

The Relationship between Financial Structure and Accounting Performance: A Benchmark Study of a Sample of Companies Listed on the Algiers Stock Exchange during the Period 2017–2024

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SUMMARY

This study aimed to examine the impact of financial structure—measured by the equity ratio, the debt-to-equity ratio, and the long-term assets ratio—on accounting performance measured by the return on assets. The study relied on (panel data) comprising 40 observations obtained from the financial statements of a sample of five (05) companies listed on the Algerian stock market over an eight (08)-year period from 2017 to 2024. To analyze the data and test the study's hypotheses, the study relied on descriptive and inferential statistical analysis methods using Eviews 14.SV software. The results showed that the equity ratio, the debt-to-equity ratio, and the long-term assets ratio have a statistically significant inverse relationship with accounting performance, as measured by the return on assets. In light of these results, the study recommends that the companies under study adopt a specific policy to maintain a balanced financial structure.

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1. INTRODUCTION

The financial structure, or capital structure, refers to how a company finances its assets and operations through debt, equity, or a combination of both. The financial structure is one of the most important strategic decisions in an organisation because it is linked to its fundamental purpose: maximising its value to ensure its survival and continuity (Priyanka & Singh, 2022). Financial performance is also considered one of the most important indicators of a company's success, as it reflects its ability to generate profits and financial returns and to utilise its resources efficiently. Capital structure decisions affect a company's ability to finance growth and its efficiency in dealing with economic uncertainty (Gautam et al., 2025).

The theoretical framework for financial structure and financial performance is based on the idea that financing decisions are central to corporate finance; firms must choose how to finance their operations and growth through debt, equity, and related instruments, making financial structure both a financing choice and a risk choice for the firm (Oluwaleye et al., 2021).

The theoretical importance of this topic lies in the fact that financing decisions are typically made to maximize wealth; thus, the quality of a company's financing choices is often evaluated based on their impact on the company's value and financial performance. Consequently, many studies use concepts such as profitability, revenue generation, and optimal asset utilization to assess performance and determine whether the chosen financing mix benefits or harms the company (Gharaibeh & Sarea, 2015).

Numerous researchers have conducted studies on this topic in both developed and developing countries, such as Algeria, to determine the relationship or impact between financial structure and financial performance, using various samples and time periods and applying multiple statistical methods. Given the varied and conflicting results of these studies, this research aims to shed light on this aspect by conducting a benchmark study on a sample of companies listed on the Algerian Stock Exchange from 2017 to 2024. Accordingly, the research question was formulated as follows:

To what extent does financial structure affect the financial performance of companies listed on the Algerian Stock Exchange during the period 2017–2024?

2. THEORETICAL FRAMEWORK AND PREVIOUS STUDIES

2.1. Financial Structure

2.1.1. The Concept of Financial Structure

Numerous definitions have emerged due to differing opinions among authors and researchers in financial management regarding the concept of “financial structure”. [Fabozzi and Peterson Drake \(2009\)](#) define it as the process of combining debt and equity to finance a company’s projects; In other words, it encompasses all sources of long-term and short-term financing, which are known in accounting as liabilities on the balance sheet—representing the total obligations incurred by the company in exchange for its total assets.

[Moyer et al. \(2006\)](#) also defined it as how a company finances its assets using all available resources. Generally, companies finance only a portion of their assets with equity capital (common stock, preferred stock, retained earnings, and reserves). In contrast, the remainder is financed by debt and other short-term liabilities.

[Ali et al. \(2015\)](#) identified five important factors that determine a company’s optimal capital structure: cost, risk, control, flexibility, and timing. The financial planning process is one of the key aspects in shaping the capital structure; it determines whether these needs will be met from internal resources or through external financing sources, such as long- or short-term debt, the issuance of preferred or common stock, or other sources of financing.

2.1.2. Theories of Capital Structure

Capital structure is one of the most controversial issues in business; consequently, various theories have been proposed to explain it. Some theories acknowledge the existence of an optimal capital structure, while others reject this notion. Among the most important of these theories are:

2.1.2.1. The Traditional Theory

The traditional theory is based on the premise that there is a relationship between a company’s capital structure and its value. In other words, the way a firm finances its operations through debt and equity affects its total value. This theory advocates the rational use of debt to increase the firm’s value on the one hand and minimise the risks resulting from increased debt on the other. Therefore, corporate decision-makers must consider how to balance capital structure, firm value, and dividend policy ([Lumby & Jones, 2015](#)).

