chi-square	.000	.000	.020
Within R^2	.187	.273	.393
t-values are in parentheses			
*** p<.01, ** p<.05, * p<.1*			
† *Hausman Prob* ≤ 0.05 *significance level indicates fixed-effect model is more appropriate than random-effect model.*			

access to short-term loan facilities. These could help them with their operational needs and enhance performance indicators like return on equity and return on assets (Tran, H. T., & Nguyen, T. T., 2021).

On the other hand, the impact of long-term debt on the performance of SMEs is not well supported by data. According to some studies, long-term debt may negatively impact the performance of SMEs, but other research indicates that it has no appreciable impact (Akingunola, R. O., et al., 2021). Long-term debt obligations could be detrimental since they raise the risk of default and reduce the flexibility of operations. For SMEs, repaying long-term debt can be challenging, particularly during recessions or periods of reduced cash flow. Their entire financial performance may suffer as a result (Kara, E., & Tan, M. T., 2021).

However, SMEs must balance long-term and short-term debt funding appropriately. Although short-term debt might be advantageous in the short term, an over-reliance on it can lead to increased risks associated with liquidity and financial restrictions over time. In order to choose the best debt structure that meets their operational demands and promotes long-term financial performance, SMEs should carefully consider their financing requirements, growth goals, and risk profiles.

Post-Estimate Robustness Tests

To ensure estimates are not affected by multicollinearity (independent variable is highly correlated with one or more of the other independent variables in a multiple regression equation), the researcher variance inflator factor analysis (VIF) is performed. Tolerance and VIF and used to check if there are any linear combination between the in- dependent variables of the model. Table (11) demonstrates that there is no multicollinearity issue with independent variables, as the VIF is less than 2 for each of them (Kennedy 2008).

To ensure that the best linear unbiased estimates (BLUE) are obtained in table (11), the researcher employed robust estimate to account for heteroskedasticity (the variance of the residuals is unequal across a range of measured values) and serial correlation (the regression residuals are correlated with each other) in all panel data regression analysis shown in table (9).

Table (11): Multicollinearity test: Variance Inflator Factor

	VIF	1/VIF
Capital structure	1.686	.593
Board size	1.216	.823
N. board meetings	1.042	.959
Board composition	1.257	.795
Presence of audit committee	1.218	.821
CEO duality	1.179	.848
Firm size	1.324	.756
Mean VIF	1.254	

In addition, the researcher performed a [linktest] for each regression to ensure that the linearity of the model was maintained and to check for misspecification issues with the model estimates. The linktest requires predicting the value of y-hat and y-hat square in addition to performing a regression. The analysis specifications are valid if y-hat is significant, but y-hat square is not (White, 1982). Table (12) indicates that y-hat is significant, but y-hat square is not, then the analysis does not contain any misspecification. Based on post-estimation testing, the researcher can assert that all regression analyses conducted in this chapter are valid and reliable. This analysis can therefore be utilized to test research hypotheses and derive policy implications

Table (12): Misspecification T-test (linktest)

	Coefficient	Std. err.	z	P > z	[95% conf. interval]	
yhat	1.00	0.17	6.00	0.00	0.68	1.33
yhatsq	0.15	1.03	0.15	0.88	-1.87	2.18
_cons	0.00	0.03	-0.07	0.94	-0.05	0.05

Hypotheses Testing

This part of the paper focuses on how much the hypotheses are confirmed or refuted after using panel data regressions analysis to evaluate the influence of capital structure and corporate governance variables on SME performance. The hypotheses and the choice to accept or reject them based on the data found from the regression analysis given in table (9) and table (10) are shown in table (13) below.

Table (13): Hypothesis Testing Results

H1a	**A firm's short-term debt is positively related to ROA ratios.**	**Rejected**	**Model (1): short-term debt is insignificant.**
H1b	A firm's short-term debt is positively related to ROE ratios.	Accepted	Model (2): short-term debt is significant and positively related to ROE.
H1c	A firm's short-term debt is positively related to Tobin Q ratios.	Accepted	Model (3): short-term debt is significant and positively related to Tobin-Q.
H2	A SME's long-term debt ratio is positively related to ROA, ROE and Tobin's Q ratios.	Rejected	Models (4, 5 & 6): long term debt is insignificant
H3	A firm's independence board is positively related to firm performance ratios.	Mixed	board composition appeared insignificant in all regression estimates but in model (6)

H4	A firm's Audit Committee is positively related to firm performance ratios.	Mixed	The Audit committee is significant only to ROA and ROE.
H5	A firm's CEO duality is negatively related to firm performance ratios.	Mixed	Insignificant in all models but in model (5) and model (6).
H6	A board size is positively related to firm Performance.	Rejected	Insignificant in all models
H7	A board size is moderating the relationship of capital structure and SME performance.	Mixed	Moderating effect shown only for ROE.
H8	A number of board meetings is moderating the relationship of capital structure and SME performance.	Rejected	Insignificant in all models

CONCLUSIONS AND POLICY IMPLICATIONS

This study examines the quantitative relationship between the capital structure as determined by short-term debt ratio and corporate governance characteristics, and the performance of SMEs as indicated by return on assets (ROA), return on equity (ROE), and Tobin-Q. The descriptive statistics show that short-term debt is the main source of funding for SMEs in Egypt.

The panel data analysis results, which were utilized to estimate the impact of short-term debt on SME's performance, indicate that ROE and Tobin-Q performance of SMEs are influenced by short-term debt, but not ROA. Board size is not determinant Tobin's Q, ROA, or ROE. On the other hand, the relationship between short-term debt and ROE is moderated by the size of the board. Moreover, it appears that having an audit committee is crucial for increasing ROA and ROE, either directly or indirectly. On the other hand, the impact of long-term debt on the performance of SMEs is not well supported by data.

Post-estimation considerations indicate that the estimated panel data results are BLUE and free of misspecification, multicollinearity, heteroscedasticity, and serial correlation.

Finally, the testing of hypotheses is conducted to determine the extent to which each hypothesis is accepted or rejected.

The relationship between capital structure, corporate governance, and the performance of small and medium-sized enterprises (SMEs) in Egypt has significant policy implications. Here are some key policy implications:

Finance accessibility: Information asymmetry, a lack of collateral, and the perception of increased risk are common obstacles that SMEs must overcome to obtain financing. In addition to helping SMEs optimize their capital structure, policies targeted at enhancing their access to a variety of funding sources—including bank loans, venture capital, and crowdsourcing—can also boost their expansion and success.

Encouraging strong corporate governance: Robust corporate governance tools, like functional board structures, accountability, and transparency, can improve the performance and reputation of SMEs. The performance of SMEs can be enhanced by policies that support best practices in corporate governance, offer resources and training, and offer incentives for SMEs to implement these practices.

Regulatory framework: The decisions made by SMEs regarding their capital structure and governance are greatly influenced by the regulatory environment. Policies that achieve a balance between avoiding undue compliance burdens and offering a supportive regulatory framework can assist SMEs in making well-informed decisions about capital structure and governance that are consistent with their growth goals.

Investor protection: Encouraging legislation and effective enforcement strategies can boost investor trust and make it easier for SMEs to obtain outside funding. Policies that protect the interests of investors—including minority shareholders—can help SMEs have more favorable governance and capital structures.

Tax incentives and subsidies: To encourage SMEs to adopt capital structures or corporate governance procedures that are judged advantageous for their performance and growth, policymakers may want to consider providing tax incentives or subsidies. These incentives may affect the finance and governance choices made by SMEs.

Education and capacity-building: SME owners and managers can improve their knowledge and abilities in managing capital structure, corporate governance, and overall business performance with the support of policies that facilitate capacity-building efforts, such as training programs and consulting services.

Research and development: Encouraging data collection and research on the interactions among capital structure, corporate governance, and SME performance can help shape evidence-based policymaking and offer insights for customizing regulations to the unique requirements and traits of SMEs across various industries and geographical areas.

Generally, in order to assist SMEs' growth and long-term performance, authorities should use a comprehensive strategy that takes into account the different elements influencing SMEs' capital structure and corporate governance decisions.

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