2.1.2.2. Modigliani and Miller’s Theory

In 1958, [Modigliani and Miller](#) published their theory, known as the “irrelevance of capital structure” theory. This theory is based on a set of assumptions: that all internal and external parties to the company have access to the same information (information symmetry); that the cost of debt equals the cost of equity; and that the company’s earnings before interest and taxes (EBIT) are not affected by the method of debt financing. In other words, increasing debt in the capital structure will lead to a decrease in the weighted average cost of capital (WACC) due to the lower cost of borrowing; and as equity increases, that increase will be exactly equal to the extent to which the lower cost of borrowing is offset, thereby keeping the WACC constant.

Following numerous criticisms of the theory, [Modigliani and Miller](#) announced a modification to their previous hypothesis in 1963, in which the two scholars took tax benefits into account as determinants of the financial structure; since increased leverage allows a company to enhance its value and performance thanks to the tax deductibility of interest payments ([Lawal et al., 2014](#)).

2.1.2.3. Equilibrium Theory

In 1984, Myers and Majluf addressed this theory, which advocates prioritising a company's own resources (internal financing) when funding new projects; if retained earnings are insufficient for financing, borrowing (such as issuing bonds) is preferred to issuing new equity shares. According to this theory, the cost of capital structure is a key factor, with priority given to internal sources of financing, followed by the lowest-cost financing (debt), while issuing new common stock is the last resort due to its high cost (Muritala, 2012).

2.2. Financial Performance

Financial performance is considered one of the most important indicators used to measure a company's success, as it reflects its ability to generate profits and financial returns and to utilize its resources efficiently; it serves as a mirror that reflects the company's activities and achievements. Financial performance also represents the narrow concept of corporate performance, as it focuses on using financial indicators to measure the extent to which objectives are achieved. It serves as the primary driver of the various business activities carried out by the company and contributes to making financial resources available and providing the company with investment opportunities in different areas of performance, which help meet the needs of stakeholders and achieve their objectives (Kim et al., 2021); Consequently, it reflects the company's financial position over a specific period, including the raising and use of funds—aspects that can be measured through various indicators such as return on assets, return on equity, capital adequacy ratio, and solvency ratio (Van Horne & Wachowicz, 2008).

Based on the above definitions, we conclude that financial performance is a tool used to assess and understand a company's financial condition over a specific period of time—that is, to determine its efficiency in utilising available resources, on the one hand, and the extent to which it achieves its objectives, on the other.

2.3. Review of Previous Studies

Previous studies serve as the scientific foundation upon which the researcher relies to enrich the study and distinguish it from prior research; the researchers reviewed numerous studies relevant to the topic, which will be presented in chronological order from oldest to most recent:

- ✓ **Study (Vo & Ellis, 2017):** This study examined the relationship between capital structure and shareholder value in Vietnam, using accounting data from companies listed on the Ho Chi Minh City Stock Exchange during the period 2007–2013. It reached a number of conclusions, the most notable of which was the existence of an inverse relationship between leverage and shareholder value, indicating that the cost of debt financing exceeds the expected return for Vietnamese companies.
- ✓ **Study (Le & Phan, 2017):** This study used unbalanced cross-sectional data for all non-financial listed companies during the period 2007–2012 to examine the impact of capital structure on corporate performance in Vietnam. The results showed a strong negative relationship between all debt ratios and firm performance. This finding is inconsistent with most studies conducted in developed countries, which assume a positive relationship between capital structure and firm performance; however, it is consistent with some studies in the context of emerging markets.
- ✓ **Study (Siddik et al., 2017):** This study examined the impact of financial structure on the profitability of 22 banks in Bangladesh during the period (2005–2014) using panel data models, and the study reached a set of findings, the most important of which is that the ratios of domestic assets (SLA) and long-term domestic assets (LLA) have a significant negative effect on return on assets (ROA). Furthermore, the long-term local asset ratio (LLA) has a significant positive effect on return on equity (ROE), while the short-term local asset ratio (SLA) has a significant negative effect. Meanwhile, the control variables—size, growth rate, and inflation—have a positive effect on the dependent variables, whereas liquidity and real GDP growth have a negative effect.
- ✓ **Study (Nguyen & Nguyen, 2020):** This study aimed to investigate the variation in the impact of capital structure on performance between state-owned and non-state-owned firms listed on the Vietnamese stock market, and relied on panel data for a sample of 488 non-financial firms listed on the Vietnamese stock market over a six-year period (2013–2018). The results showed that capital structure has a statistically significant negative effect on firm performance, and also indicated that this effect is stronger in state-owned companies compared to non-state-owned companies in Vietnam.
- ✓ **Study (Dinh & Pham, 2020):** This study examines the impact of capital structure on the financial performance of pharmaceutical companies listed on the. Data was collected for the period from 2015 to 2019 for all 30 pharmaceutical companies listed on the Vietnamese stock market. A simple linear regression model was used to test the impact of capital structure on the companies' financial performance. The results of the analysis showed that the

leverage ratio, the ratio of long-term assets, and the debt-to-assets ratio are positively correlated with company performance, while equity financing has a negative effect on return on equity.

- ✓ **Study (Ngoc et al., 2021):** This study examined the impact of capital structure on the operating performance of 25 real estate companies listed on the Ho Chi Minh City Stock Exchange (HOSE) during the period from 2011 to 2018. The results showed that capital structure has a negative effect on operating performance. In addition, the study revealed that tangible assets (TANG) have a positive effect on the performance of real estate companies, a result that is consistent across the three regression models used using the applicable generalized least squares (FGLS) method; this suggests that as the tangible fixed assets of listed real estate companies increase, the efficiency of their operational performance improves. As for the control variables—which included firm size (SIZE), liquidity (LIQ), asset growth (GROWTH), economic growth (GDP), and the inflation rate (INF)—the study did not find sufficient evidence to conclude that there is a relationship between these variables and operational performance.
- ✓ **Study (Arhinful et al., 2023):** The study aimed to examine the impact of capital structures (represented by capitalization ratios and debt-to-EBITDA ratios —EBITDA—on the financial performance of Ghanaian financial institutions. The study selected 15 financial institutions in Ghana using a purposive sampling strategy; ten (10) of these institutions were listed on the Ghana Stock Exchange, while the remaining five (5) were unlisted. Data were collected from the audited annual reports of these institutions and analyzed using the “Stata” software in accordance with the fixed-effects and random-effects models. The Hausman test was also used to determine the most appropriate method for presenting the study’s results, and it was found that the random-effects model was the most suitable. The results showed that the capitalization ratio has a negative effect on the net interest margin, the loan-to-assets ratio, and the return on assets. With regard to the debt-to-EBITDA ratio, it was found to have a negative effect on the net interest margin and return on assets, while having a positive effect on the loan-to-assets ratio; it was also found that this ratio has a statistically significant effect on both the net interest margin and return on assets.
- ✓ **Study (Javaid et al., 2024):** This study aims to explore the impact of ownership structures on corporate performance and, consequently, on the country’s overall economic prosperity; for it is undeniable that well-performing commercial banks play a role in promoting economic growth. A company’s ownership structure is responsible for defining and distributing authority among management. Given that the relationship between ownership structure and the performance of commercial banks in Pakistan has not been studied previously, this study seeks to fill this gap by examining data from 20 banks listed on the Pakistan Stock Exchange during the period from 2010 to 2021, using a panel regression model with fixed effects. The results confirmed that ownership structure has a significant positive impact on performance. The study emphasizes the importance of prioritizing and achieving an optimal ownership structure to enable banks to achieve their strategic objectives and enhance their resilience, thereby ensuring their sustainability, through improved governance practices.

2.4. What Distinguishes the Current Study from Literature Review

A review of the existing literature reveals that the relationship between financial structure and accounting performance has received extensive research attention, both in developed economies and emerging markets. Furthermore, many studies have used data from listed companies and panel data models to analyze this relationship. Therefore, the research gap does not lie in the absence of previous studies on the subject, but rather in the limited number of studies that have examined this relationship in the context of companies listed on the Algiers Stock Exchange, particularly given the limited number of listed companies and the diversity of the sectors to which they belong.

Furthermore, a review of the literature reveals clear differences in the indicators used to measure financial structure, financial and accounting performance, and the standard models employed, as well as inconsistent results in previous studies regarding the direction of the relationship between financial leverage and performance indicators. Accordingly, the present study seeks to provide additional empirical evidence from the Algerian context, while clarifying the limits of the generalizability of the results given the characteristics and size of the sample.

3. RESEARCH METHODOLOGY

3.1. Study Design and Methodology

This study falls within the category of applied quantitative studies aimed at analyzing the relationship between the financing structure and the accounting performance of companies listed on the Algiers Stock Exchange during the period from 2017 to 2024. The study relied on a standard analytical approach, utilizing panel data, which allows for the simultaneous utilization of both the cross-sectional and time-series dimensions of the data.

It should be noted that the study does not treat all observations as statistically independent, since consecutive years for the same firm represent partially correlated observations. Consequently, the basic unit of analysis is the firm-year, rather than the firm as an independent observation in each instance. Furthermore, the results are interpreted within the context of the five firms included in the sample and are not generalized absolutely to all Algerian firms.

3.2. Study Population and Sample

The study population consists of companies listed on the Algiers Stock Exchange for which financial data were available during the study period. According to the data used in the study, the study population comprised eight (08) companies, three (03) of which (Mestashir, the Algerian People's Bank, and the Local Development Bank) were excluded due to their recent listing and the lack of a complete time series that would allow for the construction of a balanced data set for the period under study.

The following (Table 1) is an overview of the companies comprising the study sample:

Table 1

Companies Representing the Study Sample

ISIN Code	Stock Exchange Ticker	Company Name	Sector / Category	Nominal Value (DZD)	Number of Shares
DZ0000010037	ALL	Alliance Assurances	Insurance	380	13,930,826
DZ0000010029	AUR	EGH El Aurassi	Hospitality	250	6,000,000
DZ0000010003	SAI	Saidal	Pharmaceutical Industry	250	10,000,000
DZ0000010052	BIO	Biopharm	Pharmaceutical Industry	200	25,521,875
DZ0000010060	AOM	AOM Invest	Tourism	100	4,596,030

Source: Prepared by the researchers based on the Algiers Stock Exchange website, available at: <https://www.sgbv.dz/ar/>. Accessed on April 5, 2026.

This resulted in the creation of a balanced data panel consisting of five companies × eight years, i.e., 40 company-year observations; however, this number does not imply the existence of 40 independent units, but rather represents 40 observations distributed across five cross-sectional units over eight years.

3.3. Study Variables and How They Are Measured

Based on the existing literature and the nature of the data available for the companies under study, accounting performance was identified as the dependent variable, while financial structure was represented by a set of financial ratios extracted from the financial statements.

A. Dependent Variable: Accounting Performance

Financial performance is not viewed in this study as a one-dimensional concept, but rather as a concept that can be measured using a set of accounting indicators. Given the nature of the available data and the study's objective regarding the efficient use of resources and assets, the return on assets (ROA) was adopted as an indicator of accounting performance.

This indicator reflects a company's ability to generate profits from the resources it possesses; therefore, it is appropriate for measuring accounting efficiency in the use of assets. However, the use of ROA does not imply that it is a comprehensive measure or a substitute for market performance, as market performance can, in turn, reflect investor expectations and changes in the company's market value.

Accordingly, the use of ROA in this study should be understood as an accounting performance indicator rather than a comprehensive measure of the company's value or its performance in the stock market.

B. Independent Variables: Financial Structure

Financial structure was measured using three indicators: the self-financing ratio, the leverage ratio, and the long-term assets ratio.

- **Self-Financing Ratio (SF):** This ratio measures the extent to which a company relies on its own resources to finance its assets;
- **Leverage Ratio (LR):** Leverage reflects the degree to which a company relies on debt financing relative to its equity; for the purposes of this study, the formula should conform to the theoretical definition used in the literature and the source of the variable, and the formula should be standardized for all companies and years.
- **Long-Term Assets Ratio (LTR):** This ratio measures the relative weight of long-term assets within the company's total assets.

Table 2 illustrates the method used to measure the study variables.

Table 2

Method of Measuring Study Variables

Variable Nature	Code	Name	Calculation Method	Source
Independent Variable	SF	Self-Financing Ratio	Equity / Total Assets	(Trinh et al., 2022)
	LR	Leverage Ratio	Total Debt / Equity	(Bhullar & Gupta, 2017)
	LTR	Long-Term Asset Ratio	Fixed Assets / Total Assets	(Ngoc Minh, 2020)
Dependent Variable	ROA	Return on Assets	Net Income / Total Assets	(Alshammari et al., 2024)

Source: Prepared by the researchers based on relevant previous studies.

3.4. Hypotheses and Research Model

To achieve the study's objectives and address its research question, the following main hypothesis was formulated:

H1: There is a statistically significant positive relationship between the financing structure and the accounting performance of companies listed on the Algiers Stock Exchange during the period 2017–2024.

The following sub-hypotheses stem from this main hypothesis:

There is a statistically significant positive relationship between the equity financing ratio and the return on assets for companies listed on the Algerian stock market;

There is a statistically significant positive relationship between the financial leverage ratio and the return on assets for companies listed on the Algerian stock market;

There is a statistically significant positive relationship between the long-term asset ratio and the return on assets for companies listed on the Algerian stock market.

Based on the theoretical framework and previous studies, a standard model was formulated to test the relationship between financial structure indicators and the accounting performance of the companies under study.

The basic equation takes the following form:

$$ROA = \beta_0 + \beta_1 * SF + \beta_2 * LR + \beta_3 * LAR + \epsilon$$

Where:

ROA: Return on Assets

SF: Equity Ratio

LR: Leverage Ratio

LTR: Long-Term Assets Ratio

$\beta_0, \beta_1, \beta_2, \beta_3$: Estimation coefficients

ε : Random error

3.5. Statistical Analysis Tools Used in the Study

After completing the analysis of the companies' annual financial reports as outlined in the study model, the data was processed to extract the study variables using Excel. The panel data method, which is suitable for this type of study, was applied using the statistical software Eviews 14.SV. The following is an explanation of the statistical methods used in the study:

- Descriptive statistics, calculated by determining the arithmetic mean, standard deviation, maximum value, and minimum value for all study variables, where:
 - Mean: to calculate the average values of the financial structure and accounting performance variables across the companies under study.
 - Standard deviation: to measure the degree of variation of the data around the mean in order to assess the stability of the study variables.
- Normal distribution of the data, through the Skewness and Kurtosis tests and the Shapiro-Wilk test.
- Pearson's correlation coefficient to calculate the correlation among all study variables, determine the nature of the relationship between them, and assess its statistical significance.
- The [Levin et al. \(2002\)](#) unit root test to verify the temporal stability of the study data.
- Testing for linear multicollinearity among the study variables using the VIF and Tolerance tests to determine whether there is multiple linear correlation among the independent variables, which could affect the reliability of the model.
- The test for heteroscedasticity to determine whether the variances of the errors are constant or vary across segments.
- The Hausman test was conducted to select the appropriate model—whether a fixed-effects or random-effects model is most suitable for the analysis.
- Multiple linear regression was performed to examine the simultaneous effect of a set of independent variables on the dependent variable.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics Analysis

[Table 3](#) shows that the return on assets ranges from 0.0665 (the minimum value) to 0.1359 (the maximum value), with an arithmetic mean of 0.0334 and a standard deviation of 0.0469, The results indicate variation in the ROA values, reflecting differences in the financial performance of the companies in the study sample. The standard deviation also indicates significant dispersion in the results, reflecting heterogeneity in the financial performance of these companies.

Table 3

Results of the Descriptive Analysis

Variables	Minimum	Maximum	Mean	Standard Deviation
ROA	-0.0665	0.1359	0.0334	0.0469
SF	0.2712	0.6138	0.4274	0.0974
LR	0.3702	2.6458	1.0042	0.4479
LTR	0.0959	0.9205	0.5554	0.2253

Source: Prepared by the researchers based on the output of the Eviews 14 program

As for the self-financing ratio, it ranges from a minimum of 0.2712 to a maximum of 0.6138, with an arithmetic mean of 0.4274 and a relatively low standard deviation of 0.0974. Based on the results, we can conclude that the companies under study are similar in their external financing policies, as indicated by the relatively low standard deviation, while the arithmetic mean shows that reliance on self-financing was moderate.

The leverage ratio ranges from a minimum of 0.3702 to a maximum of 2.6458, with an arithmetic mean of 1.0042 and a standard deviation of 0.4479. This indicates a variation in reliance on internal and external financing, with a balance between the sources of financing; given the large standard deviation, this suggests that financing policies are not uniform among the companies under study.

As for the ratio of long-term assets, it ranges from 0.0959 as the minimum value to 0.9205 as the maximum value, with an arithmetic mean of 0.5554 and a standard deviation of 0.2253. The results show diversity in investment among the companies, with a preference for long-term assets.

4.2. Test of Normal Distribution

A test of normal distribution was conducted for the study variables, which are presented in the following table.

Table 4

Test of Normal Distribution for the Study Variables

Variables	Skewness	Kurtosis	Shapiro–Wilk	Significance (p-value)
ROA	0.2017	3.1749	0.9522	0.0905
SF	0.4336	2.2727	0.9478	0.0636
LR	1.2763	6.1860	0.8979	0.0017
LTR	-0.5390	2.2979	0.9428	0.0431

Source: Prepared by the researchers based on the output of Eviews 14.

Table 4 shows that the skewness coefficient for the ROA variable recorded a value of 0.2017, which is close to zero, reflecting a slight right-skewness, while the SF variable recorded a value of 0.4336, indicating a limited degree of positive skewness. The LR variable recorded the highest skewness value of 1.2763, indicating a clear positive skew in its distribution, while the LTR variable recorded a negative value of -0.5390, reflecting a limited negative skew.

As for the kurtosis coefficient, its value was 3.1749 for ROA, 2.2727 for SF, 6.1860 for LR and 2.2979 for LTR. It should be noted that the kurtosis value for LR is relatively high compared to the reference value for a normal distribution, which is consistent with the high skewness coefficient and indicates that the distribution of this variable is more concentrated and has sharper tails compared the normal distribution.

As for the Shapiro-Wilk test, the p-value for the ROA variable was approximately 0.0905, and for the SF variable, approximately 0.0636; both are greater than 0.05, allowing us to accept the null hypothesis of a normal distribution at the 5% level.

As for the LR variable, it recorded a p-value of 0.0017, which is less than 0.01, confirming that it does not follow a normal distribution.

As for LTR, its p-value was 0.0431, which is slightly less than 0.05, leading to the rejection of the null hypothesis of normal distribution for this variable.

In general, the results of the normality test do not pose an obstacle to estimating the panel data model used in the study, as the normal distribution of the variables is not a necessary condition for obtaining consistent estimates of the panel model coefficients. However, given the small sample size and the presence of some deviations from the normal distribution—particularly in the LR variable—the reliability of the statistical inference was enhanced by using robust standard errors in the final model.

4.3. Testing the Correlation Among Study Variables

It is evident from the matrix of correlation coefficients among the study variables shown in Table 5 as follows:

There is a strong inverse correlation between the return on assets and the ratio of long-term assets, with a correlation coefficient of 0.7156—which indicates that an increase in investment in long-term assets is accompanied by a decrease in the efficiency of asset utilization in generating profits.

There is a weak negative correlation between the return on assets and the leverage ratio, with a correlation coefficient of 0.1595—indicating that reliance on debt leads to increased costs and thus has a negative impact on performance results.

As for equity financing and return, there is a moderate inverse relationship (0.4124). This indicates that companies' excessive reliance on their own funds to finance their activities may cause them to miss out on the opportunity to generate significant profits.

There is no statistically significant correlation between the independent variables, as the P-values are greater than 0.05.

Table 5

Results of the Correlation Test

		ROA	SF	LR	LTR
ROA	Pearson	1			
	Sig				
SF	Pearson	-0.4124	1		
	Sig	0.000			
LR	Pearson	-0.1595	-0.4519	1	
	Sig	0.001	0.005		
LTR	Pearson	-0.7156	0.4041	0.1536	1
	Sig	0.076	0.000	0.003	

Source: Prepared by the researchers based on the output of Eviews 14

4.4. Testing the Stationarity of the Study Data

Before using cross-sectional time-series data, it is necessary to ensure that the time series used in the model are stationary by testing for the unit root using the statistical test (Levin et al., 2002). Table 6 shows that most of the variables in the study are stationary at the first level, as the P-value is less than 0.05, which supports their direct use in the panel model. However, the LLC results should be interpreted with caution due to the small sample size.

Table 6

Stability Test Results

Variables	Test Statistic	Significance Level (p-value)
ROA	-7.3902	0.0243
SF	-6.6142	0.0074
LR	-3.5314	0.0002
LTR	3.8033	0.0000

Source: Prepared by the researchers based on the output of Eviews 14

4.5. Testing for Linear Interaction Among Independent Variables

Table 7 shows the results of the linear multicollinearity test, indicating that all independent variables fall within statistically acceptable limits, with VIF values ranging from 1.4393 to 1.7661. Consequently, the variance inflation factor (VIF) values are less than 10, and all tolerance values are greater than 0.3055, which confirms that there is no multicollinearity among the independent variables.

Table 7

Results of the Linear Interdependence Test

Independent Variables	Variance Inflation Factor (VIF)	Tolerance
SF	1.7661	0.4338
LR	1.5134	0.3392
LTR	1.4393	0.3055

Source: Prepared by the researchers based on the output of Eviews 14

4.6. Test for Heteroskedasticity

The results of the test for heteroskedasticity across firms, as shown in [Table 8](#), indicate that the p-value for the test was 0.021734, which is less than the significance level of 0.05. This indicates that the null hypothesis—which states that variances are homogeneous across firms—is rejected, and thus there is heteroscedasticity among firms. Meanwhile, the results of the test for heteroscedasticity over time showed that the p-value was 0.002392, which is also less than the significance level of 0.05, indicating the presence of heteroscedasticity across time periods.

Table 8

Results of the Test for Heteroscedasticity

Test Type	Test Statistic	Probability (Prob.)
Modified Wald Test (Groupwise)	13.1816	0.021734
Breusch–Pagan Test	18.4892	0.002392

Source: Prepared by the researchers based on the output of Eviews 14

Given the presence of heteroscedasticity across units (companies), the model was adjusted during estimation using robust standard errors to address this issue, thereby obtaining more accurate results and ensuring the reliability of the significance tests within the study model.

4.7. Estimation Results for the Fixed-Effects Model and the Random-Effects Model

The [Table 9](#) below shows the estimation results for the two models.

Table 9

Estimation Results for the Fixed-Effects and Random-Effects Models

Variable	Fixed-Effects Model			Random-Effects Model		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
SF	-0.2135	-2.590	0.0143	-0.1701	-2.627	0.0126
LR	-0.0558	-3.402	0.0018	-0.0441	-3.120	0.0035
LTR	-0.1496	-2.078	0.0458	-0.1136	-2.925	0.0059

Source: Prepared by the researchers based on the output of Eviews 14

4.8. Hausman Test

To choose between the two models:

The results in [Table 10](#) show that the chi-square (Chi-Sq) value is estimated at 4.9401, and the p-value (P-value) is 0.1762, which is greater than 0.05. Therefore, we accept the null hypothesis and reject the alternative hypothesis, which states that the fixed-effects model is the most appropriate for analyzing the study data, which is consistent with the study by [Arhinful et al. \(2023\)](#), which relied on the “Stata” software in accordance with the fixed-effects and random-effects models, and also used the “Hausman test” to determine the most appropriate method for presenting the study’s results, where it was found that the random-effects model was the most suitable for this purpose.

Table 10

Selection of the Most Appropriate Regression Model

Test Type	Chi-Square (Chi-Sq)	Degrees of Freedom (df)	Probability (Prob.)
Hausman Test	4.9401	3	0.1762

Source: Prepared by the researchers based on the output of Eviews 14

4.9. Final Random Effects Model with Robust Standard Errors

Since the random effects model was found to be the appropriate model, and referring to Table 11, the following can be observed:

- The proposed model is formulated as follows:

$$ROA = 0.2134 - 0.1701*SF - 0.0441*LR - 0.1136*LTR$$

- The Wald test shows that its p-value is 0.0000, which is less than 0.05, indicating that the model as a whole is statistically significant;
 - The explanatory power of the estimated model is high, with a coefficient of determination (R^2) of 0.733, indicating that the independent variables collectively explain 73% of the variation in accounting performance;
 - The results indicated that all independent variables under study have a negative and statistically significant effect. The independent variables were ranked according to their impact on accounting performance as follows:
- ✓ **Equity financing ratio (X1):** For every 1% increase in the equity financing ratio, the return on assets decreases by 0.1701 at a 5% significance level, suggesting that an increase in companies' reliance on equity financing may lead to a decline in accounting performance; This can be explained by the failure to take advantage of the benefits of external financing and financial leverage in maximizing returns. The results of the current study are consistent with the study by Vo & Ellis (2017), which indicated that heavy reliance on internal resources may reflect poor utilization of investment opportunities and inefficient liquidity management, leading to a lower return on assets. A study by Dao and Ta (2020) also supported this argument by confirming that excessive retention of internal funds without effective deployment negatively affects accounting performance;
 - ✓ **Long-Term Assets Ratio (X3):** For every 1% increase in the volume of long-term assets, the return on assets decreases by 0.1136 at a 5% significance level, indicating that an expansion in long-term assets may lead to reduced efficiency in asset utilization and lower returns in the short term. Consequently, the current findings are consistent with a study (Alipour et al., 2015), which showed that an increase in the volume of fixed assets may lead to a decline in operational efficiency and return on assets in the event of underutilization of production capacity. A study by Siddik et al. (2017) also noted that expansion in long-term investments without achieving sufficient returns negatively affects companies' financial performance;
 - ✓ **Leverage ratio (X2):** For every 1% increase in the leverage ratio, the return on assets decreases by 0.0441 at a 5% significance level, indicating that increased reliance on debt leads to a lower return on assets due to increased financial burdens and borrowing costs. The findings of the current study are consistent with a study (Nguyen & Nguyen, 2020), which concluded that high indebtedness leads to a decline in financial performance due to higher financing costs and the risks associated with borrowing. This is also consistent with Le and Phan (2017), which found that excessive debt use negatively affects corporate profitability because it increases financial burdens and reduces financial flexibility.

Table 11

Results of the Random Model Estimation

Variable	Coefficient	Robust S.E	t-Statistic	Probability (p-value)
C	0.21342	0.03360	6.351	0.0000
X1	-0.1701	0.05248	-3.241	0.0026
X2	-0.0441	0.01409	-3.130	0.0035
X3	-0.1136	0.03607	-3.149	0.0033
Model Test / Statistic	Statistic		Probability (p-value)	
Wald $\chi^2(3)$	25.033		0.0000	
R^2	0.733		/	
Number of Observations	40		/	

Source: Prepared by the researchers based on the output of EViews 14

5. CONCLUSION AND RECOMMENDATIONS

Based on 40 panel observations for five companies listed on the Algerian Stock Exchange during the period 2017–2024, the study concluded that the random effects model is the most appropriate according to the Hausman test ($\chi^2=4.940$; $p=0.176$). After addressing heteroskedasticity with robust standard errors, the model as a whole was found to be statistically significant (Wald $\chi^2=25.033$; $p<0.001$). Furthermore, the SF, LR, and LTR coefficients were negative and statistically significant, which contradicts the study by [Javaid et al. \(2024\)](#), which concluded that ownership structure has a significant positive effect on performance. This implies that improved accounting performance in the firms under study is not only linked to increased sources funding, but also to the efficiency of their use, asset structure, and the cost of liabilities; the results remain limited by the small sample size and the short time period.

Based on the findings, the study's hypotheses can be tested as follows:

- ✓ The negative sign of the equity financing coefficient indicates that a higher ratio of equity to assets does not necessarily translate into a direct improvement in return on assets. This may reflect lower efficiency in the use of equity or a higher proportion of non-income-generating assets;
- ✓ The negative effect of leverage suggests that increased reliance on liabilities relative to equity may raise the cost of financing and financial risk, thereby putting pressure on accounting profitability. This result is consistent with the traditional interpretation of leverage, whereby the cost of borrowed funds exceeds the return generated by their use;
- ✓ Furthermore, the negative effect of the long-term asset ratio implies that a higher proportion of long-term assets is associated with a lower return on assets, which can be explained by the slow turnover of these assets, higher depreciation and maintenance costs, or the inefficient utilization of investment capacity during the study period.
- ✓ Consequently, the main hypothesis—which posits a direct relationship with statistical significance between the capital structure and the accounting performance of the firms under study; furthermore, the three sub-hypotheses are rejected, with the emphasis that the direction of the estimated relationship was negative for all independent variables, which is consistent with the study by [Ngoc et al. \(2021\)](#), which concluded that capital structure has a negative effect on operating performance. These results suggest that the effect of financing structure on accounting performance is not merely linked to an increase in sources of financing or the volume of long-term investments, but rather depends to a large extent on the efficiency of resource allocation resources, the cost of financing, and the extent to which companies are able to convert their financial and investment resources into accounting returns.

In light of these findings, the following recommendations can be made:

- Companies listed on the Algerian financial market must focus on the efficient allocation of resources when making decisions regarding their capital structure; an imbalance in the capital structure results in exorbitant financing costs, which in turn leads to a significant decline in both operating profits and net profits for these companies;
- These companies must adopt a specific policy to maintain a balanced financial structure; a balanced capital structure allows for strong control over financing costs, which has a positive impact on the companies' performance indicators; it is essential to adopt an appropriate strategy that ensures this balance; for example, if the debt ratio in the capital structure rises, the company can use the profits earned in a given year to repay creditors; that is, the company may choose to repay debt rather than distribute dividends to shareholders, which leads to a reduction in the debt ratio to some extent and makes the capital structure more balanced. Companies should take such measures periodically to ensure that the capital structure remains balanced and to control the cost of capital, which ultimately leads to improved performance and increased profits;
- Work to improve the efficiency of long-term asset utilization within companies, because poor utilization negatively affects accounting performance even if the financing structure is sound;
- Paying greater attention to the periodic analysis of financial indicators and adopting accurate evaluation tools that help make sound financial decisions supporting improved return on assets and enhancing the efficiency of accounting performance.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement

The data that support the findings of this study are available from the corresponding author, (Aboubaker Khoualed , aboubaker.khoualed@univ-annaba.dz), upon reasonable request.

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Zine Elabidine Othmani: Methodology 20%, Data curation 80%, Validation 85%, Investigation 80%, Writing – review & editing 70%.

Aboubaker Khoualed: Conceptualization 80%, Supervision 100%, Methodology 100%, Validation 100%, Project administration 80%, Writing – review & editing 80%.

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Generative AI declaration statement

The authors declare that no generative artificial intelligence (AI) tools or services were used in the research, writing, analysis, or any other aspect of this work.

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